47, 50, 99

PLAINTIFF'S EXHIBIT

K-1970

IN THE CIRCUIT COURT FOR BALTIMORE CITY

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* ALL CT-1 CASES

* ALL CT-2 CASES

* ALL CT-4 CASES

* ALL CT-5 CASES

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DEFENDANT OWENS-ILLINOIS, INC.'S ANSWERS TO PLAINTIFFS' MASTER INTERROGATORIES TO ALL DEFENDANTS

To: All Defendants, to be answered individually and separately by each Defendant.

Plaintiffs, by their attorneys, John T. Enoch, John Amato, IV, and Goodman, Meagher & Enoch, request Defendants to answer the following Interrogatories. The Interrogatories are to be read and answered in accordance with the following instructions and definitions.

a. These Interrogatories are continuing in character and, in accordance with the Maryland Rules, you are required to supplement your answers promptly after you obtain further material information.

RESPONSE NO. 2: This Defendant objects to this Interrogatory on the basis that it is overly broad and unduly burdensome, and calls for information which is immune from discovery under the attorney work product doctrine.

Without waiving above objections this Defendant states that it has referred to the relevant business records of the Owens-Illinois Glass Company, which are still in the possession of Owens-Illinois, Inc., in connection with the preparation of answers to these Interrogatories unless otherwise indicated.

INTERROGATORY NO. 3: State whether you are a corporation. If so, state: your corporate name; state of incorporation; date of incorporation; address of principal place of business; address(es) of any other place of business; whether, if you are a "foreign corporation" as defined in Maryland General Corporation Law Sec. 1-101(1), you are now or have ever been registered or qualified to do business in the State of Maryland; and the corporate name, state of incorporation and date of incorporation of any subsidiary, predecessor or affiliate corporation.

RESPONSE NO. 3: Owens-Illinois Glass Company was incorporated in the State of Ohio in 1929. Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965. The address of the principal place of business is One SeaGate, Toledo, Ohio 43666.

INTERROGATORY NO. 4: Identify all prior names by which you have existed.

RESPONSE NO. 4: Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965.

(g) The terms and conditions of any contracts or agreements by and between you and such corporation(s) or business entity(ies), including, but not limited to, the terms and conditions relating to the transfer of liabilities for obligations of such corporation(s) or business entity(ies);

(h) Whether you continued the manufacture, sale and/or distribution of such corporation's or business entity's asbestos products and, if so, whether you used the same product name(s) in so doing; and

(i) Whether there was an identity of name, officers, directors, personnel, property, suppliers, distribution outlets and/or clients between you and such corporation(s) or business entity(ies);

RESPONSE NO. 7: Refer to Response No. 6.

INTERROGATORY NO. 8: If you have directly or indirectly mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce asbestos or asbestos-containing products, state as to each such product, indicating separately those products dealt with by you, your predecessor(s) in interest, your subsidiary(ies), and your affiliate(s), if any, the following:

(a) Brand name, trade-name, and/or trade-mark;

(b) The generic name or identity;

(c) Description, including size, shape, color and composition, i.e. solid, powder or other form;

(d) Chemical and physical composition, including, but not limited to, the percentage of asbestos by weight and volume;

(e) Type of asbestos, i.e. chrysotile, amosite, crocidolite, actinolite, anthophyllite, or tremolite, indicating the percentage of each such asbestos fiber by weight and volume;

(f) Intended marketable use; and

(g) Dates during which each asbestos product was mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce.

RESPONSE NO. 8: (a) Kaylo and Kaylo-20;

(b) This Defendant's asbestos-containing products were hydrous calcium silicate materials;

(c) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

(d) This Defendant ceased the manufacture, sale and distribution of its asbestos-containing products in 1958. Its investigation as to the composition of each such product, including the type of asbestos-contained therein (i.e., amosite or chrysotile) and the quantitative percentage of asbestos, is continuing, although this Defendant now believes that this Defendant's commercially produced asbestos-containing products were hydrous calcium silicates containing between 13% and approximately 20% asbestos. Chrysotile asbestos was the primary type apparently used. Amosite was used to a lesser extent.

(f) The asbestos-containing products manufactured by this Defendant were intended to be used for industrial high temperature thermal insulation such as pipe covering and block insulation, and to increase fireproofing and fire protection and for insulation through use as a roof deck or fireproof material or door core material.

(g) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

INTERROGATORY NO. 9: State whether you presently mine, manufacture, produce, fabricate, import, convert, compound, process, sell, merchandise, supply, distribute and/or otherwise place in the stream of commerce any asbestos product(s) listed in your Answer to the preceding interrogatory.

RESPONSE NO. 9: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. It does not now, and it has not since that time, manufactured, sold or distributed any asbestos-containing products.

INTERROGATORY NO. 10: Identify each individual who participated in the design and preparation of manufacturing specifications for each asbestos product identified in your Answer to Interrogatory No. 8.

RESPONSE NO. 10: This Defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 11: State whether any written memoranda, specifications, blueprints or other written materials of any kind or character now exist relating to the design and preparation of the asbestos products identified in your Answer to Interrogatory No. 8. If so, identify:

(a) Each such written material or document; and

(b) The custodian, identity and location of each written material or document.

RESPONSE NO. 11: This defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to Plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 12: Identify, by location and product, each plant of your in which the asbestos products identified in your Answer to Interrogatory No. 8 have been manufactured and/or assembled and the dates said plants have been in operation.

RESPONSE NO. 12: This defendant's manufacturing plants were located in Berlin, New Jersey and Sayreville, New Jersey. The Berlin plant was in operation from approximately 1943 until on or about April 30, 1958. The Sayreville plant was in operation from February, 1948 until about April 30, 1953.

INTERROGATORY NO. 13: If you have discontinued mining, manufacturing, producing, fabricating, importing, converting, compounding, processing, selling, merchandising, supplying, distributing and/or otherwise placing in the stream of commerce any asbestos products listed in your Answer to Interrogatory No. 8, identify the products discontinued, give the date of discontinuance and specify the reason(s) for such discontinuance.

RESPONSE NO. 13: In 1953, this Defendant entered into a sales agreement with Owens-Corning Fiberglas Corporation under which it agreed to the sale of asbestos-containing products to that corporation. This Defendant believes that it ceased the general marketing and sales of its asbestos-containing thermal insulation products at that time, disbanded its sales force, and that thereafter, Owens-Corning Fiberglas Corporation was the primary marketer of its product until the sale of the division to Owens-Corning Fiberglas Corporation in 1958.

INTERROGATORY NO. 14: If you have done so, when did you first determine that any other material could be used in place of asbestos for high-temperature insulation or any other use to or for which asbestos has been applied. If you have, in fact, substituted other material(s) for asbestos in your product(s), then state:

(a) The identity of such substituted material(s);

(b) When the product(s) with such substituted material(s) was first marketed; and

(c) The tradename(s) and brand name(s) of the product(s) marketed with such substituted material(s).

RESPONSE NO. 14: This defendant has located information in its records indicating that several efforts were made to substitute other materials for the asbestos in its Kaylo products; however, such efforts were unsuccessful. Defendant will make available to plaintiffs' counsel through its local counsel reports on such experiments. Some of the reports are contained on microfilm which is old and of poor quality.

INTERROGATORY NO. 20: Identify the distributors of your asbestos products at any time during the period from 1930 to the present and attach copies of all documents relating to said distributors. For each distributor, indicate:

(a) The terms of all assignments, agreements, licenses and other arrangements by and between you and said distributor;

(b) Whether the distribution relationship was exclusive;

(c) The year or years in which the distribution relationship was in effect;

(d) The identity of your asbestos products which the distributor was authorized to and did distribute; and

(e) The quantity of your asbestos products distributed by the distributor on a year-by-year and product-by-product basis.

RESPONSE NO. 20: To the extent that this Interrogatory seeks information for any state other than Maryland, this Defendant objects to this Interrogatory on the basis that it is overbroad and it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

Without waiving the above objection, and insofar as this Interrogatory pertains to Maryland, this Defendant states that McCormick Asbestos Company was a distributor of this Defendant's asbestos-containing products. In 1953, this Defendant entered into a sales agreement with Owens-Corning Fiberglas Corporation under which it agreed to the sale of asbestos-containing products to that corporation. This Defendant believes that it ceased the general marketing and sales of its asbestos-containing thermal insulation products at that time,

disbanded its sales force, and that thereafter, Owens-Corning Fiberglas Corporation was the primary marketer of its products until the sale of the division to Owens-Corning Fiberglas Corporation in 1958, and that these circumstances are the reason that it does not have records or correspondence which would enable it to answer this Interrogatory for the period after 1954.

INTERROGATORY NO. 21: State whether you have ever sold, distributed or otherwise furnished any of your asbestos products to any other person and/or business entity for resale or redistribution at any time from 1930 to the present. If so, state:

(a) The identity of each such person and/or business entity;

(b) The brand name, tradename and/or trademark adopted and used by you for each such product;

(c) The brand name, tradename and/or trademark adopted and used by each such person and/or business entity for each such product;

(d) The generic name or identity of each such product;

(e) The year(s) in which each such product was sold, distributed or otherwise furnished to each such person and/or business entity, and for each year, the quantity of each product sold, distributed or otherwise furnished;

(f) The intended marketable use for each such product;

(g) Whether each such product was intended to be used, resold, or distributed by such other person and/or business entity in the same or substantially the same condition as it was when shipped or delivered by you; and

(h) The custodian, identity and location of all documents pertaining to agreements for the resale, distribution, or furnishing of your asbestos products to each other person and/or business entity.

RESPONSE NO. 21: This Defendant ceased the manufacture, sale and distribution of asbestos-containing thermal insulation products in 1958. This Defendant states that in 1953 it entered into a "Sales Agreement" under which it agreed to sell certain amounts of its asbestos-containing thermal insulation products to Owens-Corning Fiberglas Corporation. Furthermore, this Defendant has found information in its records which indicate that in at least 1956, it placed Owens-Corning Fiberglas Corporation's logo on some of its boxes. This Defendant does not have information sufficient to further respond to this Interrogatory.

INTERROGATORY NO. 22: State the following with respect to the packages and containers in which you sold, distributed or otherwise furnished each of the asbestos products described in your Answer to Interrogatory Nos. 8 and 19 on a year-by-year and product-by-product basis;

(a) A description of the package or container in which each product was sold, distributed or otherwise furnished, including composition, size, shape and color;

(b) A description of the markings or printed material that appeared on each package or container, indicating the size and color of the same;

(c) A description of any logo or other design appearing on the package or container;

(d) A verbatim description of any caution or warning notice appearing on the package or container, setting forth the year(s) in which each such notice appeared on each such product; and

(e) A verbatim description of any instructions appearing on the package or container.

defendant made appropriate efforts to provide ventilation and to control the emissions of all dust emitted during the manufacturing process within recognized save levels of exposure, including the use of respirators in some instances, dust collection equipment and other devices as necessary. Therefore, during the period in which this defendant was in the business of manufacturing Kaylo it had no reason to believe that the foreseeable use of Kaylo would create a hazard to users.

The documents produced by Owens-Corning Fiberglas Corporation indicate that the September, 1955 publication in the A.M.A. Archives of Industrial Health was a publication of inhalation experiments.

To the extent that this interrogatory seeks the production of documents, such documents, as outlined in this response, have not been found as part of this defendant's records and, to the extent that this defendant is in possession of copies of documents, it possesses copies only of documents collected in preparation for litigation. This defendant objects to producing the same. The documents are available from their proper source.

INTERROGATORY NO. 39: Identify all trade organizations, associations or other entities to which you belong or belonged. Said organizations, etc., include, at a minimum, the following:

Asbestos Textile Institute (ATI);

Industrial Hygiene Foundation and/or Industrial Health Foundation (IHF);

Mineral Wool Institute;

Industrial Mineral Insulation Manufacturers Institute;

Magnesia Silica Insulation Manufacturers Association;

National Insulation Manufacturers Association (NIMA);

Thermal Insulation Manufacturers Association (TIMA);

Asbestos Information Association (AIA);

Quebec Asbestos Mining Association (QAMA);

National Safety Council;

Asbestos Cement Producers Association;

Refractories Institute.

RESPONSE NO. 39: This defendant objects to this interrogatory on the grounds that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence except as it relates to the period of time within which this defendant manufactured its asbestos-containing products.

Without waiving the above objection, this defendant states that insofar as this interrogatory refers to associations or organizations of which this defendant was a member during the time when it manufactured asbestos-containing products, it was a member of the Industrial Hygiene Foundation (which changed its name to the Industrial Health Foundation in 1970) for the years 1936 through 1975. This defendant was not a member of any of the other organizations about which this interrogatory inquires.

INTERROGATORY NO. 40: For each trade organization, association or other entity identified in your Answer to Interrogatory No. 39, state:

(c) All documents relating to Saranac Laboratory studies or tests which were received or submitted by you, either directly or indirectly through predecessor(s) in interest, subsidiary(ies) or affiliate(s), if any, through other companies, or through any trade associations, organizations or entities;

(d) All recommendations or findings of such studies in relation to:

(i) adequacy or inadequacy of the threshold limit values;

(ii) the substitution of materials for asbestos; and

(e) The custodian and location of all documents and/or communications identified in your Answer to this Interrogatory.

RESPONSE NO. 45: Refer to response to interrogatory no. 44.

INTERROGATORY NO. 46: State the amount of money spent or contributed by you annually from 1930 to the present for research of the relationship between exposure to asbestos dusts, fibers and/or products and any pulmonary pathology and identify each person or organization to whom the expenditure or contribution was made.

RESPONSE NO. 46: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

INTERROGATORY NO. 47: State whether you have ever maintained a library (or libraries) which contains books, articles, periodicals, journals and/or reference materials that relate to the subjects of asbestos, industrial hygiene, medicine, safety, occupational disease and/or engineering. If so, state:

Exhibit II

(a) The date each such library was established;

(b) The location of each such library;

(c) The identity of each librarian or other person in charge of the operation and materials of each such library;

(d) For whose use each such library was established;

(e) The title, publisher and dates of subscription to or acquisition of each such periodical or journal for each such library; and

(f) The title, author, publisher, date and dates of acquisition of each such article and book for each such library.

RESPONSE NO. 47: During the period of time pertinent to these actions, this defendant did not maintain an entity which would be characterized as an industrial hygiene, medicine, safety and/or engineering library. However, this defendant believes that a separate engineering library may have been maintained by its technical facility. This defendant also states that although it has no records indicating the existence of such a library, upon becoming involved in asbestos-related litigation this defendant listed all the publications which were in its then-existing industrial hygiene library. These publications are listed on **Exhibit II.** This defendant has not yet determined which, if any, of these publications were in this defendant's possession during the time it manufactured, sold and distributed asbestos-containing products.

INTERROGATORY NO. 48: State whether any of the co-defendants in asbestos litigation have ever furnished you with any information as to the state of the medical knowledge at any time regarding the relationship between exposure to asbestos dusts, fibers and/or products and the contracting of diseases, including asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers.

RESPONSE NO. 48: This defendant objects to this interrogatory as being irrelevant and not reasonably calculated to lead to the discovery of admissible evidence and not limited

to any issue which is the subject of this case. This defendant further objects to this interrogatory on the grounds that it seeks information within the work-product privilege and on the ground that it is oppressive and burdensome in that it would have to review all of the files and all of the records of all of its attorneys all over the country to respond to this interrogatory.

INTERROGATORY NO. 49: If your Answer to Interrogatory No. 48 is in the affirmative, identify:

(a) How the information was furnished;

(b) Who furnished said information;

(c) When said information was given to you; and

(d) The substance of said information.

RESPONSE NO. 49: Refer to objections to interrogatory no. 48.

INTERROGATORY NO. 50: State whether, at any time since 1930, you have interchanged, exchanged or communicated, the results of research, tests, studies or experiments regarding the relationship between exposure to asbestos dusts, fibers and/or products and the contracting of diseases, including asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers, with any other person, corporation or other business entity, including co-defendants in this action.

RESPONSE NO. 50: This defendant objects to this interrogatory insofar as it may seek to discover work product of counsel and trial preparation material. Without waiving such objection, this defendant states that it ceased the manufacture, sale and distribution of asbestos-containing products and does not have any records of having interchanged any of the material referred to in this interrogatory with any of the other defendants named in this case; however, this defendant states that defendant Owens-Corning Fiberglas Corporation was entitled

to receive and may have received from this defendant material of the type specified in this interrogatory pursuant to an Agreement dated March 9, 1958 by which this defendant sold the Kaylo Division to Owens-Corning Fiberglas, if in fact this defendant had any material of said type at that time. This defendant's investigation into the subject matter of this interrogatory is continuing.

INTERROGATORY NO. 51: If your Answer to Interrogatory No. 50 is in the affirmative, state:

(a) When said interchanges, exchanges or communications occurred;

(b) The identity of those persons, corporations or business entities who participated in said interchanges, exchanges or communications;

(c) The content of said interchanges, exchanges or communications; and

(d) The identity of the custodian of any documents which relate to said interchanges, exchanges or communications.

RESPONSE NO. 51: Refer to objection and response to interrogatory no. 50.

INTERROGATORY NO. 52: Identify all persons who have testified on your behalf before the Occupational Safety and Health Administration, the National Institute of Occupational Safety and Health, any United States congressional committee, sub-committee, administrative hearing or investigative proceeding on the subjects of the human health consequences of exposure to asbestos dusts, fibers and/or products and the setting, modification, feasibility and acceptance of allegedly safe or proper levels of exposure to said asbestos and asbestos products.

RESPONSE NO. 52: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not

RESPONSE NO. 97: Not applicable. Refer to response to interrogatory no. 96.

INTERROGATORY NO. 98: Identify any and all insurance agreements entered into by and between any person carrying on an insurance business and you which may be available to satisfy part or all of a judgment that might be entered in this action or to indemnify or reimburse you for payments made to satisfy the judgment. As to each such agreement, identify the insurance carrier, the amount of coverage and the applicable dates of coverage.

RESPONSE NO. 98: This defendant objects to this interrogatory on the grounds that it seeks information which is not relevant to the subject matter of this litigation and is not calculated to lead to the discovery of admissible evidence. Without waiving the above objections, this defendant has liability coverage by its insurer, Aetna, for some of the actions brought against it which allegedly result from the use of asbestos-containing products.

INTERROGATORY NO. 99: Describe the method by which you have maintained records concerning the manufacture, sale, advertising, distribution, delivery and installation of each of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19.

RESPONSE NO. 99: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 pursuant to the sale of its Kaylo division to Owens-Corning Fiberglas Corporation on April 30, 1958. It has not found any information in its records pertinent to a record or document retention policy during the period when it manufactured its asbestos-containing products or for the period of years shortly thereafter. In accordance with the contract for the sale of the Kaylo division, in the ordinary course of business

relating to such sale, and because of the production of certain documents by counsel for Owens-Corning Fiberglas Corporation in several jurisdictions involving asbestos-related litigation in the United States, this defendant believes that most of its records pertinent to the Kaylo division were either transferred or made available to the purchaser of the division in 1958. This defendant states that it has not destroyed any documents or records pertaining to the Kaylo division which have been found in its records in 1975 (the year in which this defendant first became aware of asbestos-related actions against it) and thereafter.

INTERROGATORY NO. 100: With regard to the record-keeping method described in your Answer to Interrogatory No. 99, identify:

(a) Each present and former corporate department, division or subdivision responsible for maintaining the records;

(b) How the records are kept, e.g.,in boxes, files, on microfilm, microfiche or computer tape or disk;

(c) The inclusive dates of manufacture, sale, advertising, distribution, delivery and installation that the record keeping system covers;

(d) The location(s) where such records are maintained; and

(e) The identity of each person employed by you at any time from 1930 to the present, in the highest supervisory capacity, who is or was directly responsible for the collection and maintenance of such records.

RESPONSE NO. 100: Refer to response to interrogatory no. 99.

INTERROGATORY NO. 101: If the record keeping system described in your Answer to Interrogatory No. 99 includes use of microfilm, microfiche, computer tape or disk or any other system in which data is taken from other records, state whether you have

AFFIDAVIT

STATE OF OHIO)

)SS:

COUNTY OF LUCAS)

M. F. McCARTHY, being duly sworn according to law, deposes and says that he is an Assistant Secretary of Owens-Illinois, Inc., a defendant herein; that as such he is authorized to make an Affidavit on its behalf; and that the facts set forth in the foregoing DEFENDANT, OWENS-ILLINOIS, INC.'S ANSWERS TO INTERROGATORIES, are true and correct to the best of his knowledge, information and belief.

M. F. McCARTHY

SWORN TO and subscribed before me this 27th day of August, 1987.

Notary Public

My Commission Expires:

BEVERLY A. McNEAR
Notary Public — State of Ohio
My Commission Expires Jan. 29, 1990

IN THE CIRCUIT COURT FOR BALTIMORE CITY

*

* ALL CT-1 CASES

* ALL CT-2 CASES

* ALL CT-4 CASES

* ALL CT-5 CASES

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DEFENDANT OWENS-ILLINOIS, INC.'S ANSWERS TO PLAINTIFFS' MASTER INTERROGATORIES TO ALL DEFENDANTS

To: All Defendants, to be answered individually and separately by each Defendant.

Plaintiffs, by their attorneys, John T. Enoch, John Amato, IV, and Goodman, Meagher & Enoch, request Defendants to answer the following Interrogatories. The Interrogatories are to be read and answered in accordance with the following instructions and definitions.

a. These Interrogatories are continuing in character and, in accordance with the Maryland Rules, you are required to supplement your answers promptly after you obtain further material information.

b. Where knowledge or information of a person is requested or possession or control by a person is inquired of, such request or inquiry includes knowledge, information, possession or control of or by the person's agents, representatives, and, unless privileged, the person's attorneys.

c. When the identity of a natural person is requested, the request or inquiry includes the home address, business address, and his former and present position or job title and business affiliation, and, if the person is a corporation or association, the address of its principal place of business.

d. When the identity of a document is requested, the request or inquiry includes the type or title of the document, its date, its author, and its present custodian. In lieu of identifying any document, a copy may be annexed to the answers to these interrogatories. The term document shall be read to include any paper, graphic material, film, tape, disc, recorded matter, or stored computer data.

e. As used herein, the terms "you" and "your" refer to the defendant corporation answering these interrogatories, its predecessors, parents, subsidiaries and affiliates, if any, its present and former officers, executives, directors, agents and employees, and all other persons acting or purporting to act on behalf of Defendant.

f. Present tense should be construed as also including the past tense where appropriate.

g. The singular should be construed as also including the plural and the plural should be construed as also including the singular where appropriate.

h. If you are unable to answer any of these interrogatories completely, answer to the extent possible, specifically, and state whatever information or knowledge you have concerning the unanswered.

i. As used herein, "asbestos products" and "asbestos-containing products" are inclusive terms, used interchangeably, and include, but are not limited to: asbestos, raw asbestos, mined asbestos, milled asbestos, asbestos compounds, material and products containing asbestos and the asbestos particles, dust and fibers resulting therefrom.

PRELIMINARY STATEMENT

Some of the events which may be relevant to the matters inquired about by Plaintiffs' Interrogatories apparently occurred more than thirty-five years ago. In addition, effective April 30, 1958, Owens-Illinois, Inc. disposed of the business involved in this action by way of sale of that business to Owens-Corning Fiberglas Corporation. Since that time, Owens-Illinois, Inc. has not engaged in any such business. It does not now and it has not since that sale manufactured, distributed or sold any asbestos-containing products. As a result of the foregoing factors, many of the individuals who might have had personal knowledge of the matters to which Plaintiffs' Interrogatories relate are deceased, or are otherwise unavailable to Owens-Illinois, Inc., and

investigations to date indicate that at least some documents which relate to matters inquired about by these Interrogatories may have been transferred to Owens-Corning Fiberglas Corporation with the transfer of the business in question in 1958. Owens-Illinois, Inc. is engaged in a continuing investigation in an attempt to locate, confirm the transfer of, or confirm the absence of, such documents and is also engaged in a continuing investigation into the matters inquired about in these Interrogatories. Unless otherwise stated in an answer to a specific Interrogatory, the answers set out hereinafter are limited to the period during which Owens-Illinois, Inc. manufactured asbestos-containing insulation products and to the facilities related to that business. The following is a part of and is incorporated by reference in every answer provided hereinafter:

> This answer is accurate as of the date made. However, Owens-Illinois, Inc.'s investigation is continuing, and Owens-Illinois, Inc. cannot exclude the possibility that it may be able to obtain more complete information or even information which indicates that the answer being supplied is incorrect. Owens-Illinois, Inc. objects to answering this Interrogatory in regard to any period of time other than the period during which it engaged in the business involved in this case which ended in mid-1958 or concerning any facility not related to that business, on the basis that any such answer would be irrelevant to the subject matter of the pending litigation, would not be reasonably calculated to lead to the discovery of admissible evidence, and would be burdensome and oppressive.

Furthermore, Owens-Illinois, Inc. objects to the instructions and definitions supplied by Plaintiffs with regard to these Interrogatories, on the basis that the definitions are overbroad, vague, and often inconsistent with the normal usage and meaning of such words, and the instructions are overbroad, burdensome and constitute an unreasonable expansion of the Interrogatories themselves. Owens-Illinois, Inc. therefore gives notice that it does not consider itself bound by the instructions and definitions propounded by Plaintiffs, and instead shall answer the Interrogatories in a manner consistent with a normal understanding of the language used in the answer and to the extent necessary to fairly and fully answer the Interrogatory.

PART I - GENERAL INTERROGATORIES

INTERROGATORY NO. 1: State the name, address and official capacity of each person who has supplied information used in answering these interrogatories and indicate for which interrogatory each such person is responsible.

RESPONSE NO. 1: This Defendant states that it has referred to the relevant business records of the Owens-Illinois Glass Company, which are still in the possession of Owens-Illinois, Inc., in connection with the preparation of answers to these Interrogatories unless otherwise indicated.

INTERROGATORY NO. 2: Identify each document that was examined, reviewed and/or used in answering each interrogatory, specify the interrogatory and identify the present custodian of each document.

RESPONSE NO. 2: This Defendant objects to this Interrogatory on the basis that it is overly broad and unduly burdensome, and calls for information which is immune from discovery under the attorney work product doctrine.

Without waiving above objections this Defendant states that it has referred to the relevant business records of the Owens-Illinois Glass Company, which are still in the possession of Owens-Illinois, Inc., in connection with the preparation of answers to these Interrogatories unless otherwise indicated.

INTERROGATORY NO. 3: State whether you are a corporation. If so, state: your corporate name; state of incorporation; date of incorporation; address of principal place of business; address(es) of any other place of business; whether, if you are a "foreign corporation" as defined in Maryland General Corporation Law Sec. 1-101(1), you are now or have ever been registered or qualified to do business in the State of Maryland; and the corporate name, state of incorporation and date of incorporation of any subsidiary, predecessor or affiliate corporation.

RESPONSE NO. 3: Owens-Illinois Glass Company was incorporated in the State of Ohio in 1929. Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965. The address of the principal place of business is One SeaGate, Toledo, Ohio 43666.

INTERROGATORY NO. 4: Identify all prior names by which you have existed.

RESPONSE NO. 4: Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965.

INTERROGATORY NO. 5: If you have divisions which have ever mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce asbestos products, identify each such division and state the names, addresses and job titles of each person who supervised each division, specifying the applicable time periods.

RESPONSE NO. 5: This Defendant does not now and has not in the past engaged in the mining, milling, sale, supply or distribution of asbestos of any type. This Defendant, likewise, does not now and has not in the past engaged in the business of manufacturing, selling, supplying or distributing asbestos-containing textile products, asbestos-containing thermal insulation products, or any asbestos-containing products, except asbestos-containing thermal insulation products in the form of pipe covering and block. Further, this Defendant does not now or has not in the past operated "contract units" or any other entity that installed or contracted to install asbestos-containing products.

Owens-Illinois Glass Company began limited pilot plant operations involving the production of asbestos-containing products in 1943. It began the manufacture of commercial quantities of asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

American Structural Products Company, a wholly owned subsidiary of Owens-Illinois Glass Company, engaged in the manufacture, sale and distribution of asbestos-containing products from about January, 1948 until about June, 1949 when it became the Kaylo Division of Owens-Illinois Glass Company. The Kaylo Division of this Defendant continued to manufacture such

products until about April 30, 1958 when it was purchased by Owens-Corning Fiberglas Corporation from this Defendant effective on that date. As of that time, this Defendant ceased the manufacture and sale of asbestos-containing products, and it has not engaged in any such business since that date.

INTERROGATORY NO. 6: Have you controlled, purchased or in any way acquired any interest in any corporation or business entity which mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce asbestos products?

RESPONSE NO. 6: No, however, Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965.

INTERROGATORY NO. 7: If your Answer to Interrogatory No. 6 is in the affirmative, identify and attach copies of all documents related thereto and state:

(a) The name(s), including prior name(s), and the business address(es) of any and all such corporation(s) or business entity(ies);

(b) The date(s) on which you first controlled, purchased or acquired said interest;

(c) The manner in which you acquired said interest, i.e., cash purchase, merger, consolidation, exchange or sale of assets, etcetera;

(d) The percentage of assets, ownership and/or control acquired by you;

(e) Whether the corporation(s) or business entity(ies) acquired by you continued to exist following the acquisition and, if not, the date on which its existence ceased;

(f) The nature of and/or amount of consideration paid by you for said interest;

(g) The terms and conditions of any contracts or agreements by and between you and such corporation(s) or business entity(ies), including, but not limited to, the terms and conditions relating to the transfer of liabilities for obligations of such corporation(s) or business entity(ies);

(h) Whether you continued the manufacture, sale and/or distribution of such corporation's or business entity's asbestos products and, if so, whether you used the same product name(s) in so doing; and

(i) Whether there was an identity of name, officers, directors, personnel, property, suppliers, distribution outlets and/or clients between you and such corporation(s) or business entity(ies);

RESPONSE NO. 7: Refer to Response No. 6.

INTERROGATORY NO. 8: If you have directly or indirectly mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce asbestos or asbestos-containing products, state as to each such product, indicating separately those products dealt with by you, your predecessor(s) in interest, your subsidiary(ies), and your affiliate(s), if any, the following:

(a) Brand name, trade-name, and/or trade-mark;

(b) The generic name or identity;

(c) Description, including size, shape, color and composition, i.e. solid, powder or other form;

(d) Chemical and physical composition, including, but not limited to, the percentage of asbestos by weight and volume;

(e) Type of asbestos, i.e. chrysotile, amosite, crocidolite, actinolite, anthophyllite, or tremolite, indicating the percentage of each such asbestos fiber by weight and volume;

(f) Intended marketable use; and

(g) Dates during which each asbestos product was mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce.

RESPONSE NO. 8: (a) Kaylo and Kaylo-20;

(b) This Defendant's asbestos-containing products were hydrous calcium silicate materials;

(c) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

(d) This Defendant ceased the manufacture, sale and distribution of its asbestos-containing products in 1958. Its investigation as to the composition of each such product, including the type of asbestos-contained therein (i.e., amosite or chrysotile) and the quantitative percentage of asbestos, is continuing, although this Defendant now believes that this Defendant's commercially produced asbestos-containing products were hydrous calcium silicates containing between 13% and approximately 20% asbestos. Chrysotile asbestos was the primary type apparently used. Amosite was used to a lesser extent.

(f) The asbestos-containing products manufactured by this Defendant were intended to be used for industrial high temperature thermal insulation such as pipe covering and block insulation, and to increase fireproofing and fire protection and for insulation through use as a roof deck or fireproof material or door core material.

(g) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

INTERROGATORY NO. 9: State whether you presently mine, manufacture, produce, fabricate, import, convert, compound, process, sell, merchandise, supply, distribute and/or otherwise place in the stream of commerce any asbestos product(s) listed in your Answer to the preceding interrogatory.

RESPONSE NO. 9: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. It does not now, and it has not since that time, manufactured, sold or distributed any asbestos-containing products.

INTERROGATORY NO. 10: Identify each individual who participated in the design and preparation of manufacturing specifications for each asbestos product identified in your Answer to Interrogatory No. 8.

RESPONSE NO. 10: This Defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 11: State whether any written memoranda, specifications, blueprints or other written materials of any kind or character now exist relating to the design and preparation of the asbestos products identified in your Answer to Interrogatory No. 8. If so, identify:

(a) Each such written material or document; and

(b) The custodian, identity and location of each written material or document.

RESPONSE NO. 11: This defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to Plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 12: Identify, by location and product, each plant of your in which the asbestos products identified in your Answer to Interrogatory No. 8 have been manufactured and/or assembled and the dates said plants have been in operation.

RESPONSE NO. 12: This defendant's manufacturing plants were located in Berlin, New Jersey and Sayreville, New Jersey. The Berlin plant was in operation from approximately 1943 until on or about April 30, 1958. The Sayreville plant was in operation from February, 1948 until about April 30, 1953.

INTERROGATORY NO. 13: If you have discontinued mining, manufacturing, producing, fabricating, importing, converting, compounding, processing, selling, merchandising, supplying, distributing and/or otherwise placing in the stream of commerce any asbestos products listed in your Answer to Interrogatory No. 8, identify the products discontinued, give the date of discontinuance and specify the reason(s) for such discontinuance.

RESPONSE NO. 13: In 1953, this Defendant entered into a sales agreement with Owens-Corning Fiberglas Corporation under which it agreed to the sale of asbestos-containing products to that corporation. This Defendant believes that it ceased the general marketing and sales of its asbestos-containing thermal insulation products at that time, disbanded its sales force, and that thereafter, Owens-Corning Fiberglas Corporation was the primary marketer of its product until the sale of the division to Owens-Corning Fiberglas Corporation in 1958.

INTERROGATORY NO. 14: If you have done so, when did you first determine that any other material could be used in place of asbestos for high-temperature insulation or any other use to or for which asbestos has been applied. If you have, in fact, substituted other material(s) for asbestos in your product(s), then state:

(a) The identity of such substituted material(s);

(b) When the product(s) with such substituted material(s) was first marketed; and

(c) The tradename(s) and brand name(s) of the product(s) marketed with such substituted material(s).

RESPONSE NO. 14: This defendant has located information in its records indicating that several efforts were made to substitute other materials for the asbestos in its Kaylo products; however, such efforts were unsuccessful. Defendant will make available to plaintiffs' counsel through its local counsel reports on such experiments. Some of the reports are contained on microfilm which is old and of poor quality.

Adequate copies may not be made from it, and reading it requires a reader device. Its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 15: State whether you have ever made any changes to or alterations of your asbestos products from 1930 to the present. If so, state:

(a) The identity, by brand name and tradename, of each such product;

(b) The date(s) each such product was changed or altered;

(c) The manner in which each such product was changed or altered, including, but not limited to, any changes in the asbestos content or chemical composition of each such product;

(d) The reason for each change or alteration; and

(e) The identity of the person(s) responsible for instituting each change or alteration.

RESPONSE NO. 15: This Defendant objects to this Interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence, except as it relates to the period of time during which this Defendant engaged in the manufacture, sale and distribution of its asbestos-containing products.

Without waiving its objection this Defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to Plaintiffs' counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires

a reader device. The Defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 16: Do you contend that any of the asbestos products listed in your Answer to Interrogatory No. 8 require change or modification before they may be used? If so, specify what change or modification is required for each such product.

RESPONSE NO. 16: This Defendant objects to this Interrogatory on the grounds that the terms "change" and "modification" are vague and ambiguous. Without waiving its objection, this Defendant states that its asbestos-containing industrial insulation was manufactured in two forms, block and pipe covering. It was a premolded, rigid product which was not intended or required to be molded or mixed in application. It was manufactured in standard premolded shapes and sizes intended to minimize cutting of pieces in application. It appears that the product was applied by methods including gluing, tying, strapping, or wiring it to pipe. It appears that a limited amount of its product was cut during application. Roof deck was intended to be laid on or fastened to building frame members and waterproofed. Core material was intended to be used as a center layer for fire doors.

INTERROGATORY NO. 17: Identify all patents issued, or any applications made therefor, for any asbestos product listed in your Answer to Interrogatory No. 8. Specify the number of each patent, the date(s) of application, issuance and renewal, if applicable, to whom each patent was issued and the product(s) for which each patent was issued.

RESPONSE NO. 17: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. Its investigation as to information concerning any such United States Patents is continuing. However, it appears that the following patents may have been related to this Defendant's asbestos-containing products at one time:

PATENT NO.	INVENTOR	ISSUE DATE
2,425,610	Finley	8-12-47
2,439,724	Finley	4-13-48
RE.23,228	Frasor	5-09-50
2,534,303	Serinis	12-19-51
2,540,354	Selden	2-06-51
2,547,127	Kalousek	4-03-51
2,570,835	Mooney, et al.	10-09-51
2,574,667	Shuman	11-13-51
2,665,996	Kalousek	1-12-54
2,748,008	Kalousek	5-29-56
2,787,345	Soubier, et al.	4-02-57
2,788,304	Scovronek	4-09-57

INTERROGATORY NO. 18: Identify all trademarks registered for any products listed in your Answer to Interrogatory No. 8. Specify the number and date of registration, the term thereof, the date(s) of renewal, if applicable, by whom each trade-mark was registered and the product(s) for which each trade-mark was registered.

RESPONSE NO. 18: Refer to documents attached hereto as Exhibit I.

INTERROGATORY NO. 19: State whether you have distributed or sold any asbestos or asbestos-containing products which was/were mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied and/or otherwise placed in the stream of commerce by persons and/or business entities other than you or your predecessor(s) in interest or subsidiary(ies), if any. If so, state:

(a) The identity of each such person and/or business entity whose asbestos products you sold or distributed on a product-by-product basis;

(b) The terms of all assignments, agreements, licenses and other arrangements which relate to same. Identify and attach copies of all such documents;

(c) As to each product, the brand name, tradename and/or trademark adopted and used by the source from which you obtained said product for distribution or sale;

(d) As to each product, the brand name, tradename and/or trademark adopted and used by you for purposes of distribution or sale of said product;

(e) The generic name or identity of each such product;

(f) The dates during which you distributed or sold each such asbestos product;

(g) As to each such product, a description, including size, shape, color, composition, i.e., solid, powder or other form;

(h) As to each such product, the type of asbestos and the percentage of asbestos, by weight and volume;

(i) As to each such product, its intended marketable use;

(j) The identity of each person and/or business entity in the State of Maryland to whom or to which you sold or distributed each such product;

(k) The identity of each contractor, subcontractor, installer or other business in the State of Maryland which ultimately installed, applied or used each such product; and

(l) The custodian, identity and location of each document which refers to or contains information relevant to such sale or distribution.

RESPONSE NO. 19: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. It presently believes that it did not distribute or sell asbestos-containing insulation products manufactured by another company.

INTERROGATORY NO. 20: Identify the distributors of your asbestos products at any time during the period from 1930 to the present and attach copies of all documents relating to said distributors. For each distributor, indicate:

(a) The terms of all assignments, agreements, licenses and other arrangements by and between you and said distributor;

(b) Whether the distribution relationship was exclusive;

(c) The year or years in which the distribution relationship was in effect;

(d) The identity of your asbestos products which the distributor was authorized to and did distribute; and

(e) The quantity of your asbestos products distributed by the distributor on a year-by-year and product-by-product basis.

RESPONSE NO. 20: To the extent that this Interrogatory seeks information for any state other than Maryland, this Defendant objects to this Interrogatory on the basis that it is overbroad and it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

Without waiving the above objection, and insofar as this Interrogatory pertains to Maryland, this Defendant states that McCormick Asbestos Company was a distributor of this Defendant's asbestos-containing products. In 1953, this Defendant entered into a sales agreement with Owens-Corning Fiberglas Corporation under which it agreed to the sale of asbestos-containing products to that corporation. This Defendant believes that it ceased the general marketing and sales of its asbestos-containing thermal insulation products at that time,

disbanded its sales force, and that thereafter, Owens-Corning Fiberglas Corporation was the primary marketer of its products until the sale of the division to Owens-Corning Fiberglas Corporation in 1958, and that these circumstances are the reason that it does not have records or correspondence which would enable it to answer this Interrogatory for the period after 1954.

INTERROGATORY NO. 21: State whether you have ever sold, distributed or otherwise furnished any of your asbestos products to any other person and/or business entity for resale or redistribution at any time from 1930 to the present. If so, state:

(a) The identity of each such person and/or business entity;

(b) The brand name, tradename and/or trademark adopted and used by you for each such product;

(c) The brand name, tradename and/or trademark adopted and used by each such person and/or business entity for each such product;

(d) The generic name or identity of each such product;

(e) The year(s) in which each such product was sold, distributed or otherwise furnished to each such person and/or business entity, and for each year, the quantity of each product sold, distributed or otherwise furnished;

(f) The intended marketable use for each such product;

(g) Whether each such product was intended to be used, resold, or distributed by such other person and/or business entity in the same or substantially the same condition as it was when shipped or delivered by you; and

(h) The custodian, identity and location of all documents pertaining to agreements for the resale, distribution, or furnishing of your asbestos products to each other person and/or business entity.

RESPONSE NO. 21: This Defendant ceased the manufacture, sale and distribution of asbestos-containing thermal insulation products in 1958. This Defendant states that in 1953 it entered into a "Sales Agreement" under which it agreed to sell certain amounts of its asbestos-containing thermal insulation products to Owens-Corning Fiberglas Corporation. Furthermore, this Defendant has found information in its records which indicate that in at least 1956, it placed Owens-Corning Fiberglas Corporation's logo on some of its boxes. This Defendant does not have information sufficient to further respond to this Interrogatory.

INTERROGATORY NO. 22: State the following with respect to the packages and containers in which you sold, distributed or otherwise furnished each of the asbestos products described in your Answer to Interrogatory Nos. 8 and 19 on a year-by-year and product-by-product basis;

(a) A description of the package or container in which each product was sold, distributed or otherwise furnished, including composition, size, shape and color;

(b) A description of the markings or printed material that appeared on each package or container, indicating the size and color of the same;

(c) A description of any logo or other design appearing on the package or container;

(d) A verbatim description of any caution or warning notice appearing on the package or container, setting forth the year(s) in which each such notice appeared on each such product; and

(e) A verbatim description of any instructions appearing on the package or container.

RESPONSE NO. 22: (a-c, e) This Defendant believes that some of its asbestos-containing insulation products were packaged in corrugated cartons with the trademark Kaylo on the carton. This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and does not have information sufficient to further answer this Interrogatory.

(d) This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This Defendant has not found information in its records sufficient to enable it to answer this Interrogatory. However, it does not appear that any warning concerning asbestos was given in that it does not appear that this Defendant had reason to believe that the use of its products would result in a foreseeable risk of harm.

INTERROGATORY NO. 23: If your Answer to Interrogatory No. 22 reflects that any changes were made to the packages and containers in which you sold, distributed or otherwise furnished each of the asbestos products described in your Answer to Interrogatory Nos. 8 and 19, indicate as to each such package or container:

(a) The nature of each such change, e.g., changes in composition, size, shape and color, and/or changes regarding the placement, modification or removal of any color, logo, design, name, word, number, instruction, warning or other marking on the container;

(b) The date on which you decided to make the change;

(c) The date the container was in fact changed;

(d) The reason for the change;

(e) The identity of each present or former employee, officer, representative or agent of yours at any time from 1930 to the present with knowledge or information regarding your decision to change any aspect of the package or container; and

(f) The custodian, location and identity of each document in your custody, control or possession which contains information relevant to your decision to change any aspect of the package or container.

RESPONSE NO. 23: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This Defendant has not found information in its records sufficient to enable it to answer this Interrogatory.

INTERROGATORY NO. 24: For each asbestos product identified in your Answer to Interrogatory Nos. 8 and 19, as being manufactured, sold, distributed or otherwise furnished by you, state:

(a) Whether you have actual packages or containers or photographs of packages or containers in which said products were sold, distributed or otherwise furnished; and

(b) The identity of the custodian of said packages or containers or photographs thereof.

RESPONSE NO. 24: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This Defendant has not found information in its records sufficient to enable it to answer this Interrogatory.

INTERROGATORY NO. 25: State whether you prepared or published any catalogues, brochures or other documents describing products containing asbestos or asbestos components. If so, identify each such catalogue, brochure or other document and the custodian thereof.

RESPONSE NO. 25: **Refer to Exhibit III.** This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This Defendant has not found information in its records sufficient to enable it to further answer this Interrogatory.

INTERROGATORY NO. 26: Identify each present or former employee, officer, agent or representative of yours who directed, handled, solicited, supervised, promoted or otherwise participated in the sale, supply, distribution, delivery, installation or removal in Maryland, at any time from 1930 to the present, of any asbestos products identified in your Answer to Interrogatory Nos. 8 and 19.

RESPONSE NO. 26: This Defendant objects to this Interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

INTERROGATORY NO. 27: For each person identified in your Answer to Interrogatory No. 26 who participated in the advertising in Maryland of any asbestos products identified in Interrogatory Nos. 8 and 19 at any time from 1930 to the present, state:

(a) His or her duties, responsibilities and inclusive years of employment;

(b) The identity of each product advertised, marketed or promoted; and

(c) The method by which each product was advertised, marketed or promoted, and if by print, the name of the publication, the inclusive dates during which the advertisement or promotion appeared therein and the publisher.

RESPONSE NO. 27: This Defendant objects to this Interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

INTERROGATORY NO. 28: Describe your corporate structure and policy concerning the subject of employee safety in the design, development, manufacture, testing and use of asbestos products identified in your Answer to Interrogatory Nos. 8 and 19 from 1930 to the present. In your Answer to this Interrogatory, identify each present or former corporate department, division, subdivision or other group responsible for the above-described activities and, with respect to each, identify the name, title, duties, responsibilities, and current or last known business and residential address of the highest supervisory employee with knowledge of any of those activities during any time from 1930 to the present.

RESPONSE NO. 28: This Defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to Plaintiffs' counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This Defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 29: Describe your corporate structure concerning the subject of research and development of asbestos products identified in your Answer to Interrogatory Nos. 8 and 19 from 1930 to the present. In your Answer to this Interrogatory, identify each present or former corporate department, division, subdivision or other group responsible for any of these activities and, with respect to each, identify the name, title, duties, responsibilities, and current or last known business and residential address of the highest supervisory employee during any time from 1930 to the present.

RESPONSE NO. 29: This Defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to Plaintiffs' counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This Defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 30: Describe your corporate structure concerning medical directors, industrial hygienists or consultants in these fields from 1930 to the present. In your Answer to this Interrogatory, identify the name, title, duties, responsibilities, period of employment, to whom the individual reported, and the current or last known business and residential address of each medical director, industrial hygienist or consultant of yours, or of your predecessor(s) in interest or subsidiary(ies), if any.

RESPONSE NO. 30: This Defendant objects to this Interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence, except as it relates to the period of time during which this Defendant engaged in the manufacture, sale and distribution of its asbestos-containing products. Without waiving its objection, Defendant states that the following individuals acted as chief medical officers from the date when Defendant first manufactured asbestos-containing products until the present time. Charles Shook, M.D., deceased, employed from March 25, 1946 until June 30, 1960 was the Medical Director during the period in which this Defendant manufactured, sold or distributed asbestos-

containing products. This Defendant's chief medical officer is responsible for assuring and promoting preventive and corrective medical programs, services and practices to protect and preserve employee health and productivity throughout Owens-Illinois, Inc. The individual in this position develops, organizes, introduces and implements pre-employment and periodic examinations as well as new health programs in order to insure the continued well-being of Defendant's employees in a safe and healthful environment. The person in this position is also responsible for the quality of medical services at Owens-Illinois locations. W.G. Hazard was employed as this Defendant's industrial hygienist during the period of time in which this Defendant engaged in the manufacture, sale and distribution of asbestos-containing products. Mr. Hazard has retired from this Defendant's employ and currently resides at 3609 Mapleway Drive, Toledo, Ohio 43614. This Defendant objects to further answering this Interrogatory on the grounds that it seeks information not relevant to the subject matter of this litigation and not reasonably calculated to lead to the discovery of admissible evidence except as it relates to the period of time within which this Defendant manufactured its asbestos-containing products. This Defendant has no records which describe the precise duties and responsibilities of its industrial hygienist during the time when it manufactured its asbestos-containing products, nor is its industrial hygienist currently an employee of this Defendant. However, Defendant believes that the industrial hygienist was responsible for the health aspects of employee working environments.

INTERROGATORY NO. 31: Identify any medical examination program offered or sponsored by you or your insurance carrier, from 1930 to the present, for employees handling or otherwise exposed to asbestos and/or asbestos products. With respect to each such program, indicating applicable time periods, state:

(a) The manner of communicating with employees about such program;

(b) Whether examination was optional or mandatory and, if the latter, how frequently such examination was required;

(c) What percentage of employees permitted to undergo such examination actually participated;

(d) What percentage of employees who underwent such medical examination were found to have pneumoconiosis, asbestosis, mesothelioma, lung cancer or other cancers; and

(e) With respect to the employees referred to in your Answer to Part (d) of this Interrogatory, what percentage of these employees were paid disability, and/or worker's compensation benefits and for what percentage of employees were medical expenses paid for purposes of treatment of such condition.

RESPONSE NO. 31: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and does not have any records from which it can obtain information sufficient to answer this interrogatory.

During May, 1979, various papers and reports were produced by an employee of the Trudeau Institute, Mr. Allan Logie, regarding animal experiments conducted at laboratories at Saranac Lake involving dust collected during the Kaylo manufacturing process. These papers and reports may contain information relating to the substance of this interrogatory. The employee, Mr. Logie, had no personal knowledge about the course or conduct of any such experiments, the preparation of papers and reports he produced or the retention or completeness of those

papers and reports. Therefore, he could not authenticate these papers and reports. This defendant has not been able to find these papers and reports in its business records or correspondence although it has searched for and continues to search for them.

This defendant's counsel obtained copies of some of the papers and reports produced by Mr. Logie. However, these copies constitute only a portion of a larger volume of papers and reports which this defendant has not copied. They are available at Milbank, Tweed, Hadley & McCloy, One Chase Manhattan Plaza, New York, New York. This defendant also has reason to believe that plaintiffs' counsel has copies of the documents produced by Mr. Logie. Other documents possibly relating to this interrogatory may have been produced by Owens-Corning Fiberglas Corporation.

Those documents found at Saranac Lake and at Owens-Corning Fiberglas Corporation and elsewhere, which this defendant cannot authenticate, indicate that during the period of time when Owens-Illinois was in the business of manufacturing asbestos-containing products, those products contained a relatively small proportion of asbestos. The inhalation of asbestos dust in excessive amounts over a prolonged period of time (years), under certain conditions, could lead to the potential hazard to factory workers of contracting a disease known as asbestosis. Those documents further indicate that the asbestos dust produced in the manufacture of Kaylo apparently could lead to this potential hazard where exposures were in excess of recognized safe limits,

that plant workers were not exposed to levels above the recognized safe limits that users were not exposed to dust levels above the recognized safe limits, and that Kaylo plant employees were x-rayed annually and displayed no asbestos-related chest disease. From the foregoing documents, it further appears that this defendant made appropriate efforts to provide ventilation and to control the emissions of all dust emitted during the manufacturing process within recognized save levels of exposure, including the use of respirators in some instances, dust collection equipment and other devices as necessary. Therefore, during the period in which this defendant was in the business of manufacturing Kaylo it had no reason to believe that the foreseeable use of Kaylo would create a hazard to users.

The documents produced by Owens-Corning Fiberglas Corporation indicate that the September, 1955 publication in the A.M.A. Archives of Industrial Health was a publication of inhalation experiments.

INTERROGATORY NO. 32: State whether you or anyone on your behalf ever conducted, engaged in or participated in any tests, studies and/or research, concerning the human health consequences of persons coming in contact with and/or inhaling asbestos fibers or asbestos dust during the manufacture and/or use of asbestos products. If so, identify:

(a) What tests, studies and/or research were done;

(b) When said tests, studies and/or research were done;

(c) The individuals who ordered and supervised the tests, studies and/or research;

(d) The individuals or groups engaged in or participating in the tests, studies and/or research;

(e) The substance of any recommendations and/or suggestions given as a result of the tests, studies or research. State when, by whom and to whom said recommendations were made, including the addresses of these individuals;

(f) All written documents including, but not limited to, reports, memoranda, specifications and correspondence which refer, relate or pertain to said tests, studies and/or research; and

(g) The present custodian of the written documents identified in your Answer to Part (f) of this Interrogatory.

RESPONSE NO. 32: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and does not have any records from which it can obtain information sufficient to answer this interrogatory.

During May, 1979, various papers and reports were produced by an employee of the Trudeau Institute, Mr. Allan Logie, regarding animal experiments conducted at laboratories at Saranac Lake involving dust collected during the Kaylo manufacturing process. These papers and reports may contain information relating to the substance of this interrogatory. The employee, Mr. Logie, had no personal knowledge about the course or conduct of any such experiments, the preparation of papers and reports he produced or the retention or completeness of those papers and reports. Therefore, he could not authenticate these papers and reports. This defendant has not been able to find these papers and reports in its business records or correspondence although it has searched for and continues to search for them.

This defendant's counsel obtained copies of some of the papers and reports produced by Mr. Logie. However, these copies constitute only a portion of a larger volume of papers and reports which this defendant has not copied. They are available at Milbank, Tweed, Hadley & McCloy, One Chase Manhattan Plaza, New York, New York. This defendant also has reason to believe that plaintiffs' counsel has copies of the documents produced by Mr. Logie. Other documents possibly relating to this interrogatory may have been produced by Owens-Corning Fiberglas Corporation.

To the extent that this interrogatory seeks the production of documents, such documents, as outlined in this response, have not been found as part of this defendant's records and, to the extent that this defendant is in possession of copies of documents, it possesses copies only of documents collected in preparation for litigation. This defendant objects to producing the same. The documents are available from their proper source.

INTERROGATORY NO. 33: State whether any of the medical directors, industrial hygienists or consultants in these fields identified in your Answer to Interrogatory No. 30 ever made any recommendations and/or suggestions to you pertaining to the risks or hazards to persons involved in the manufacture or use of asbestos products. If so, identify:

(a) The date when said recommendations and/or suggestions were made;

(b) The individual to whom said recommendations and/or suggestions were made;

(c) The individual who made said recommendations and/or suggestions;

(d) The substance of the recommendations and/or suggestions; and

(e) What actions, if any, were taken by you as a result of said recommendations and/or suggestions.

RESPONSE NO. 33: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 34: State whether you have ever conducted or directed any studies to determine the amount of asbestos dust in your asbestos product manufacturing facilities. If so, identify:

(a) The date of each such study;

(b) The individual or group conducting each such study;

(c) The result or conclusion of each such study;

(d) All documents which refer, relate or pertain to each such study; and

(e) The present custodian of all documents identified in your Answer to Part (d) of this Interrogatory.

RESPONSE NO. 34: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 35: State whether any written memoranda, specification, blueprints or other written materials of any kind or character exist relating to any testing of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19. If so, identify:

(a) Each such written material or document; and

(b) The custodian, identity and location of each such written material or document.

RESPONSE NO. 35: This defendant has in its records technical reports relating to the development and testing of Kaylo, and Will make available to plaintiffs' counsel through its

local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this interrogatory is continuing.

INTERROGATORY NO. 36: State whether, after you released to the public any of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19, you ever conducted or directed any tests thereon to determine potential health hazards involved in the use of the materials.

RESPONSE NO. 36: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and does not have any records from which it can obtain information sufficient to answer this interrogatory.

During May, 1979, various papers and reports were produced by an employee of the Trudeau Institute, Mr. Allan Logie, regarding animal experiments conducted at laboratories at Saranac Lake involving dust collected during the Kaylo manufacturing process. These papers and reports may contain information relating to the substance of this interrogatory. The employee, Mr. Logie, had no personal knowledge about the course or conduct of any such experiments, the preparation of papers and reports he produced or the retention or completeness of those papers and reports. Therefore, he could not authenticate these papers and reports. This defendant has not been able to find these papers and reports in its business records or correspondence although it has searched for and continues to search for them.

This defendant's counsel obtained copies of some of the papers and reports produced by Mr. Logie. However, these copies constitute only a portion of a larger volume of papers and reports which this defendant has not copied. They are available at Milbank, Tweed, Hadley & McCloy, One Chase Manhattan Plaza, New York, New York. This defendant also has reason to believe that plaintiffs' counsel has copies of the documents produced by Mr. Logie. Other documents possibly relating to this interrogatory may have been produced by Owens-Corning Fiberglas Corporation.

Those documents found at Saranac Lake and at Owens-Corning Fiberglas Corporation and elsewhere, which this defendant cannot authenticate, indicate that during the period of time when Owens-Illinois was in the business of manufacturing asbestos-containing products, those products contained a relatively small proportion of asbestos. The inhalation of asbestos dust in excessive amounts over a prolonged period of time (years), under certain conditions, could lead to the potential hazard to factory workers of contracting a disease known as asbestosis. Those documents further indicate that the asbestos dust produced in the manufacture of Kaylo apparently could lead to this potential hazard where exposures were in excess of recognized safe limits, that plant workers were not exposed to levels above the recognized safe limits that users were not exposed to dust levels above the recognized safe limits, that Kaylo plant employees were x-rayed annually and displayed no asbestos-related chest disease. From the foregoing documents, it further appears that this

defendant made appropriate efforts to provide ventilation and to control the emissions of all dust emitted during the manufacturing process within recognized save levels of exposure, including the use of respirators in some instances, dust collection equipment and other devices as necessary. Therefore, during the period in which this defendant was in the business of manufacturing Kaylo it had no reason to believe that the foreseeable use of Kaylo would create a hazard to users.

The documents produced by Owens-Corning Fiberglas Corporation indicate that the September, 1955 publication in the A.M.A. Archives of Industrial Health was a publication of inhalation experiments.

To the extent that this interrogatory seeks the production of documents, such documents, as outlined in this response, have not been found as part of this defendant's records and, to the extent that this defendant is in possession of copies of documents, it possesses copies only of documents collected in preparation for litigation. This defendant objects to producing the same. The documents are available from their proper source.

INTERROGATORY NO. 37: State whether, prior to 1970, you ever had any labor inspectors or persons from your company go to job sites or other areas where your asbestos products were being used or installed to make a dust level count. If so, indicate when such a practice or procedure began, the purpose of the practice or procedure and what action, if any, was taken by you in response to the findings made as a result of said practice or procedure.

RESPONSE NO. 37: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 38: State whether you ever conducted or directed any studies designed to learn how to minimize or eliminate the inhalation and ingestion of asbestos dust and fibers by those who use your asbestos products or are exposed to asbestos dust or fibers therefrom.

RESPONSE NO. 38: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and does not have any records from which it can obtain information sufficient to answer this interrogatory.

During May, 1979, various papers and reports were produced by an employee of the Trudeau Institute, Mr. Allan Logie, regarding animal experiments conducted at laboratories at Saranac Lake involving dust collected during the Kaylo manufacturing process. These papers and reports may contain information relating to the substance of this interrogatory. The employee, Mr. Logie, had no personal knowledge about the course or conduct of any such experiments, the preparation of papers and reports he produced or the retention or completeness of those papers and reports. Therefore, he could not authenticate these papers and reports. This defendant has not been able to find these papers and reports in its business records or correspondence although it has searched for and continues to search for them.

This defendant's counsel obtained copies of some of the papers and reports produced by Mr. Logie. However, these copies constitute only a portion of a larger volume of papers and reports which this defendant has not copied. They are available at Milbank, Tweed, Hadley & McCloy, One Chase Manhattan Plaza, New York, New York. This defendant also has reason to believe that plaintiffs' counsel has copies of the documents produced by Mr. Logie. Other documents possibly relating to this interrogatory may have been produced by Owens-Corning Fiberglas Corporation.

Those documents found at Saranac Lake and at Owens-Corning Fiberglas Corporation and elsewhere, which this defendant cannot authenticate, indicate that during the period of time when Owens-Illinois was in the business of manufacturing asbestos-containing products, those products contained a relatively small proportion of asbestos. The inhalation of asbestos dust in excessive amounts over a prolonged period of time (years), under certain conditions, could lead to the potential hazard to factory workers of contracting a disease known as asbestosis. Those documents further indicate that the asbestos dust produced in the manufacture of Kaylo apparently could lead to this potential hazard where exposures were in excess of recognized safe limits, that plant workers were not exposed to levels above the recognized safe limits that users were not exposed to dust levels above the recognized safe limits, that Kaylo plant employees were x-rayed annually and displayed no asbestos-related chest disease. From the foregoing documents, it further appears that this

defendant made appropriate efforts to provide ventilation and to control the emissions of all dust emitted during the manufacturing process within recognized save levels of exposure, including the use of respirators in some instances, dust collection equipment and other devices as necessary. Therefore, during the period in which this defendant was in the business of manufacturing Kaylo it had no reason to believe that the foreseeable use of Kaylo would create a hazard to users.

The documents produced by Owens-Corning Fiberglas Corporation indicate that the September, 1955 publication in the A.M.A. Archives of Industrial Health was a publication of inhalation experiments.

To the extent that this interrogatory seeks the production of documents, such documents, as outlined in this response, have not been found as part of this defendant's records and, to the extent that this defendant is in possession of copies of documents, it possesses copies only of documents collected in preparation for litigation. This defendant objects to producing the same. The documents are available from their proper source.

INTERROGATORY NO. 39: Identify all trade organizations, associations or other entities to which you belong or belonged. Said organizations, etc., include, at a minimum, the following:

Asbestos Textile Institute (ATI);

Industrial Hygiene Foundation and/or Industrial Health Foundation (IHF);

Mineral Wool Institute;

Industrial Mineral Insulation Manufacturers Institute;

Magnesia Silica Insulation Manufacturers Association;

National Insulation Manufacturers Association (NIMA);

Thermal Insulation Manufacturers Association (TIMA);

Asbestos Information Association (AIA);

Quebec Asbestos Mining Association (QAMA);

National Safety Council;

Asbestos Cement Producers Association;

Refractories Institute.

RESPONSE NO. 39: This defendant objects to this interrogatory on the grounds that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence except as it relates to the period of time within which this defendant manufactured its asbestos-containing products.

Without waiving the above objection, this defendant states that insofar as this interrogatory refers to associations or organizations of which this defendant was a member during the time when it manufactured asbestos-containing products, it was a member of the Industrial Hygiene Foundation (which changed its name to the Industrial Health Foundation in 1970) for the years 1936 through 1975. This defendant was not a member of any of the other organizations about which this interrogatory inquires.

INTERROGATORY NO. 40: For each trade organization, association or other entity identified in your Answer to Interrogatory No. 39, state:

(a) Dates of membership;

(b) Type of membership, i.e., regular or associate;

(c) The dates and type of meetings you attended and the identity of the individuals who attended such meetings on your behalf;

(d) The identity, title, duties and responsibilities of any individual who held an elected, appointed or self-designated position within said organization, etc.;

(e) The names of any publications or written materials distributed by or on behalf of said organization, etc.; and

(f) The identity of the present custodian of all written materials, notes, summaries, minutes or transcripts relating to the transactions and proceedings of said organization, etc.;

RESPONSE NO. 40: Refer to response to interrogatory no. 39.

INTERROGATORY NO. 41: For each trade organization, association or other entity identified in your Answer to Interrogatory No. 39, identify all studies, tests, research, recommendations, suggestions, seminars, symposia and/or speeches conducted or made which concerned, discussed, addressed or dealt with the actual, alleged or possible health hazards associated with exposure to asbestos.

RESPONSE NO. 41: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence, except as it relates to the period of time during which this defendant engaged in the manufacture, sale and distribution of its asbestos-containing products. Without waiving its objection, defendant states that it has not found any information in its records sufficient to answer this interrogatory.

INTERROGATORY NO. 42: With respect to each study, test, research project recommendation, suggestion, seminar, symposium or speech identified in your Answer to Interrogatory No. 41, identify:

(a) The individuals or groups involved therein;

(b) The date(s) thereof;

(c) The complete results thereof;

(d) The recommendations, if any, which were made as a result thereof; and

(e) The custodian, identity and location of each document which represents, refers to or contains information relating thereto.

RESPONSE NO. 42: Refer to objection to interrogatory no. 41.

INTERROGATORY NO. 43: Describe each action taken by you as a result of each study, test, research project, recommendation, suggestion, seminar, symposium and/or speech identified in your Answer to Interrogatory No. 41. In your Answer to this Interrogatory, state the date of each action and the identity of the individual(s) who initiated said action.

RESPONSE NO. 43: Refer to objection to interrogatory no. 41.

INTERROGATORY NO. 44: State whether you directed, sponsored, financed, participated in or received the results of any studies and/or tests performed by the Saranac Laboratory of the Trudeau Foundation concerning the human health consequences of exposure to asbestos.

RESPONSE NO. 44: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and does not have any records from which it can obtain information sufficient to answer this interrogatory.

During May, 1979, various papers and reports were produced by an employee of the Trudeau Institute, Mr. Allan Logie, regarding animal experiments conducted at laboratories at

Saranac Lake involving dust collected during the Kaylo manufacturing process. These papers and reports may contain information relating to the substance of this interrogatory. The employee, Mr. Logie, had no personal knowledge about the course or conduct of any such experiments, the preparation of papers and reports he produced or the retention or completeness of those papers and reports. Therefore, he could not authenticate these papers and reports. This defendant has not been able to find these papers and reports in its business records or correspondence although it has searched for and continues to search for them.

This defendant's counsel obtained copies of some of the papers and reports produced by Mr. Logie. However, these copies constitute only a portion of a larger volume of papers and reports which this defendant has not copied. They are available at Milbank, Tweed, Hadley & McCloy, One Chase Manhattan Plaza, New York, New York. This defendant also has reason to believe that plaintiffs' counsel has copies of the documents produced by Mr. Logie. Other documents possibly relating to this interrogatory may have been produced by Owens-Corning Fiberglas Corporation.

INTERROGATORY NO. 45: If your Answer to Interrogatory No. 44 is in the affirmative, identify:

(a) All documents in your possession or control which summarize or explain the results of said studies or tests;

(b) All communications, oral or written, between you and Saranac Laboratory personnel, including but not limited to Gerrit W. Schepers, M.D.;

(c) All documents relating to Saranac Laboratory studies or tests which were received or submitted by you, either directly or indirectly through predecessor(s) in interest, subsidiary(ies) or affiliate(s), if any, through other companies, or through any trade associations, organizations or entities;

(d) All recommendations or findings of such studies in relation to:

(i) adequacy or inadequacy of the threshold limit values;

(ii) the substitution of materials for asbestos; and

(e) The custodian and location of all documents and/or communications identified in your Answer to this Interrogatory.

RESPONSE NO. 45: Refer to response to interrogatory no. 44.

INTERROGATORY NO. 46: State the amount of money spent or contributed by you annually from 1930 to the present for research of the relationship between exposure to asbestos dusts, fibers and/or products and any pulmonary pathology and identify each person or organization to whom the expenditure or contribution was made.

RESPONSE NO. 46: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

INTERROGATORY NO. 47: State whether you have ever maintained a library (or libraries) which contains books, articles, periodicals, journals and/or reference materials that relate to the subjects of asbestos, industrial hygiene, medicine, safety, occupational disease and/or engineering. If so, state:

Exhibit II

(a) The date each such library was established;

(b) The location of each such library;

(c) The identity of each librarian or other person in charge of the operation and materials of each such library;

(d) For whose use each such library was established;

(e) The title, publisher and dates of subscription to or acquisition of each such periodical or journal for each such library; and

(f) The title, author, publisher, date and dates of acquisition of each such article and book for each such library.

RESPONSE NO. 47: During the period of time pertinent to these actions, this defendant did not maintain an entity which would be characterized as an industrial hygiene, medicine, safety and/or engineering library. However, this defendant believes that a separate engineering library may have been maintained by its technical facility. This defendant also states that although it has no records indicating the existence of such a library, upon becoming involved in asbestos-related litigation this defendant listed all the publications which were in its then-existing industrial hygiene library. These publications are listed on **Exhibit II.** This defendant has not yet determined which, if any, of these publications were in this defendant's possession during the time it manufactured, sold and distributed asbestos-containing products.

INTERROGATORY NO. 48: State whether any of the co-defendants in asbestos litigation have ever furnished you with any information as to the state of the medical knowledge at any time regarding the relationship between exposure to asbestos dusts, fibers and/or products and the contracting of diseases, including asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers.

RESPONSE NO. 48: This defendant objects to this interrogatory as being irrelevant and not reasonably calculated to lead to the discovery of admissible evidence and not limited

to any issue which is the subject of this case. This defendant further objects to this interrogatory on the grounds that it seeks information within the work-product privilege and on the ground that it is oppressive and burdensome in that it would have to review all of the files and all of the records of all of its attorneys all over the country to respond to this interrogatory.

INTERROGATORY NO. 49: If your Answer to Interrogatory No. 48 is in the affirmative, identify:

(a) How the information was furnished;

(b) Who furnished said information;

(c) When said information was given to you; and

(d) The substance of said information.

RESPONSE NO. 49: Refer to objections to interrogatory no. 48.

INTERROGATORY NO. 50: State whether, at any time since 1930, you have interchanged, exchanged or communicated, the results of research, tests, studies or experiments regarding the relationship between exposure to asbestos dusts, fibers and/or products and the contracting of diseases, including asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers, with any other person, corporation or other business entity, including co-defendants in this action.

RESPONSE NO. 50: This defendant objects to this interrogatory insofar as it may seek to discover work product of counsel and trial preparation material. Without waiving such objection, this defendant states that it ceased the manufacture, sale and distribution of asbestos-containing products and does not have any records of having interchanged any of the material referred to in this interrogatory with any of the other defendants named in this case; however, this defendant states that defendant Owens-Corning Fiberglas Corporation was entitled

to receive and may have received from this defendant material of the type specified in this interrogatory pursuant to an Agreement dated March 9, 1958 by which this defendant sold the Kaylo Division to Owens-Corning Fiberglas, if in fact this defendant had any material of said type at that time. This defendant's investigation into the subject matter of this interrogatory is continuing.

INTERROGATORY NO. 51: If your Answer to Interrogatory No. 50 is in the affirmative, state:

(a) When said interchanges, exchanges or communications occurred;

(b) The identity of those persons, corporations or business entities who participated in said interchanges, exchanges or communications;

(c) The content of said interchanges, exchanges or communications; and

(d) The identity of the custodian of any documents which relate to said interchanges, exchanges or communications.

RESPONSE NO. 51: Refer to objection and response to interrogatory no. 50.

INTERROGATORY NO. 52: Identify all persons who have testified on your behalf before the Occupational Safety and Health Administration, the National Institute of Occupational Safety and Health, any United States congressional committee, sub-committee, administrative hearing or investigative proceeding on the subjects of the human health consequences of exposure to asbestos dusts, fibers and/or products and the setting, modification, feasibility and acceptance of allegedly safe or proper levels of exposure to said asbestos and asbestos products.

RESPONSE NO. 52: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not

reasonably calculated to lead to the discovery of admissible evidence. Without waiving its objection, this defendant states that no such testimony has been given.

INTERROGATORY NO. 53: Identify all documents presented to or utilized in the preparation of testimony before the organizations, agencies or committees referred to in Interrogatory No. 52, specifying which documents were presented or utilized for each such body and the present custodian and location of each document.

RESPONSE NO. 53: Not applicable. Refer to objection and response to interrogatory no. 52.

INTERROGATORY NO. 54: For all testimony or presentations identified in your Answer to Interrogatory No. 52, identify:

(a) The dates and descriptions of the hearings and proceedings;

(b) The relationship between the person who testified or responded and you; and

(c) All studies, test results, scientific and/or medical documents relied upon by each person as the basis for any recommendation made or testimony given;

RESPONSE NO. 54: Not applicable. Refer to objection and response to interrogatory no. 52.

INTERROGATORY NO. 55: State your knowledge relating to the meaning of "threshold limit value" as it pertains to asbestos exposure and disease.

RESPONSE NO. 55: This defendant understands the term "threshold limit value" as it pertains to the asbestos trade to mean the maximum average atmospheric concentration of asbestos dust to which workers may be exposed for an eight hour day without injury to health. During the period of time this defendant manufactured, sold and distributed asbestos-containing products, the threshold limit value for asbestos dust, as taken

from the published transactions and other material of the American Conference of Governmental and Industrial Hygienists was 5,000,000 particles of asbestos dust per cubic foot of air.

INTERROGATORY NO. 56: With reference to "threshold limit value" (which, for purposes of this interrogatory, means how much asbestos dust and/or fibers one can safely inhale, absorb or ingest without risk of disease or illness), state:

(a) When and by what means you obtained information related thereto;

(b) The substance of any information imparted to you regarding the same; and

(c) Whether and by what means you advised or warned anyone of details relating thereto.

RESPONSE NO. 56: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. It has not located information in its records that would enable it to answer this interrogatory. However, it appears that this defendant was aware of the TLV for asbestos dust and other dusts as published by the American Conference of Governmental Industrial Hygienists (ACGIH) in the mid- to late-1940s or 1950s.

During the 1940s and after, it appears that an employee of this defendant subscribed to and received the Journal of Industrial Hygiene and Toxicology which contained, in 1946, an article entitled "A Health Survey of Pipe Covering Operations in Constructing Naval Vessels," by Fleischer, Drinker and others which discusses safe levels of asbestos. Also, this defendant was a member of the Industrial Hygiene Foundation in 1946. The transactions of the Eleventh Annual Meeting, Industrial Hygiene Foundation, dated November 7, 1946 contain, beginning at page 71,

an explanation by J. J. Bloomfield of then-existing threshold limit values including the TLV for asbestos. It also appears that an employee of this defendant subscribed to and received the journal, Industrial Hygiene and Occupational Medicine, which contained in 1951, an abstract of an article entitled "A Contribution to the Study of Asbestosis" by P. Cartier, which refers to the TLV for asbestos.

Further, in May, 1979, various papers and reports were produced by an employee of the Trudeau Institute, Mr. Allan Logie, regarding animal experiments conducted at laboratories at Saranac Lake, New York purportedly involving dust collected during the manufacture of Kaylo. These papers and reports may contain information related to the substance of this interrogatory. This defendant has not been able to find those papers and reports in its business records or correspondence although it has searched for and continues to search for them. Among those papers and reports is a paper dated May 29, 1951 which refers to the TLV for asbestos dust.

Additionally, Owens-Corning Fiberglas Corporation produced, in various cases in 1979, papers purporting to relate to this defendant's asbestos-containing product business. One such paper is a copy of a letter to Dr. Miriam Sachs, Chief, Bureau on Adult and Industrial Health, State of New Jersey Department of Health, Trenton, New Jersey regarding State standards. Neither the documents produced by Owens-Corning Fiberglas Corporation nor those produced by Mr. Logie have been located in this defendant's records.

INTERROGATORY NO. 57: State whether you ever knew that any governmental, private agency, and/or other entity issued guidelines suggesting a "threshold limit value" (as defined in Interrogatory No. 56) for exposure to asbestos dust and/or fibers. If so, state:

(a) The identity of the agency or other entity which issued said guidelines;

(b) The verbatim content of said guidelines;

(c) The date said guidelines were issued;

(d) The date you were first aware of the purpose of said guidelines; and

(e) The custodian, location and identity of all documents related thereto.

RESPONSE NO. 57: Refer to response to interrogatory no. 56.

INTERROGATORY NO. 58: State whether you ever possessed knowledge of documents indicating that existing or proposed threshold limit values (as defined in Interrogatory No. 56) were not safe or proper or that lower threshold limit values were necessary in order to prevent diseases caused by exposure to asbestos. If so, identify:

(a) The source of such knowledge;

(b) The persons who obtained such knowledge;

(c) All documents relating thereto; and

(d) The custodian and location of all documents identified in your Answer to Part (c) of this Interrogatory.

RESPONSE NO. 58: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 59: State whether you were ever made aware that the proper method for determining safe levels of asbestos dust was to test concentrations of asbestos fibers in the air rather than the total number of asbestos particles in the air. If so, state:

(a) The source of such knowledge;

(b) The persons who obtained such knowledge;

(c) All documents relating thereto; and

(d) The custodian and location of all documents identified in your Answer to Part (c) of this Interrogatory.

RESPONSE NO. 59: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. The threshold limit value ("TLV") for asbestos during the period in which this defendant manufactured asbestos-containing products, and for some time thereafter, was based upon a time weighted average under a count of asbestos only, including asbestos particles and asbestos fibers. This interpretation is described at various times in the literature. In that regard, see, for example, the Fleischer-Drinker report of 1946, which breaks out the asbestos component of total dust for analysis. Also, see a 1953 article by Isselbacher, Klaus, and Hardy, "Asbestosis and Bronchogenic Carcinoma", American Journal of Medicine, p. 721 (Nov. 1953), in which the authors note that "experience has led to the acceptance of five million particles of asbestos per cubic foot of air, of small enough size to be respirable, to be the safe working concentration for asbestos." Also, please see a report of the committee of the American College of Chest Physicians in 1964, "Asbestosis - Report of the Section on Nature and Prevalence Committee on Occupational Diseases of the Chest", 45 Disease of the Chest, p. 107 (1964), in which it noted that several governmental agencies recommended five million asbestos particles of any length per cubic foot of

air as a safe value for asbestos exposure while other hygienists in 1964 were considering 10 million particles of total dust to be a safe limit. This confirms that the five million standard was then interpreted to be a standard applicable to asbestos dust and not the total dust. Other articles which this defendant would call to your attention are the Fleischer-Drinker article as noted previously, the Dreessen article as noted previously, and the article by J. J. Bloomfield as noted previously. Further, this defendant would call to your attention the annually published threshold limit values of the American Conference of Governmental Industrial Hygienists. Defendant would also call to your attention an article by E. L. Schall, "Present Threshold Limit Value in the U.S.A. for Asbestos Dust: "A Critique", 132 Annals New York Academy of Sciences, p. 316 (1965); and articles by Balzer and Cooper beginning in 1968 entitled, "The Work Environment of Insulating Workers", Vol. 29, American Industrial Hygiene Assoc. Journal, p. 22 (May-June 1958) in which compliance with threshold limit values in shipyards is discussed. There it is indicated that even on a total dust standard, compliance with the TLV was being observed by the authors.

INTERROGATORY NO. 60: State in detail what tests or studies, if any, you ever conducted or directed with regard to the quantity, quality, or threshold limit values as defined in Interrogatory No. 56 of asbestos dust, fibers or particles to which insulators and others who use your asbestos products and/or others working in the same vicinity are exposed.

RESPONSE NO. 60: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in

its records sufficient to enable it to answer this interrogatory. However, information indicating that the level of exposure of insulation workers was below recognized TLV's was readily available in the medical literature after 1946.

INTERROGATORY NO. 61: State in detail what research, tests or studies, if any, you ever conducted or directed to determine whether the exposure of insulation workers or others to asbestos dust exceeded the American Conference of Governmental Industrial Hygienists' (A.C.G.I.H.) recommended threshold limit values.

RESPONSE NO. 61: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 62: State in detail what steps, if any, you ever took to determine whether the American Conference of Governmental Industrial Hygienists' (A.C.G.I.H.) recommended threshold limit values for exposure to asbestos dust were accurate or reliable.

RESPONSE NO. 62: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 63: State your knowledge relating to the meaning of "dose response relationship" as it pertains to exposure to asbestos dusts, fibers and/or products and the contracting of disease, including: asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers.

RESPONSE NO. 63: It is the defendant's understanding of the term "dose response relationship" that the amount of a substance one is exposed to is related to the possibility of development of disease and related to the latency period. Dose is related to intensity and duration of exposure. During the

time this defendant was involved in the asbestos-containing product business, it was this defendant's understanding of the state-of-the-medical art that there was a safe "dose" or level of asbestos to which one could be exposed without risk of disease and that workers such as plaintiff were not exposed to levels above this safe level.

INTERROGATORY NO. 64: State whether you have ever placed any warranties, guarantees or other such representations on any asbestos products identified in your Answer to Interrogatory Nos. 8 and 19 and/or on or in the containers or packages in which said products were sold, distributed or otherwise placed in the stream of commerce.

RESPONSE NO. 64: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 65: If your Answer to Interrogatory No. 64 is in the affirmative, for each such product and/or container or package, identify:

(a) The inclusive dates on which each such warranty, guarantee or other representation appeared on or with the product and/or on or in the container or package;

(b) A verbatim description of each such warranty, guarantee or other representation;

(c) A description of the location on the product and/or container where each such warranty, guarantee or other representation was placed;

(d) Each of your present or former highest supervisory employees with knowledge of the decision to place any such warranties, guarantees or other representations on or with the product and/or on or in the container or package; and

(e) The custodian of all documents in your custody, possession or control which relate to or describe any such warranties, guarantees or other representations or the decision to place any of these on or with the product and/or on or in the container or package.

RESPONSE NO. 65: Refer to response to interrogatory no. 64.

INTERROGATORY NO. 66: State whether the content and/or placement of any warranty, guarantee or other representation described in your Answer to Interrogatory Nos. 64 and 65 was ever changed. If so, for each such change, identify:

(a) The nature of the change, including a verbatim description, if applicable;

(b) The date when the change was made and the inclusive dates during which such change appeared on or with the product and/or on or in the container or package;

(c) The persons with personal knowledge of the reasons for making the change; and

(d) The custodian of documents in your custody, possession or control which relate to the decision and process of making the change.

RESPONSE NO. 66: Refer to response to interrogatory no. 64.

INTERROGATORY NO. 67: State when and by what means you became aware of the alleged hazards of exposure to asbestos dusts, fibers and/or products to the health of persons coming into contact with, handling or using asbestos products.

RESPONSE NO. 67: Insofar as this interrogatory pertains to asbestos-containing products other than Kaylo, this defendant states that it ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and does not have any records from which it can obtain information sufficient to answer this interrogatory, nor can it locate any present employees with knowledge thereof.

Insofar as this interrogatory pertains to its own asbestos-containing product, Kaylo, this defendant states that it ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and does not have any records from

which it can obtain information sufficient to answer this interrogatory. During May, 1979, various papers and reports were produced by an employee of the Trudeau Institute, Mr. Allan Logie, regarding animal experiments conducted at laboratories at Saranac Lake involving dust collected during the Kaylo manufacturing process. These papers and reports may contain information relating to the substance of this interrogatory. The employee, Mr. Logie, had no personal knowledge about the course or conduct of any such experiments, the preparation of papers and reports he produced, or the retention or completeness of those papers and reports. Therefore, he could not authenticate these papers and reports. This defendant has not been able to find these papers and reports in its business records or correspondence although it has searched for and continues to search for them.

This defendant's counsel obtained copies of some of the papers and reports produced by Mr. Logie. However, these copies constitute only a portion of a larger volume of papers and reports which this defendant has not copied. They are available at Milbank, Tweed, Hadley & McCloy, One Chase Manhattan Plaza, New York, New York. This defendant also has reason to believe that plaintiffs' counsel has copies of the documents produced by Mr. Logie. Other documents possibly relating to this interrogatory may have been produced by Owens-Corning Fiberglas Corporation.

Those documents found at Saranac Lake and at Owens-Corning Fiberglas Corporation and elsewhere, which this defendant cannot authenticate, indicate that during the period of time when Owens-Illinois was in the business of manufacturing asbestos-containing products, those products contained a relatively small proportion of asbestos. The inhalation of asbestos dust in excessive amounts over a prolonged period of time (years), under certain conditions, could lead to the potential hazard where exposures were in excess of recognized safe limits, that plant workers were not exposed to levels above the recognized safe limits, that users were not exposed to dust levels above the recognized safe limits, that Kaylo plant employees were x-rayed periodically and displayed no asbestos-related chest disease, and that therefore during the period in which this defendant was in the business of manufacturing Kaylo it had no reason to believe that the foreseeable use of Kaylo would create a hazard to users.

The documents produced by Owens-Corning Fiberglas Corporation indicate that the September, 1955 publication in the A.M.A. Archives of Industrial Health was a publication of inhalation experiments.

To the extent that this interrogatory seeks the production of documents, such documents, as outlined in this response, have not been found as part of this defendant's records and, to the extent that this defendant is in possession of copies of documents, it possesses copies only of documents collected in preparation for litigation. This defendant objects to producing the same. The documents are available from their proper source.

INTERROGATORY NO. 68: State when and by what means you became aware that exposure to asbestos dusts, fibers and/or products was acknowledged to be hazardous to the health of persons coming in contact with, handling or using asbestos products.

RESPONSE NO. 68: Refer to response to interrogatory no. 67.

INTERROGATORY NO. 69: State whether you ever learned that there is a causal connection between exposure to asbestos dust and:

(a) Asbestosis;

(b) Pneumoconiosis;

(c) Lung Cancer;

(d) Mesothelioma; and

(e) Other cancers.

RESPONSE NO. 69: (a-b) During the period of time in which this defendant engaged in the manufacture, sale and distribution of its asbestos-containing products, it was this defendant's understanding that the inhalation of asbestos dust in excessive amounts over a prolonged period of time (years), under certain conditions, could lead to the potential hazard of contracting a disease known as asbestosis. However, in 1958 and before and for some years thereafter, the state of the medical and scientific knowledge was to the effect that there was a safe level of asbestos to which a person could be exposed without risk of injury and to the effect that persons such as plaintiffs were not exposed to excessive amounts of asbestos.

(c-e) This defendant objects to this interrogatory on the basis that the term causal connection is vague, ambiguous and unintelligible. Defendant also objects on the basis that its

present knowledge is irrelevant to this action in that evidence of a causal connection between mesothelioma or any form of cancer and asbestos was first accepted by medical science after the period of time defendant ceased the manufacture of asbestos-containing products. Without waiving its objections, defendant is informed and believes that at no time prior to 1958 was there reason to believe that the medical and scientific community accepted that there was a causal connection established between exposure to asbestos and a risk of contracting mesothelioma or any form of cancer.

INTERROGATORY NO. 70: If your Answer to Interrogatory No. 69 is in the affirmative, identify the following as to each such disease listed therein:

(a) When and by what means you first became aware of such causal connection;

(b) If your awareness of such causal connection was obtained at any conference, lecture, convention, symposium, or other such meeting, identify the event, the person who attended on your behalf and/or any documents obtained from such event; and

(c) If your awareness of such causal connection was obtained from a medical or scientific study, or from any other published works, identify the same.

RESPONSE NO. 70: Refer to response to interrogatory no. 69.

INTERROGATORY NO. 71: State whether you ever specifically informed the purchasers and/or users of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19 that exposure to asbestos dust could cause asbestosis, pneumoconiosis, lung cancer, mesothelioma and/or other cancers. If so, state:

(a) The date(s) of such notice to purchasers or users;

(b) The means used for transmittal of such notice;

(c) The custodian, identity and location of each document which refers to or contains information relevant to such notice; and

(d) The identity of each person who made decisions regarding the furnishing of such notice to purchasers and/or users.

RESPONSE NO. 71: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory. However, it does not appear that any warning concerning asbestos was given in that it does not appear that this defendant had reason to believe that the use of its products would result in a foreseeable risk of harm.

INTERROGATORY NO. 72: State whether you ever specifically informed the distributors identified in your Answer to Interrogatory No. 20 and/or those identified in your Answer to Interrogatory No. 21 who resold or redistributed your asbestos products that exposure to asbestos dust could cause asbestosis, pneumoconiosis, lung cancer, mesothelioma and/or other cancers. If so, state:

(a) The date(s) of such notice;

(b) The means used for transmittal of such notice;

(c) The custodian, identity and location of each document which refers to or contains information relevant to such notice; and

(d) The identity of each person who made decisions regarding the furnishing of such notice to distributors and/or those engaged in the resale or redistribution of your asbestos products.

RESPONSE NO. 72: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

However, it does not appear that any warning concerning asbestos was given in that it does not appear that this defendant had reason to believe that the use of its products would result in a foreseeable risk of harm.

INTERROGATORY NO. 73: State whether you ever provided any caution, notice, warning or other statement or explanation of the potential health hazards of exposure to asbestos on or with the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19.

RESPONSE NO. 73: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory. However, it does not appear that any warning concerning asbestos was given in that it does not appear that this defendant had reason to believe that the use of its products would result in a foreseeable risk of harm.

INTERROGATORY NO. 74: If your Answer to Interrogatory No. 73 is in the affirmative, state as to each product identified in your Answer to Interrogatory Nos. 8 and 19:

(a) The date(s) on which such caution, notice, warning or other statement or explanation first appeared;

(b) The identity of each person with knowledge of decisions made regarding the use of such caution, notice, warning or other statement or explanation;

(c) The verbatim content of each caution, notice, warning or other statement or explanation when it was first used;

(d) Whether the caution, notice, warning or other statement or explanation was ever altered, amended or changed. If so, how, when and why was it altered, amended or changed; and

(e) The location of the caution, notice, warning or other statement or explanation on each such product and/or its container or package.

RESPONSE NO. 74: Refer to response to interrogatory no. 73.

INTERROGATORY NO. 75: State when you first became aware that asbestos products were being labeled with a caution, warning, notice or other statement or explanation concerning the potential health hazards resulting from the use of asbestos products and/or exposure to asbestos dust or fibers and identify the product(s) and manufacturer(s) with which such label was connected.

RESPONSE NO. 75: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory. However, defendant is of the belief that other companies did not issue warnings until after this defendant ceased its operation in 1958.

INTERROGATORY NO. 76: Identify the officer, agent, servant, employee or other representative of yours who first obtained an awareness that asbestos products were being labeled as described in Interrogatory No. 75.

RESPONSE NO. 76: Refer to response to interrogatory no. 75.

INTERROGATORY NO. 77: Identify the custodian, identity and location of all documents related to the knowledge obtained by you regarding the labeling of asbestos products as described in Interrogatory No. 75.

RESPONSE NO. 77: Refer to response to interrogatory no. 75.

INTERROGATORY NO. 78: State when and by what means you first became aware that Johns-Manville Corporation or any of its affiliated companies placed on its asbestos products a caution, warning, notice, other statement or representation concerning the potential health hazards resulting from the use of asbestos products and/or exposure to asbestos dust or fibers.

RESPONSE NO. 78: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 79: Identify the officer, agent, servant, employee or other representative of yours who first became aware that asbestos products of Johns-Manville Corporation or its affiliated companies were being labeled as described in Interrogatory No. 78.

RESPONSE NO. 79: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 80: Identify the custodian, identity and location of all documents related to the knowledge obtained by you regarding the labeling of asbestos products by Johns-Manville Corporation or its affiliated companies as described in Interrogatory No. 78.

RESPONSE NO. 80: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 81: If upon learning that Johns-Manville Corporation or its affiliated companies labeled its asbestos products as described in Interrogatory No. 78 you did not apply such labels to the products identified in your Answer to Interrogatory Nos. 8 and 19, state:

(a) The reason(s) for such a decision;

(b) The identity of any agent, servant, employee, officer or representative of yours involved in discussions and decisions regarding the same; and

(c) The custodian, identity and location of all documents pertaining to such a decision.

RESPONSE NO. 81: Not applicable to this defendant.

INTERROGATORY NO. 82: State whether you specifically informed your employees, agents, servants and/or contract units that use of asbestos products and/or exposure to asbestos dust or fibers was either actually or alleged to be hazardous to their health.

RESPONSE NO. 82: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 83: If your Answer to Interrogatory No. 82 is in the affirmative, state:

(a) When and in what manner you first provided such information to these persons;

(b) The identity of any agent, servant, employee, officer or representative of yours involved in discussions and decisions regarding providing information to these persons;

(c) The verbatim content of any written documents and/or communications containing such information; and

(d) The custodian, identity and location of all documents which relate or pertain to providing such information to these persons.

RESPONSE NO. 83: Refer to response to interrogatory no. 82.

INTERROGATORY NO. 84: Describe in detail any precautionary procedures which you urged or required your employees, agents, servants and/or contract units to follow so as to reduce and/or avoid the potential hazards or dangers associated with use of asbestos products and/or exposure to asbestos dust or fibers and state when and how each such procedure was introduced to these individuals.

RESPONSE NO. 84: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958, and does not have any records from which it can obtain information sufficient to enable it to answer this

interrogatory . Documents which have been located in places other than Owens-Illinois, Inc., indicate that plant workers received periodic chest x-rays pursuant to established company policy, that such x-rays and related health evaluations showed no asbestos-related plant worker lung disease. From the foregoing documents, it further appears that Owens-Illinois, Inc. made efforts to provide ventilation and to control the emissions of dust emitted during the manufacturing process within recognized safe levels of exposure, including the use of respirators in some instances, dust collection equipment and other devices as necessary.

INTERROGATORY NO. 85: State whether you ever required your employees, agents, servants and/or contract units who worked with and around asbestos and/or asbestos products to wear respirators, gas masks, protective clothing and/or other protective devices. If so, state:

(a) Which employees, agents, servants and/or contract units, by type of employment and department, were required to use each such protective device;

(b) The date(s) on which the directive relative to each such protective device was issued for each type of employee and each department;

(c) Which type of protective device was required to be used or worn by each type of employee and each department;

(d) The identity of any agent, servant, employee, officer or representative of yours involved in discussions and decisions regarding the same; and

(e) The custodian, identity and location of all documents pertaining to protective devices.

RESPONSE NO. 85: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and does not have any records from which it can obtain information sufficient to answer this interrogatory.

During May, 1979, various papers and reports were produced by an employee of the Trudeau Institute, Mr. Allan Logie, regarding animal experiments conducted at laboratories at Saranac Lake involving dust collected during the Kaylo manufacturing process. These papers and reports may contain information relating to the substance of this interrogatory. The employee, Mr. Logie, had no personal knowledge about the course or conduct of any such experiments, the preparation of papers and reports he produced or the retention or completeness of those papers and reports. Therefore, he could not authenticate these papers and reports. This defendant has not been able to find these papers and reports in its business records or correspondence although it has searched for and continues to search for them.

This defendant's counsel obtained copies of some of the papers and reports produced by Mr. Logie. However, these copies constitute only a portion of a larger volume of papers and reports which this defendant has not copied. They are available at Milbank, Tweed, Hadley & McCloy, One Chase Manhattan Plaza, New York, New York. This defendant also has reason to believe that plaintiffs' counsel has copies of the documents produced by Mr. Logie. Other documents possibly relating to this interrogatory may have been produced by Owens-Corning Fiberglas Corporation.

INTERROGATORY NO. 86: State whether at the commencement of an individual's employment with you, from 1930 to the present, you inform that person as to possible health ramifications of working with and around asbestos fibers, dust and/or products. If so, set forth:

(a) The nature of the warning;

(b) The manner in which said information is communicated and, if the communication is in writing, attach a copy hereto;

(c) When such practice was initiated; and

(d) By whom such information is communicated.

RESPONSE NO. 86: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory. However, it does not appear that any warning concerning asbestos was given in that it does not appear that this defendant had reason to believe that the use of its products would result in a foreseeable risk of harm.

INTERROGATORY NO. 87: State whether, based upon the material contents, the manufacturing methods and the method of application or installation of your asbestos products, your asbestos products can generally be applied by an insulator or others without liberating asbestos fibers.

RESPONSE NO. 87: This defendant objects to this interrogatory on the basis that the term "liberating" is vague, ambiguous and unintelligible. Without waiving its objection, defendant states that it ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 88: State whether it was foreseeable to you that your asbestos-containing insulation products would have to be removed, stripped or replaced at any time after installation.

RESPONSE NO. 88: This defendant objects to this interrogatory on the basis that it constitutes an improper form of discovery in that plaintiff in effect is submitting a disguised request for admission. This defendant further objects to this interrogatory on the basis that it is vague in that no time period as to when the submitted fact was foreseeable is indicated.

INTERROGATORY NO. 89: State whether you ever provided insulators and others who would be applying or removing your asbestos products instructions concerning safety precautions to use during use of or exposure to such products.

RESPONSE NO. 89: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 90: State when you first received notice that any person was claiming injury as a result of use of and/or exposure to asbestos products identified in your Answer to Interrogatory Nos. 8 and 19.

RESPONSE NO. 90: This defendant received its first lawsuit alleging asbestos-related disease in 1975.

INTERROGATORY NO. 91: With regard to the first notice of claim of injury described in your Answer to Interrogatory No. 90 and regarding all claims filed prior to 1970 for injury resulting from use of and/or exposure to asbestos products, state:

(a) The identity of each claimant;

(b) The date of notice of each claim;

(c) A description of each claim;

(d) The type of injury allegedly sustained by each claimant;

(e) The identity of each attorney representing the individuals making such claims;

(f) The style, case number and court applicable to each claim;

(g) The resolution of each claim; and

(h) The custodian, identity and location of all documents which relate or pertain to each claim.

RESPONSE NO. 91: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence. Without waiving the above objection, refer to answer to Interrogatory No. 90.

INTERROGATORY NO. 92: State whether, prior to 1970, any person filed a claim against any worker's compensation insurance carrier which provided coverage for you alleging that he or she contracted a disease as a result of use of and/or exposure to asbestos products identified in your Answer to Interrogatory No. 90.

RESPONSE NO. 92: During the period in which this defendant engaged in the manufacture of its asbestos-containing products, it received no workers' compensation claims for any asbestos-related disease.

INTERROGATORY NO. 93: If your Answer to Interrogatory No. 92 is in the affirmative, provide the following information:

(a) A list of each such claim by claimant's name, date claim filed and jurisdiction; and

(b) A brief summary of the disposition of each such claim.

RESPONSE NO. 93: Refer to response to interrogatory no. 92.

INTERROGATORY NO. 94: State whether you ever received any reports or communications from your worker's compensation insurance carrier or products liability insurance carrier with regard to potential health hazards incident to use of asbestos products and/or exposure to asbestos fibers or dust.

RESPONSE NO. 94: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958, and does not have any records from which it can obtain information sufficient to enable it to answer this interrogatory.

A document produced at the deposition of E. C. Shuman on June 12, 1979 in a case then pending in the United States District Court for the Eastern District of Virginia, C/P 77-I-N indicates that a "dust survey" was done by the Aetna Casualty and Surety Company, and this defendant believes that it was obtained from Aetna. This document may contain information related to the substance of this interrogatory. This defendant was not a party to that case, the deponent, Mr. Shuman, had no personal knowledge about the contents of the document, its preparation or authenticity. This defendant has not been able to find this document in its business records or correspondence, although it has searched for and continues to search for it, and therefore cannot attest to its authenticity.

To the extent that this interrogatory seeks the production of documents, such documents, as outlined in this response, have not been found as part of this defendant's records and, to the extent that this defendant is in possession of copies of documents, it possesses copies only of documents collected in preparation for litigation. This defendant objects to producing the same. The documents are available from their proper source.

INTERROGATORY NO. 95: If your Answer to Interrogatory No. 94 is in the affirmative, state:

(a) The substance of the contents of such reports or communications;

(b) The identity of the insurance carrier from which you received each report or communication;

(c) The dates of each such report or communication; and

(d) The custodian, identity and location of all documents which relate or pertain to such reports or communications.

RESPONSE NO. 95: Refer to response to interrogatory no. 94.

INTERROGATORY NO. 96: State whether you ever maintained or operated a unit or units of your corporation, including, but not limited to, divisions, subsidiaries or any other entity, which was/were under contract to apply or install the asbestos products described in your Answer to Interrogatory Nos. 8 and 19.

RESPONSE NO. 96: This defendant has never formed nor maintained a group or groups known as "contract units," such "contract units" being a division or group within or maintained by the corporation which, inter alia, engaged in the actual installation of insulation products containing asbestos at job sites.

INTERROGATORY NO. 97: If your Answer to Interrogatory No. 96 is in the affirmative, identify any and all claims filed by workers in such contract units for disease arising out of use of asbestos products and/or exposure to asbestos fibers or dust and, as to each such claim, state:

(a) The date on which you first received notice;

(b) The identity of the claimant;

(c) The nature of the claim;

(d) The style, case number and jurisdiction;

(e) The resolution of the claim; and

(f) The custodian, identity and location of all documents which relate or pertain to each claim.

RESPONSE NO. 97: Not applicable. Refer to response to interrogatory no. 96.

INTERROGATORY NO. 98: Identify any and all insurance agreements entered into by and between any person carrying on an insurance business and you which may be available to satisfy part or all of a judgment that might be entered in this action or to indemnify or reimburse you for payments made to satisfy the judgment. As to each such agreement, identify the insurance carrier, the amount of coverage and the applicable dates of coverage.

RESPONSE NO. 98: This defendant objects to this interrogatory on the grounds that it seeks information which is not relevant to the subject matter of this litigation and is not calculated to lead to the discovery of admissible evidence. Without waiving the above objections, this defendant has liability coverage by its insurer, Aetna, for some of the actions brought against it which allegedly result from the use of asbestos-containing products.

INTERROGATORY NO. 99: Describe the method by which you have maintained records concerning the manufacture, sale, advertising, distribution, delivery and installation of each of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19.

RESPONSE NO. 99: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 pursuant to the sale of its Kaylo division to Owens-Corning Fiberglas Corporation on April 30, 1958. It has not found any information in its records pertinent to a record or document retention policy during the period when it manufactured its asbestos-containing products or for the period of years shortly thereafter. In accordance with the contract for the sale of the Kaylo division, in the ordinary course of business

relating to such sale, and because of the production of certain documents by counsel for Owens-Corning Fiberglas Corporation in several jurisdictions involving asbestos-related litigation in the United States, this defendant believes that most of its records pertinent to the Kaylo division were either transferred or made available to the purchaser of the division in 1958. This defendant states that it has not destroyed any documents or records pertaining to the Kaylo division which have been found in its records in 1975 (the year in which this defendant first became aware of asbestos-related actions against it) and thereafter.

INTERROGATORY NO. 100: With regard to the record-keeping method described in your Answer to Interrogatory No. 99, identify:

(a) Each present and former corporate department, division or subdivision responsible for maintaining the records;

(b) How the records are kept, e.g.,in boxes, files, on microfilm, microfiche or computer tape or disk;

(c) The inclusive dates of manufacture, sale, advertising, distribution, delivery and installation that the record keeping system covers;

(d) The location(s) where such records are maintained; and

(e) The identity of each person employed by you at any time from 1930 to the present, in the highest supervisory capacity, who is or was directly responsible for the collection and maintenance of such records.

RESPONSE NO. 100: Refer to response to interrogatory no. 99.

INTERROGATORY NO. 101: If the record keeping system described in your Answer to Interrogatory No. 99 includes use of microfilm, microfiche, computer tape or disk or any other system in which data is taken from other records, state whether you have

retained the documents or other material from which the information entered into these modes of storage was obtained. If not, indicate:

(a) The date when and location where the original records were destroyed or discarded;

(b) The custodian and location of the records prior to their destruction; and

(c) The identity of each employee, representative, official or agent of yours who ordered, authorized or supervised said destruction.

RESPONSE NO. 101: Refer to response to interrogatory no. 99.

INTERROGATORY NO. 102: State whether, at any time from 1930 to the present you made any representations that the presence of asbestos in the products identified in your Answer to Interrogatory Nos. 8 and 19 made these products superior, in any way, to any asbestos-free product or material intended for the same or similar use.

RESPONSE NO. 102: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 103: If your Answer to Interrogatory No. 102 is in the affirmative, indicate with respect to each such representation:

(a) The date(s) on which the representation was made;

(b) Its exact content; and

(c) The manner in which it was communicated.

RESPONSE NO. 103: Refer to response to interrogatory no. 102.

INTERROGATORY NO. 104: State whether, at any time from 1930 to the present, you made any representations that the use of asbestos or the use of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19 was safe, harmless or not dangerous.

RESPONSE NO. 104: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory. However, it does not appear that any warning concerning asbestos was given in that it does not appear that this defendant had reason to believe that the use of its products would result in a foreseeable risk of harm.

INTERROGATORY NO. 105: If your Answer to Interrogatory No. 104 is in the affirmative, indicate as to each such representation:

(a) The date(s) on which the representation was made;

(b) Its exact content; and

(c) The manner in which it was communicated.

RESPONSE NO. 105: Refer to response to interrogatory no. 104.

INTERROGATORY NO. 106: State whether any of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19 were ever stored or warehoused by you in Maryland at any time from 1930 to the present.

RESPONSE NO. 106: This defendant objects to interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence, except as it relates to the period of time during which this defendant engaged in the manufacture, sale and distribution of its asbestos-containing products. Without waiving its objection, this defendant states that it ceased the manufacture,

sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 107: If your Answer to Interrogatory No. 106 is in the affirmative, identify:

(a) The address of each warehouse or storage facility;

(b) The asbestos products stored or warehoused at each warehouse or storage facility identified in your Answer to part (a) of this Interrogatory;

(c) The year(s) of such storage or warehousing; and

(d) The custodian, identity and location of each document in your custody, possession or control which describes or relates to such storage or warehousing.

RESPONSE NO. 107: Refer to response to interrogatory no. 106.

INTERROGATORY NO. 108: Identify the means by which the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19 were transported to Maryland at any time from 1930 to the present and state:

(a) If the asbestos products were transported by rail, identify the name(s) of the railroad company(ies) providing that service and the year(s) during which such service was used;

(b) If the asbestos products were transported by truck, identify the name(s) of the carrier providing that service and the year(s) during which such service was used;

(c) If the asbestos products were transported by vessel, identify the name(s) of the shipline providing that service and the year(s) during which such service was used;

(d) The identity of each employee of yours responsible for coordinating the transport or delivery of such products to Maryland;

(e) The identity of each employee, officer, agent or representative of yours with personal knowledge of the transport or delivery of such products to Maryland; and

(f) The custodian, identity and location of each document which describes or relates to the transport or delivery of such products to Maryland.

RESPONSE NO. 108: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

INTERROGATORY NO. 109: Identify each person whom you expect to call as an expert witness at trial, state the subject matter on which each expert is expected to testify, state the substance of the findings and opinions to which each expert is expected to testify and a summary of the grounds for each opinion and produce any written report made by each expert concerning those findings and opinions.

RESPONSE NO. 109: The identity of expert witnesses to be called at trial is not known at the present time. This defendant reserves the right to designate at a later date expert witnesses to be used at trial.

INTERROGATORY NO. 110: With regard to expert witnesses identified in your Answer to Interrogatory No. 109, identify by case name, date, court and case number any deposition or testimony given by each such expert and state the custodian and location of transcripts thereof.

RESPONSE NO. 110: Refer to response to interrogatory no. 109.

INTERROGATORY NO. 111: Identify each person who has testified on your behalf at trial or by deposition in a case alleging asbestos-related injury, state the custodian and location of transcripts thereof, and set forth the case name, number, court and date with respect to each proceeding in which the witness testified.

RESPONSE NO. 111: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant is aware that the following present or former employees have testified at trial or by deposition in asbestos-related litigation:

Edward C. Ames	10/8/79, 1/10/80, 2/12/81, 3/26/81 and 10/7/81.
Robert Grim	9/6 & 7/84, 10/11/84
Richard L. Grimmie	7/10/79, 10/24/79 (trial) and 10/29/79 (trial).
David Innis	9/27/83.
William Justice	7/11/79 and 5/3/82.
John Pershing	7/26/79.
John Rhoads	7/11/79.
June Welser	7/11/79.
Everett Shuman	4/26/79, 6/12/79, 7/15/80, 8/19/80, and 3/4/81.
Willis G. Hazard	2/11/80, 2/11/81, 3/27/81, 12/14/81, 1/27/82.
Richard R. Beck	4/1/81 and 8/12/82.
Samuel F. Schillaci	4/7/81, 7/31/81 (trial), 11/9/81 (trial), 11/17/81, 3/10/82, 4/26-27/82, 6/4/84, 8/28/84, 9/6/84, 11/14/84, 2/5/85, 3/4/85 (trial), 4/30/85, 12/19/85 (trial) and 10/8/86.
George N. Bates, M.D.	4/6/81.

Thomas A. Meehan, Esq.	8/3/81 (trial), 11/9/81 (trial), 12/15/83, 1/16/84, 8/28/84, 6/4/84, and 11/13/84.

Effective April 30, 1958, this defendant sold its asbestos-containing product manufacturing division to Owens-Corning Fiberglas Corporation. At that time certain employees who worked in the division, some of whom are mentioned above, transferred to Owens-Corning Fiberglas Corporation. These individuals have been deposed with regard to asbestos-related litigation involving Owens-Corning Fiberglas Corporation.

This defendant objects to the production of copies of the transcripts of these depositions on the basis that said transcripts are filed with various courts around the country, they are therefore matters of public record, and therefore plaintiffs have equal access to such documents. Defendant reserves the right to advance additional arguments against the production of such documents if and when plaintiffs file a request for production.

INTERROGATORY NO. 112: State whether you contend that asbestos products can be manufactured or treated so as to eliminate all potential health hazards to workers who use asbestos products and/or are exposed to asbestos fibers or dust. If so, explain in detail the factual basis for this contention.

RESPONSE NO. 112: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 113: State whether you contend that any person or business entity not presently a party to this action is responsible in whole or in part for any of the plaintiff's(s') damages. If so, identify each such person or business entity and state the facts which form the basis for each such contention.

RESPONSE NO. 113: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 and, to the extent not already pleaded, does not make the contention referred to in this interrogatory at this time. However, its investigation is continuing and defendant hereby reserves the right to make such contention at any time in the future as a result thereof.

INTERROGATORY NO. 114: State whether you contend that asbestos products are not inherently dangerous. If so, state all facts and documents which form the basis for such a contention.

RESPONSE NO. 114: This defendant objects to this interrogatory on the grounds that it is overly broad, vague, not limited to the period of time pertinent to this litigation, burdensome and oppressive, and not reasonably calculated to lead to the discovery of admissible evidence.

INTERROGATORY NO. 115: State whether you contend that you did not have a duty to warn users of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19 of the hazards and risks of use of and exposure thereto. If so, state all facts and identify all documents which form the basis for such a contention

RESPONSE NO. 115: It does not appear that any warning concerning asbestos was given in that it does not appear that this defendant had reason to believe that the use of its products would result in a foreseeable risk of harm.

INTERROGATORY NO. 116: State whether you contend that you performed adequate tests of the safety of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19. If so, state all facts and identify all documents which form the basis for such a contention.

RESPONSE NO. 116: This defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to plaintiffs' counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this interrogatory is continuing.

INTERROGATORY NO. 117: State whether you contend that you did not conspire with others to allow asbestos products to be used without adequate warnings, or without any warnings, regarding the hazards or risks of use of and/or exposure thereto. If so, state all facts and identify all documents which form the basis for such a contention.

RESPONSE NO. 117: Yes. During the time this defendant was involved in the asbestos-containing product business, the state of medical and scientific knowledge was such that defendant had no reason to believe that the use of its product would result in a foreseeable risk of harm. Further, this defendant was not a member of any asbestos-related trade association. This defendant reserves the right to assert any allegations related to the subject matter of this interrogatory at any time in the future.

INTERROGATORY NO. 118: State whether you contend that there are circumstances under which asbestos products can safely be handled and used. If so, state all facts and identify all documents which form the basis for such a contention.

RESPONSE NO. 118: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant is aware of evidence in medical

and scientific literature which would support such a contention. This defendant states that to the extent such literature exists it is public knowledge.

INTERROGATORY NO. 119: State whether you contend that there is now or has ever been a distinction between one or more of the following with respect to use of and exposure to asbestos products and the health hazards or risks relating thereto: miners, millers, textile workers, asbestos plant workers, insulators, shipyard workers, steel plant workers, building tradesmen, industrial workers, and brake lining mechanics. If so, state all facts and identify all documents which form the basis for such a contention.

RESPONSE NO. 119: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant is aware of evidence in medical and scientific literature which would support such a contention. This defendant states that to the extent such literature exists it is public knowledge.

INTERROGATORY NO. 120: State whether you contend that there are differences between asbestos fiber types (chrysotile, amosite, crocidolite, actinolite, anthophyllite or tremolite) with regard to diseases they may be capable of causing. If so, state all facts and identify all documents which form the basis for such a contention.

RESPONSE NO. 120: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant is aware of evidence in medical and scientific literature which would support such a contention. This defendant states that to the extent such literature exists it is public knowledge.

INTERROGATORY NO. 121: Name any person not heretofore mentioned having personal knowledge of the facts material to this case.

RESPONSE NO. 121: This defendant objects to this interrogatory on the basis that it is overly broad and ambiguous, seeks information which is not relevant to the subject matter of this litigation and not reasonably calculated to lead to the discovery of admissible evidence.

PART II - SPECIFIC INTERROGATORIES
TO BE ANSWERED SEPARATELY AS TO EACH PLAINTIFF

For the following Interrogatories, use the following definitions: "Plaintiff's working years" means the years 19__ thru 19__; "plaintiff's employers" mean the companies listed on the attached Rider A, and "plaintiff's employment locations" mean those worksites listed on the attached Rider A.

INTERROGATORY NO. 1: Have you undertaken an investigation of the occurrence(s) alleged in plaintiff's Complaint? If so, state:

a. The identity of the person(s) participating in each such investigation;

b. Whether you have obtained statements from any witness(es) and, if so, identify:

(i) The identity of each such witness; and

(ii) The identity of the person in possession of each such statement.

RESPONSE NO. 1: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence and on the grounds that it may seek to discover work-product material.

INTERROGATORY NO. 2: State whether you contend that you had no reason or duty to warn the plaintiff or the plaintiff's employer of the hazards and risks of use of and exposure to asbestos products. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 2: Yes. It does not appear that any warning concerning asbestos was given in that it does not appear that this defendant had reason to believe that the use of its products would result in a foreseeable risk of harm. Defendant reserves the right to assert any allegations relating to the subject matter of this request at any time in the future.

INTERROGATORY NO. 3: State whether you contend that you gave adequate warnings to users of and to those exposed to your asbestos products, including the plaintiff, of the hazards and risks of use of and exposure thereto. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 3: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory. However, it does not appear that any warning concerning asbestos was given in that it does not appear that this defendant had reason to believe that the use of its products would result in a foreseeable risk of harm.

INTERROGATORY NO. 4: State whether you contend that you recommend safety procedures regarding the use of and exposure to asbestos products to the plaintiff or the plaintiff's employer. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 4: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. This defendant has not found information in its records sufficient to enable it to answer this interrogatory.

INTERROGATORY NO. 5: State whether you contend that the plaintiff was exposed, if at all, to a safe amount of asbestos or to less than the "threshold limit" of exposure to asbestos dust and fibers from the use of and exposure to asbestos products. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 5: To the extent this interrogatory refers to a particular plaintiff, this defendant has not engaged in sufficient discovery to answer this interrogatory. Defendant reserves the right to assert any allegations related to the subject matter of this interrogatory at any time in the future.

INTERROGATORY NO. 6: State whether you contend that the plaintiff's disabilities or injuries are unrelated to the use of and exposure to asbestos products. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 6: To the extent this interrogatory refers to a particular plaintiff, this defendant has not engaged in sufficient discovery to answer this interrogatory. Defendant reserves the right to assert any allegations related to the subject matter of this interrogatory at any time in the future.

INTERROGATORY NO. 7: State whether you contend that the plaintiff's injuries are related in whole or in part to cigarette smoking. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 7: This defendant has not engaged in sufficient discovery to answer this interrogatory. Defendant reserves the right to assert any allegations related to the subject matter of this interrogatory at any time in the future.

INTERROGATORY NO. 8: State whether you contend that the plaintiff's injuries are due to an act of the plaintiff's employer. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 8: This defendant has not engaged in sufficient discovery to answer this interrogatory. Defendant reserves the right to assert any allegations related to the subject matter of this interrogatory at any time in the future.

INTERROGATORY NO. 9: State whether you contend that the plaintiff did not work with and was not exposed to any asbestos products mined, manufactured, sold and/or distributed by you. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 9: This defendant has not engaged in sufficient discovery to answer this interrogatory. Defendant reserves the right to assert any allegations related to the subject matter of this interrogatory at any time in the future.

INTERROGATORY NO. 10: State whether you contend that the asbestos products which the plaintiff used and/or was exposed to were not under your exclusive control. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 10: Yes. Refer to this defendant's pleadings and it's pretrial statement.

INTERROGATORY NO. 11: State whether you contend that there were changes made to your asbestos products after they left your control. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 11: Refer to this defendant's pleadings and it's pretrial statement.

INTERROGATORY NO. 12: State whether you contend that the plaintiff's claim is barred by the applicable statute of limitations. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 12: The affirmative defenses were asserted on advice of counsel to prevent waiver of those defenses. This defendant has not yet engaged in sufficient discovery to answer this interrogatory.

INTERROGATORY NO. 13: State whether you contend that the plaintiff's claim is barred by the doctrine of assumption of the risk. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 13: Yes, this defendant contends that plaintiff assumed the risk to the extent that plaintiff smoked, disregarded warnings, and did not wear a respirator or participate in other safety and health programs provided by his employer. This defendant has not engaged in sufficient discovery to further answer this interrogatory. This defendant reserves the right to supplement its answer to this interrogatory at any time in the future if appropriate under the applicable rules of civil procedure.

INTERROGATORY NO. 14: State whether you contend that the plaintiff's claim is barred by his alleged contributory negligence. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 14: Yes, this defendant contends that plaintiff was contributorily negligent to the extent that plaintiff smoked, disregarded warnings, and did not wear a respirator or participate in other safety and health programs provided by his employer. This defendant has not engaged in sufficient discovery to answer this interrogatory. Defendant reserves the right to supplement its answer to this interrogatory at any time in the future if appropriate under the applicable rules of civil procedure.

INTERROGATORY NO. 15: State whether you contend that the plaintiff's claim is barred by his alleged misuse of the asbestos products with which he worked. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 15: This defendant has not engaged in sufficient discovery to answer this interrogatory. Defendant reserves the right to assert any allegations related to the subject matter of this interrogatory at any time in the future.

INTERROGATORY NO. 16: State whether you contend that the plaintiff's injuries were caused by any intervening acts or superseding negligence. If so, state all facts and identify all documents which form the basis of such a contention.

RESPONSE NO. 16: This defendant objects to this interrogatory on the grounds that the terms "intervening acts" and "superceding negligence" are vague ambiguous and unintelligible.

INTERROGATORY NO. 17: Did this defendant, by itself or through its distributors, engage in the sale of asbestos products to (or application of asbestos products at) any of the plaintiff's employment locations to or any of the plaintiff's employers during the plaintiff's working years? This Interrogatory is not limited to defendant's review of existing sales records; moreover, you are expressly asked to state what steps you took, and persons or documents you consulted, other than reviewing available sales records, in effort to answer this Interrogatory.

RESPONSE NO. 17: This defendant objects to this interrogatory on the grounds that it is overly broad, burdensome and harassing, vague, ambiguous and may seek to discover work-product material and material collected and prepared only in preparation for litigation.

INTERROGATORY NO. 18: If the answer to one or more parts of Interrogatory No. 2 above is affirmative, please state as to each affirmative answer the following:

a. the date on which this defendant began such sales or activity;

b. the date on which this defendant ceased such sales or activity;

c. the type of product, and quantity sold, on each such date.

RESPONSE NO. 18: Refer to objection to Interrogatory No. 17.

INTERROGATORY NO. 19: State the names and addresses of all individuals who have identified this defendant as a source of asbestos products to any of plaintiff's employment locations or employers in any proceeding (whether by way of answers to interrogatories, court appearance or deposition) to which this defendant was a party.

RESPONSE NO. 19: This defendant objects to this interrogatory on the grounds that it is overly broad, burdensome and harassing, vague, ambiguous and may seek to discover work-product material and material collected and prepared only in preparation for litigation.

AFFIDAVIT

STATE OF OHIO)
)SS:
COUNTY OF LUCAS)

M. F. McCARTHY, being duly sworn according to law, deposes and says that he is an Assistant Secretary of Owens-Illinois, Inc., a defendant herein; that as such he is authorized to make an Affidavit on its behalf; and that the facts set forth in the foregoing DEFENDANT, OWENS-ILLINOIS, INC.'S ANSWERS TO INTERROGATORIES, are true and correct to the best of his knowledge, information and belief.

M. F. McCARTHY

SWORN TO and subscribed before me this 27th day of August, 1987.

Notary Public

My Commission Expires:

BEVERLY A. McNEAR
Notary Public — State of Ohio
My Commission Expires Jan. 29, 1990

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Fuels and Combustion, Smith and Stinson, 1952.

Acoustics and Vibrational Physics, Stevens and Bate, 1950;
Acoustical Engineering, Olson, 1957;
Acoustic Measurements, Beranek, 1949;
The Measurement of Hearing, Hirsh, 1952;
Man's World of Sound, Pierce and David, 1958;
Technical Aspects of Sound, edited by Richardson, 1953;
Physiological Acoustics, Weaver and Lawrence, 1954;
Fundamentals of Acoustics, 2nd Edition, Kinsler and Frey, 1950;
Acoustics Noise in Buildings, Parkin and Humphreys, 1958;
Hearing and Deafness, 3rd Edition, edited by Davis and Silverman, 1947;
A Textbook of Sound, Wood, 1949;
Noise Reduction Manual, Geiger, 1953;
Physical Acoustics, Supplement 1, edited by Lukasik and Nolle, 1955;
Foundry Noise Manual, American Foundrymen's Society, 1958 and 1956;
Foundry Ventilation and Dust Control, Harrogate, 1956;
Body Temperature, Its Changes with Environment, Disease and Therapy, Selle, 1952;
Applied Heat Transmission, Stoever, 1941;
Heat and Temperature Measurement, Weber, 1950;
Life Heat and Altitude, Dill, 1938;
Heat Insulation, Wilkes, 1950;
Basic Principles of Ventilation and Heating, Bedford, 1948;
Heat Transmission, McAdams, 1942;
Climate in Everyday Life, Brooks, 1951;

Handbook of Chemistry, Lange, 1956.

Handbook of Emergency Toxicology, Kaye, 1954.

Handbook of Glass Manufacture. By Tooley, 1953.

Handbook of Material Trade Names, Zimmerman and Lavine, 1957.

Handbook of Toxicology, edited by Spector, 1955 and 1957:

History of Factory and Mine Hygiene, Teleky, 1948.

Human Machine, The, Shilling, 1955.

Industrial Environment and Its Control, The, by Dallavalle, 1948.

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Industrial Poisons in the United States, Hamilton, 1929.

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Airborne Contagion and Air Hygiene, An Ecological Study of Traupwood Infections, Wells, 1955.

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The Measurement of Hearing, Hirsh, 1952;
Man's World of Sound, Pierce and David, 1958;
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Physiological Acoustics, Weaver and Lawrence, 1954;
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Acoustics Noise in Buildings, Parkin and Humphreys, 1958;
Hearing and Deafness, 3rd Edition, edited by Davis and Silverman, 1947;
A Textbook of Sound, Wood, 1949;
Noise Reduction Manual, Geiger, 1953;
Physical Acoustics, Supplement 1, edited by Lukasik and Nolle, 1955;
Foundry Noise Manual, American Foundrymen's Society, 1958 and 1956;
Foundry Ventilation and Dust Control, Harrogate, 1956;
Body Temperature, Its Changes with Environment, Disease and Therapy, Selle, 1952;
Applied Heat Transmission, Stoever, 1941;
Heat and Temperature Measurement, Weber, 1950;
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Heat Transmission, McAdams, 1942;
Climate in Everyday Life, Brooks, 1951;

Handbook of Chemistry, Lange, 1956.

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Handbook of Material Trade Names, Zimmerman and Lavine, 1957.

Handbook of Toxicology, edited by Spector, 1955 and 1957:

History of Factory and Mine Hygiene, Teleky, 1948.

Human Machine, The, Shilling, 1955.

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E X H I B I T II

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Industrial Medicine and Hygiene, published by Butterworth and Company, 1954 through 1956.

Industrial Medicine and Surgery, 1949 through 1958.

Journal of Industrial Hygiene and Toxicology, The, published by the Williams and Wilkins Company, 1928 through 1949.

Noise Control, published by the Accoustical Society of America, 1955 through 1958.

Aids to Anatomy, Last, 1951.

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Analytical Chemistry. By Treadwell, Vol. 1, Quantitative Analysis, 1937.

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Technical Aspects of Sound, edited by Richardson, 1953;
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Hearing and Deafness, 3rd Edition, edited by Davis and Silverman, 1947;
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Handbook of Glass Manufacture. By Tooley, 1953.

Handbook of Material Trade Names, Zimmerman and Lavine, 1957.

Handbook of Toxicology, edited by Spector, 1955 and 1957:

History of Factory and Mine Hygiene, Teleky, 1948.

Human Machine, The, Shilling, 1955.

Industrial Environment and Its Control, The, by Dallavalle, 1948.

Industrial Medicine and Hygiene, edited by Merewether, 1954 through 1956.

Industrial Methods of Analysis, Willard, Merritt, and Dean, 1948.

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Industrial Toxicology, Hamilton and Johnstone, 1945.

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Odors Physiology Control, Cord and Witheridge, 1949.

Preventive Medicine and Public Health, Smillie, 1947.

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Women in Industry - Their Health and Efficiency, Baetjer, 1946.

Proceedings of the 9th International Congress on Industrial Medicine, 1949.

The Pneumoconiosis Problem, Thomas, 1958.

Registered June 18, 1946

Trade-Mark 421,786

Republished, under the Act of 1946, Mar. 2, 1949, by Owens-Illinois Glass Company, Toledo, Ohio.

Affidavit under Section 8 accepted.
Affidavit under Section 15 received, Feb. 17, 1954.

UNITED STATES PATENT OFFICE

Owens-Illinois Glass Company, Toledo, Ohio

Act of February 20, 1905

Application September 17, 1945, Serial No. 488,610

KAYLO

STATEMENT

To the Commissioner of Patents:

Owens-Illinois Glass Company, a corporation duly organized under the laws of the State of Ohio and having its principal place of business in the Ohio Building, 405 Madison Avenue, Toledo, Ohio, has adopted and used the trade-mark shown in the accompanying drawing, for THERMAL AND SOUND INSULATING AND BUILDING MATERIALS, USED FOR STRUCTURAL PURPOSES, FIREPROOFING AND FIRE PROTECTION, SUCH MATERIAL CONSISTING OF CALCIUM SILICATE WITH OR WITHOUT REENFORCING MATERIALS, AND COMPRISING INSULATING BOARDS, INSULATING BUILDING BLOCKS, PIPE COVERING, AND ROOFING TILE, in Class 12, Construction materials, and presents herewith five specimens showing the trade-mark as actually used by the applicant upon the goods, and requests that the same be registered in the United States Patent Office in accordance with the act of February 20, 1905.

The trade-mark was used by applicant and applied to the said goods on or about October 12, 1943, and has been continuously used and applied to said goods in applicant's business since that date.

The trade-mark is applied to the containers in which the goods are packed and shipped, by printing or stenciliing the mark thereon.

Said Owens-Illinois Glass Company hereby appoints Rule & Hoge (registry No. 14,124), P. O. Box 1035, Toledo, Ohio, (a firm composed of John F. Rule and J. Ralph Hoge), its attorneys, to prosecute this application for registration, with full power of substitution and revocation, to make alterations and amendments therein, to receive the certificate and to transact all business in the Patent Office connected therewith.

OWENS-ILLINOIS GLASS COMPANY,
By CARL R. MEGOWEN,
Vice-President.

Registered May 11, 1948

Registration No. 500,210

PRINCIPAL REGISTER
Trade-Mark

UNITED STATES PATENT OFFICE

Owens-Illinois Glass Company, Toledo, Ohio

Act of 1946

Application July 5, 1947, Serial No. 527,488

K-LO

(Statement)

Owens-Illinois Glass Company, a corporation duly organized under the laws of the State of Ohio and having its principal place of business in the Ohio Building, Toledo, Ohio, has adopted and used the trade-mark shown in the accompanying drawing, for PIPE COVERING AND HEAT INSULATING BLOCKS CONSISTING OF CALCIUM SILICATE WITH OR WITHOUT REENFORCING MATERIALS, in Class 12, Construction materials, and presents herewith five specimens showing the trade-mark as actually used in connection with such goods, the trade-mark being applied to the goods by printing or stenciling the trade-mark on the containers in which the goods are packed and shipped, and requests that the same be registered in the United States Patent Office on the Principal Register, in accordance with the act of July 5, 1946.

The trade-mark was first used during or about the month of April, 1944, and was first used in commerce in interstate shipments of the goods which may lawfully be regulated by Congress, during or about the month of April, 1944.

The applicant is the owner of the trade-mark "Kaylo," registered June 18, 1946, registration No. 421,786.

(Declaration)

Harold J. Carr, being duly sworn, deposes and says that he is the Vice-President of Owens-Illinois Glass Company, the applicant named in the foregoing Statement, that he believes that said corporation is the owner of the trade-mark, which is in use in commerce in interstate shipments, and that no other person, firm, corporation, or association, to the best of his knowledge and belief, has the right to use such trade-mark in commerce which may lawfully be regulated by Congress, either in the identical form thereof or in such near resemblance thereto as might be calculated to deceive, that the drawing and description truly represent the trade-mark sought to be registered, that the specimens show the trade-mark as actually used in connection with the goods, and that the facts set forth in the Statement are true.

OWENS-ILLINOIS GLASS COMPANY,
By HAROLD J. CARR,
Vice-President.

United States Patent Office

639,220
Registered Jan. 1, 1957

PRINCIPAL REGISTER
Trademark

Ser. No. 4,049, filed Mar. 7, 1956

KAYLO 20

Owens-Illinois Glass Company (Ohio corporation)
405 Madison Ave.
Toledo, Ohio

For: THERMAL AND SOUND INSULATING AND BUILDING MATERIALS, AND COMPRISING INSULATING BOARDS, INSULATING BUILDING BLOCKS, PIPE COVERING, AND ROOFING TILE, in CLASS 12.

First use Dec. 31, 1955; in commerce Dec. 31, 1955.

Owner of Reg. Nos. 421,786, 500,210, and 563,443.

E X H I B I T II

American Medical Association Archives Health, published by the American Medical Association, Vol. 11, 1955, through Vol. 1958.

American Industrial Hygiene Association Quarterly, 1946 through 1958.

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Women in Industry - Their Health and Efficiency, Baetjer, 1946.

Proceedings of the 9th International Congress on Industrial Medicine, 1949.

The Pneumoconiosis Problem, Thomas, 1958.

RESPONSE NO. 2: This Defendant objects to this Interrogatory on the basis that it is overly broad and unduly burdensome, and calls for information which is immune from discovery under the attorney work product doctrine.

Without waiving above objections this Defendant states that it has referred to the relevant business records of the Owens-Illinois Glass Company, which are still in the possession of Owens-Illinois, Inc., in connection with the preparation of answers to these Interrogatories unless otherwise indicated.

INTERROGATORY NO. 3: State whether you are a corporation. If so, state: your corporate name; state of incorporation; date of incorporation; address of principal place of business; address(es) of any other place of business; whether, if you are a "foreign corporation" as defined in Maryland General Corporation Law Sec. 1-101(1), you are now or have ever been registered or qualified to do business in the State of Maryland; and the corporate name, state of incorporation and date of incorporation of any subsidiary, predecessor or affiliate corporation.

RESPONSE NO. 3: Owens-Illinois Glass Company was incorporated in the State of Ohio in 1929. Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965. The address of the principal place of business is One SeaGate, Toledo, Ohio 43666.

INTERROGATORY NO. 4: Identify all prior names by which you have existed.

RESPONSE NO. 4: Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965.

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(g) The terms and conditions of any contracts or agreements by and between you and such corporation(s) or business entity(ies), including, but not limited to, the terms and conditions relating to the transfer of liabilities for obligations of such corporation(s) or business entity(ies);

(h) Whether you continued the manufacture, sale and/or distribution of such corporation's or business entity's asbestos products and, if so, whether you used the same product name(s) in so doing; and

(i) Whether there was an identity of name, officers, directors, personnel, property, suppliers, distribution outlets and/or clients between you and such corporation(s) or business entity(ies);

RESPONSE NO. 7: Refer to Response No. 6.

INTERROGATORY NO. 8: If you have directly or indirectly mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce asbestos or asbestos-containing products, state as to each such product, indicating separately those products dealt with by you, your predecessor(s) in interest, your subsidiary(ies), and your affiliate(s), if any, the following:

(a) Brand name, trade-name, and/or trade-mark;

(b) The generic name or identity;

(c) Description, including size, shape, color and composition, i.e. solid, powder or other form;

(d) Chemical and physical composition, including, but not limited to, the percentage of asbestos by weight and volume;

(e) Type of asbestos, i.e. chrysotile, amosite, crocidolite, actinolite, anthophyllite, or tremolite, indicating the percentage of each such asbestos fiber by weight and volume;

(f) Intended marketable use; and

(g) Dates during which each asbestos product was mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce.

RESPONSE NO. 8: (a) Kaylo and Kaylo-20;

(b) This Defendant's asbestos-containing products were hydrous calcium silicate materials;

(c) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

(d) This Defendant ceased the manufacture, sale and distribution of its asbestos-containing products in 1958. Its investigation as to the composition of each such product, including the type of asbestos-contained therein (i.e., amosite or chrysotile) and the quantitative percentage of asbestos, is continuing, although this Defendant now believes that this Defendant's commercially produced asbestos-containing products were hydrous calcium silicates containing between 13% and approximately 20% asbestos. Chrysotile asbestos was the primary type apparently used. Amosite was used to a lesser extent.

(f) The asbestos-containing products manufactured by this Defendant were intended to be used for industrial high temperature thermal insulation such as pipe covering and block insulation, and to increase fireproofing and fire protection and for insulation through use as a roof deck or fireproof material or door core material.

O-1 ROG

(g) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

INTERROGATORY NO. 9: State whether you presently mine, manufacture, produce, fabricate, import, convert, compound, process, sell, merchandise, supply, distribute and/or otherwise place in the stream of commerce any asbestos product(s) listed in your Answer to the preceding interrogatory.

RESPONSE NO. 9: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. It does not now, and it has not since that time, manufactured, sold or distributed any asbestos-containing products.

INTERROGATORY NO. 10: Identify each individual who participated in the design and preparation of manufacturing specifications for each asbestos product identified in your Answer to Interrogatory No. 8.

RESPONSE NO. 10: This Defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 11: State whether any written memoranda, specifications, blueprints or other written materials of any kind or character now exist relating to the design and preparation of the asbestos products identified in your Answer to Interrogatory No. 8. If so, identify:

(a) Each such written material or document; and

(b) The custodian, identity and location of each written material or document.

RESPONSE NO. 11: This defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to Plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 12: Identify, by location and product, each plant of your in which the asbestos products identified in your Answer to Interrogatory No. 8 have been manufactured and/or assembled and the dates said plants have been in operation.

RESPONSE NO. 12: This defendant's manufacturing plants were located in Berlin, New Jersey and Sayreville, New Jersey. The Berlin plant was in operation from approximately 1943 until on or about April 30, 1958. The Sayreville plant was in operation from February, 1948 until about April 30, 1953.

INTERROGATORY NO. 13: If you have discontinued mining, manufacturing, producing, fabricating, importing, converting, compounding, processing, selling, merchandising, supplying, distributing and/or otherwise placing in the stream of commerce any asbestos products listed in your Answer to Interrogatory No. 8, identify the products discontinued, give the date of discontinuance and specify the reason(s) for such discontinuance.

0-1 ROG

RESPONSE NO. 13: In 1953, this Defendant entered into a sales agreement with Owens-Corning Fiberglas Corporation under which it agreed to the sale of asbestos-containing products to that corporation. This Defendant believes that it ceased the general marketing and sales of its asbestos-containing thermal insulation products at that time, disbanded its sales force, and that thereafter, Owens-Corning Fiberglas Corporation was the primary marketer of its product until the sale of the division to Owens-Corning Fiberglas Corporation in 1958.

INTERROGATORY NO. 14: If you have done so, when did you first determine that any other material could be used in place of asbestos for high-temperature insulation or any other use to or for which asbestos has been applied. If you have, in fact, substituted other material(s) for asbestos in your product(s), then state:

(a) The identity of such substituted material(s);

(b) When the product(s) with such substituted material(s) was first marketed; and

(c) The tradename(s) and brand name(s) of the product(s) marketed with such substituted material(s).

RESPONSE NO. 14: This defendant has located information in its records indicating that several efforts were made to substitute other materials for the asbestos in its Kaylo products; however, such efforts were unsuccessful. Defendant will make available to plaintiffs' counsel through its local counsel reports on such experiments. Some of the reports are contained on microfilm which is old and of poor quality.

RESPONSE NO. 21: This Defendant ceased the manufacture, sale and distribution of asbestos-containing thermal insulation products in 1958. This Defendant states that in 1953 it entered into a "Sales Agreement" under which it agreed to sell certain amounts of its asbestos-containing thermal insulation products to Owens-Corning Fiberglas Corporation. Furthermore, this Defendant has found information in its records which indicate that in at least 1956, it placed Owens-Corning Fiberglas Corporation's logo on some of its boxes. This Defendant does not have information sufficient to further respond to this Interrogatory.

INTERROGATORY NO. 22: State the following with respect to the packages and containers in which you sold, distributed or otherwise furnished each of the asbestos products described in your Answer to Interrogatory Nos. 8 and 19 on a year-by-year and product-by-product basis;

(a) A description of the package or container in which each product was sold, distributed or otherwise furnished, including composition, size, shape and color;

(b) A description of the markings or printed material that appeared on each package or container, indicating the size and color of the same;

(c) A description of any logo or other design appearing on the package or container;

(d) A verbatim description of any caution or warning notice appearing on the package or container, setting forth the year(s) in which each such notice appeared on each such product; and

(e) A verbatim description of any instructions appearing on the package or container.

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IN THE CIRCUIT COURT FOR BALTIMORE CITY

*
* ALL CT-1 CASES
* ALL CT-2 CASES
* ALL CT-4 CASES
* ALL CT-5 CASES
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DEFENDANT OWENS-ILLINOIS, INC.'S ANSWERS TO PLAINTIFFS' MASTER INTERROGATORIES TO ALL DEFENDANTS

To: All Defendants, to be answered individually and separately by each Defendant.

Plaintiffs, by their attorneys, John T. Enoch, John Amato, IV, and Goodman, Meagher & Enoch, request Defendants to answer the following Interrogatories. The Interrogatories are to be read and answered in accordance with the following instructions and definitions.

a. These Interrogatories are continuing in character and, in accordance with the Maryland Rules, you are required to supplement your answers promptly after you obtain further material information.

defendant made appropriate efforts to provide ventilation and to control the emissions of all dust emitted during the manufacturing process within recognized save levels of exposure, including the use of respirators in some instances, dust collection equipment and other devices as necessary. Therefore, during the period in which this defendant was in the business of manufacturing Kaylo it had no reason to believe that the foreseeable use of Kaylo would create a hazard to users.

The documents produced by Owens-Corning Fiberglas Corporation indicate that the September, 1955 publication in the A.M.A. Archives of Industrial Health was a publication of inhalation experiments.

To the extent that this interrogatory seeks the production of documents, such documents, as outlined in this response, have not been found as part of this defendant's records and, to the extent that this defendant is in possession of copies of documents, it possesses copies only of documents collected in preparation for litigation. This defendant objects to producing the same. The documents are available from their proper source.

INTERROGATORY NO. 39: Identify all trade organizations, associations or other entities to which you belong or belonged. Said organizations, etc., include, at a minimum, the following:

Asbestos Textile Institute (ATI);

Industrial Hygiene Foundation and/or Industrial Health Foundation (IHF);

Mineral Wool Institute;

Industrial Mineral Insulation Manufacturers Institute;

Magnesia Silica Insulation Manufacturers Association;

National Insulation Manufacturers Association (NIMA);

Thermal Insulation Manufacturers Association (TIMA);

Asbestos Information Association (AIA);

Quebec Asbestos Mining Association (QAMA);

National Safety Council;

Asbestos Cement Producers Association;

Refractories Institute.

RESPONSE NO. 39: This defendant objects to this interrogatory on the grounds that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence except as it relates to the period of time within which this defendant manufactured its asbestos-containing products.

Without waiving the above objection, this defendant states that insofar as this interrogatory refers to associations or organizations of which this defendant was a member during the time when it manufactured asbestos-containing products, it was a member of the Industrial Hygiene Foundation (which changed its name to the Industrial Health Foundation in 1970) for the years 1936 through 1975. This defendant was not a member of any of the other organizations about which this interrogatory inquires.

INTERROGATORY NO. 40: For each trade organization, association or other entity identified in your Answer to Interrogatory No. 39, state:

(c) All documents relating to Saranac Laboratory studies or tests which were received or submitted by you, either directly or indirectly through predecessor(s) in interest, subsidiary(ies) or affiliate(s), if any, through other companies, or through any trade associations, organizations or entities;

(d) All recommendations or findings of such studies in relation to:

(i) adequacy or inadequacy of the threshold limit values;

(ii) the substitution of materials for asbestos; and

(e) The custodian and location of all documents and/or communications identified in your Answer to this Interrogatory.

RESPONSE NO. 45: Refer to response to interrogatory no. 44.

INTERROGATORY NO. 46: State the amount of money spent or contributed by you annually from 1930 to the present for research of the relationship between exposure to asbestos dusts, fibers and/or products and any pulmonary pathology and identify each person or organization to whom the expenditure or contribution was made.

RESPONSE NO. 46: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

INTERROGATORY NO. 47: State whether you have ever maintained a library (or libraries) which contains books, articles, periodicals, journals and/or reference materials that relate to the subjects of asbestos, industrial hygiene, medicine, safety, occupational disease and/or engineering. If so, state:

(a) The date each such library was established;

(b) The location of each such library;

(c) The identity of each librarian or other person in charge of the operation and materials of each such library;

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(d) For whose use each such library was established;

(e) The title, publisher and dates of subscription to or acquisition of each such periodical or journal for each such library; and

(f) The title, author, publisher, date and dates of acquisition of each such article and book for each such library.

RESPONSE NO. 47: During the period of time pertinent to these actions, this defendant did not maintain an entity which would be characterized as an industrial hygiene, medicine, safety and/or engineering library. However, this defendant believes that a separate engineering library may have been maintained by its technical facility. This defendant also states that although it has no records indicating the existence of such a library, upon becoming involved in asbestos-related litigation this defendant listed all the publications which were in its then-existing industrial hygiene library. These publications are listed on Exhibit II. This defendant has not yet determined which, if any, of these publications were in this defendant's possession during the time it manufactured, sold and distributed asbestos-containing products.

INTERROGATORY NO. 48: State whether any of the co-defendants in asbestos litigation have ever furnished you with any information as to the state of the medical knowledge at any time regarding the relationship between exposure to asbestos dusts, fibers and/or products and the contracting of diseases, including asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers.

RESPONSE NO. 48: This defendant objects to this interrogatory as being irrelevant and not reasonably calculated to lead to the discovery of admissible evidence and not limited

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EXHIBIT II

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American Medical Association Archives Health, published by the American Medical Association, Vol. 11, 1955, through Vol. 1958.

American Industrial Hygiene Association Quarterly, 1946 through 1958.

Annual Review of Nuclear Science, published by Annual Reviews, Inc., 1952 through 1953; 1955 through 1957.

Archives of Industrial Hygiene and Occupational Medicine, published by the American Medical Association; 1950 to 1954.

British Journal of Industrial Medicine, published by British Medical Association, 1949 through 1958.

Industrial Medicine and Hygiene, published by Butterworth and Company, 1954 through 1956.

Industrial Medicine and Surgery, 1949 through 1958.

Journal of Industrial Hygiene and Toxicology, The, published by the Williams and Wilkins Company, 1928 through 1949.

Noise Control, published by the Accoustical Society of America, 1955 through 1958.

Aids to Anatomy, Last, 1951.

Airborne Contagion and Air Hygiene, An Ecological Study of Traupwood Infections, Wells, 1955.

Analytical Chemistry. By Treadwell, Vol. 1, Quantitative Analysis, 1937.

Chemical Analysis of Industrial Solvents, Jacobs and Scheslan, 1953.

Chemical Engineers' Handbook, edited by Perry, 1941.

Design of Industrial Exhaust Systems, Alden, 1939.

Dictionary of Modern English Usage, A, by Fowler, 1926.

Electromagnetically Enriched Isotopes and Mass Spectrometry, Proceedings of the Conference Held in Cockcroft Hall, Harwell, Sept., 1955;

Encyclopedia of Instrumentation for Industrial Hygiene, edited by Yasse, Byers and Hosey, 1956.

Fatigue, edited by Floyd and Welford, 1953.

Fatigue of Workers - Its Relation to Industrial Production, Committee on Work Industry of the National Research Council, 1941.

Fuels and Combustion, Smith and Stinson, 1952.

Acoustics and Vibrational Physics, Stevens and Bate, 1950;
Acoustical Engineering, Olson, 1957;
Acoustic Measurements, Beranek, 1949;
The Measurement of Hearing, Hirsh, 1952;
Man's World of Sound, Pierce and David, 1958;
Technical Aspects of Sound, edited by Richardson, 1953;
Physiological Acoustics, Weaver and Lawrence, 1954;
Fundamentals of Acoustics, 2nd Edition, Kinsler and Frey, 1950;
Acoustics Noise in Buildings, Parkin and Humphreys, 1958;
Hearing and Deafness, 3rd Edition, edited by Davis and Silverman, 1947;
A Textbook of Sound, Wood, 1949;
Noise Reduction Manual, Geiger, 1953;
Physical Acoustics, Supplement 1, edited by Lukasik and Nolle, 1955;
Foundry Noise Manual, American Foundrymen's Society, 1958 and 1956;
Foundry Ventilation and Dust Control, Harrogate, 1956;
Body Temperature, Its Changes with Environment, Disease and Therapy, Selle, 1952;
Applied Heat Transmission, Stoever, 1941;
Heat and Temperature Measurement, Weber, 1950;
Life Heat and Altitude, Dill, 1938;
Heat Insulation, Wilkes, 1950;
Basic Principles of Ventilation and Heating, Bedford, 1948;
Heat Transmission, McAdams, 1942;
Climate in Everyday Life, Brooks, 1951;

Handbook of Chemistry, Lange, 1956.

Handbook of Emergency Toxicology, Kaye, 1954.

Handbook of Glass Manufacture. By Tooley, 1953.

Handbook of Material Trade Names, Zimmerman and Lavine, 1957.

Handbook of Toxicology, edited by Spector, 1955 and 1957:

History of Factory and Mine Hygiene, Teleky, 1948.

Human Machine, The, Shilling, 1955.

Industrial Environment and Its Control, The, by Dallavalle, 1948.

Industrial Medicine and Hygiene, edited by Merewether, 1954 through 1956.

Industrial Methods of Analysis, Willard, Merritt, and Dean, 1948.

Industrial Poisons in the United States, Hamilton, 1929.

Industrial Toxicology, Hamilton and Johnstone, 1945.

Introduction to Medical Biometry and Statistics, Pearl, 1923.

Introductory Quantitative Chemistry, Olson, Koch and Pimentel, 1955.

Language Habits in Human Affairs, Lee, 1941.

Manual of Industrial Health Hazards, Ficklen, 1940.

Manual of the International List of Causes of Death, U.S. Government Printing Office, 1929.

Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, Vol. 2, Alphabetical Index, 1950.

Mechanical Engineer's Handbook, edited by Marks, 1951.

Methods of Air Analysis. By Haldane, 1935.

Noxious Gas and the Principles of Respiration Influencing their Action, Henderson and Haggard, 1927.

Odors Physiology Control, Cord and Witheridge, 1949.

Preventive Medicine and Public Health, Smillie, 1947.

Professional Engineer's Examination Questions and Answers, Londe, 1956.

Radioisotopes in Scientific Research, edited by Extermann, 1958.

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Roget's College Thesaures, The New American Library, 1958.

Standard Methods of Chemical Analysis, Scott, 5th Edition, 1925.

Symposium on Instrumentation in Atmospheric Analysis, published by The American Society for Testing and Materials, 1958.

Toxicology and Hygiene of Industrial Solvents, edited by Lehmann and Flury, 1943.

Women in Industry - Their Health and Efficiency, Baetjer, 1946.

Proceedings of the 9th International Congress on Industrial Medicine, 1949.

The Pneumoconiosis Problem, Thomas, 1958.

AFFIDAVIT

STATE OF OHIO)

)SS:

COUNTY OF LUCAS)

M. F. McCARTHY, being duly sworn according to law, deposes and says that he is an Assistant Secretary of Owens-Illinois, Inc., a defendant herein; that as such he is authorized to make an Affidavit on its behalf; and that the facts set forth in the foregoing DEFENDANT, OWENS-ILLINOIS, INC.'S ANSWERS TO INTERROGATORIES, are true and correct to the best of his knowledge, information and belief.

M. F. McCARTHY

SWORN TO and subscribed before me this 27th day of August, 1987.

Notary Public

My Commission Expires:

BEVERLY A. McNEAR
Notary Public — State of Ohio
My Commission Expires Jan. 29, 1990

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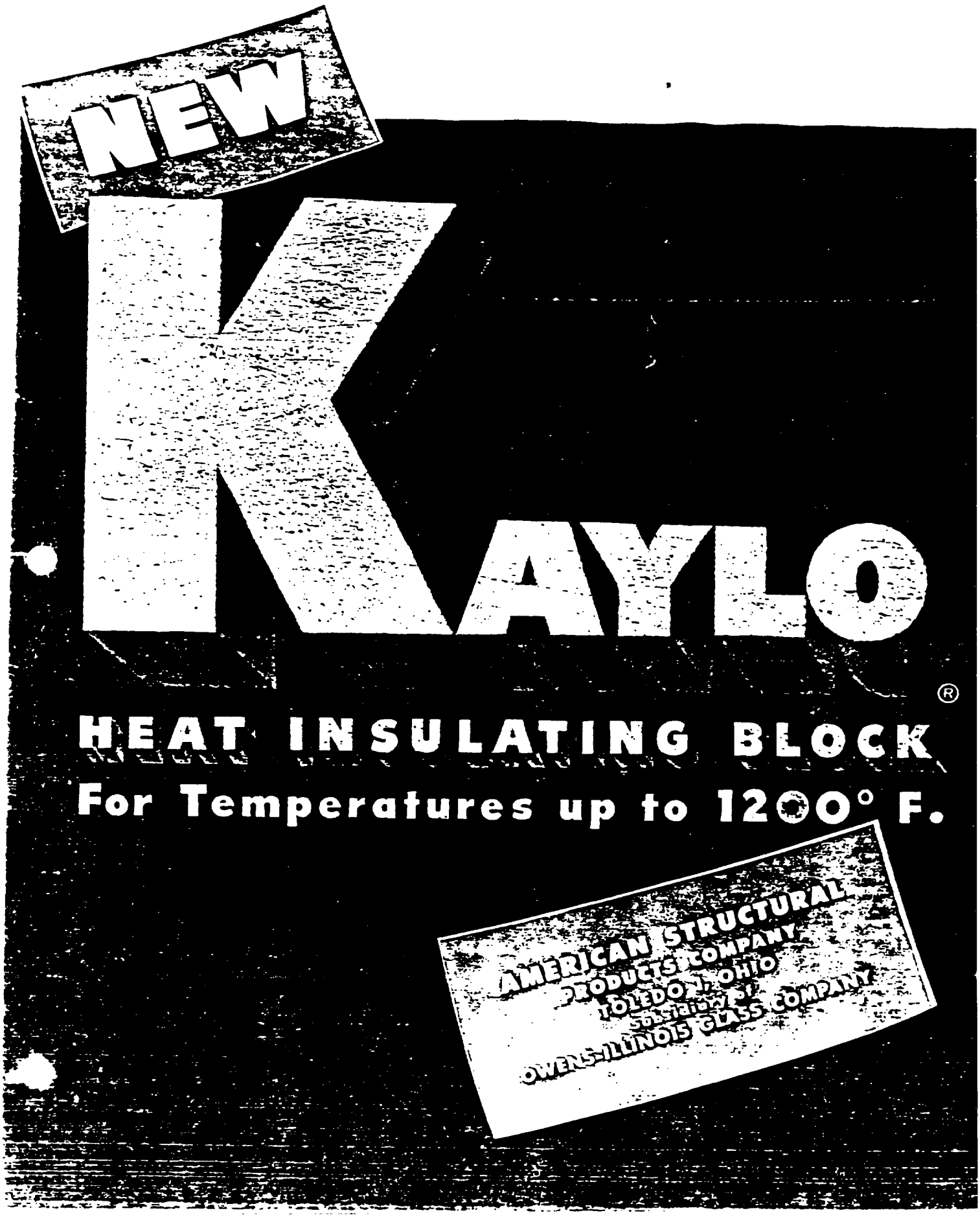
EXHIBIT III


NEW
KAYLO
®
HEAT INSULATING BLOCK
For Temperatures up to 1200° F.
AMERICAN STRUCTURAL PRODUCTS COMPANY
TOLEDO 1, OHIO
OWENS-ILLINOIS GLASS COMPANY

A NEW HEAT INSULATION WITH A REMARKABLE COMBINATION OF ADVANTAGES....

Kaylo Heat Insulating Block a new type of lightweight mineral sulation that is *efficient* enough to used at ordinary room temperatu and *resistant* enough to perform ef tively up to 1200° F.

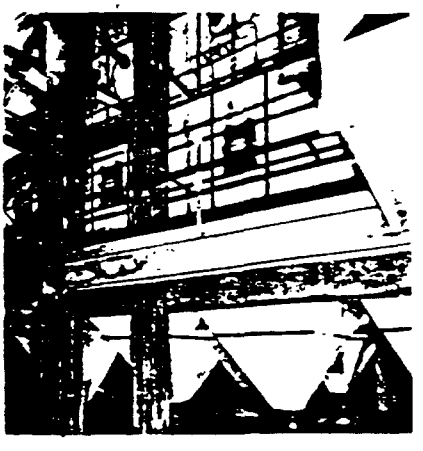
Few new products of any kind h been so thoroughly researched bef being placed on the market. Ka Heat Insulating Block is the achie ment of many years' work by Owe Illinois Glass Company enginee physicists and chemists.

No other material, new or old, effectively combines the most des able characteristics of the ideal h insulation.

For instance . . .

LOW DENSITY

Kaylo Heat Insulating Blo weighs only 11 pounds per cubic fo This light weight (less than one pou to the board foot) simplifies handli shipping and application. It grea reduces weight—an important adv tage on ships, for an example.



Notice the clean, straight edg on these insulated precipitator ho pers. Applicators find it easy to do t kind of work with Kaylo Heat Insu ing Block because they are so easy cut and yet they have a tively hi flexural strength. The w s above hoppers are also insulated with Ka Heat Insulating Block.

OW THERMAL CONDUCTIVITY

The coefficient of conductivity, or K", of Kaylo Heat Insulating Block, s shown on the chart on page four, ... it among the most efficient in-ulations for medium high tempera-ures. Its insulation value comes prin-ipally from its fine, interlaced cellular tructure. These cells are so tiny and o numerous that they present a ma-erial surface of approximately 140 cres per cubic foot of insulation.

Experience shows that the insula-ion value of Kaylo insulation im-roves when the material is put into ervice.

EFFECTIVE OVER WIDE TEMPERATURE RANGE

Kaylo Heat Insulating Block per-orms efficiently not only on tempera-ures in the low pressure steam and hot water range but on temperatures in he superheated steam range as well. This is shown by the flatness of the conductivity curve. One-material cov-erage with Kaylo insulation handles applications which often require two thicknesses of different materials.

HIGH COMPRESSIVE STRENGTH

...s compressive strength is un-usu...y high for a mineral product of such light weight. Kaylo Heat Insu-lating Block withstands compression values equivalent to those of a man's walking on it or even to those of a heel's being ground into it.

HIGH FLEXURAL STRENGTH

Its flexural strength is higher than the normal requirement for heat insu-lation of this type. This strength makes for easy handling and applica-tion, and contributes to long service with low maintenance.

NO ADDED BINDER

Kaylo insulation is an inorganic compound, containing no added binder. Its performance characteris-tics, therefore, are not affected by additives, which often reduce insulat-ing value, modify effective tempera-ture range or otherwise limit per-formance.

EASY TO APPLY WELL

Kaylo Heat Insulating Blocks are clean-cut and trim. They are easy to fit into place to make a good-looking installation. **Their "feel" is pleasant and non-irritating.** They can be cut, scored and sawed with ordinary wood-working tools. Finishes that go over the block, whether cement, cloth or other types, can be applied smoothly and with a minimum of effort. No special tools are needed.

LOW MOISTURE ABSORPTION

Moisture absorption is no prob-lem with Kaylo insulation. Even when subjected to an atmosphere of 90% relative humidity and a temperature of 120° F., in standard tests, speci-mens absorb less than 1% moisture by volume.

RETAINS EFFECTIVENESS AFTER LONG SERVICE

Kaylo Heat Insulating Block re-mains strong, free from excessive powdering, and shows little loss in weight or shrinkage after long appli-cation to temperatures up to 1200° F. Even conventional tumbling tests, run after prolonged heating, produce relatively little crumbling or break-down of the material.

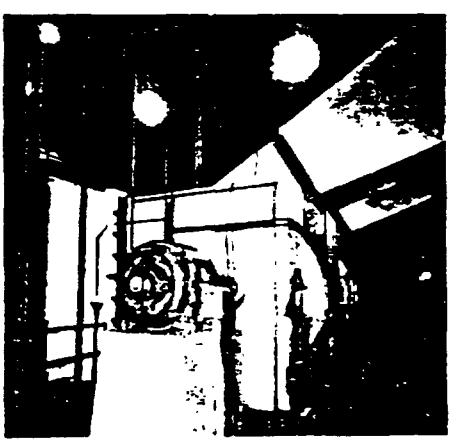
STANDARD SIZES

Lengths (inches)	Widths (inches)	Thicknesses (inches)
36	6	1
36	6	1½
36	6	2
36	6	2½
36	6	3
36	12	1
36	12	1½
36	12	2
36	12	2½
36	12	3

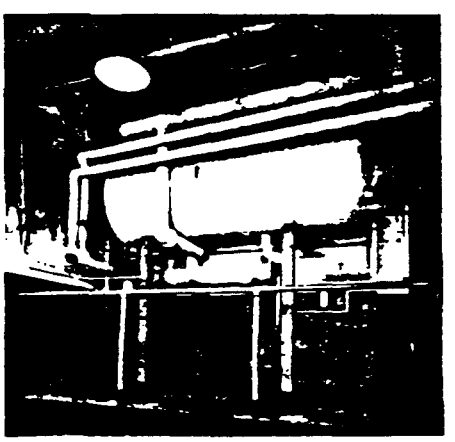
Other sizes are available on special order.

ND A REMARKABLE VERSATILITY

On large or small equipment, in-side or out, Kaylo Heat Insulating Block performs efficiently and with a minimum of maintenance. Here it is bei-g applied to the walls of a large p... ...itator. Workmen are laying block over 6" x 6" wire mesh welded to the stiffeners. The block are then covered with finishing cement and asphalt mastic weatherproofing.



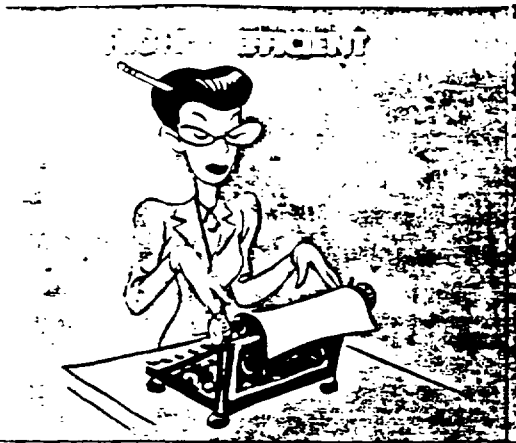
Kaylo Heat Insulating Block cov-ers both flat and curved surfaces on the power house equipment pictured here. At the right are fresh air intakes; the center compartments house in-duced draft fans; and at the left are conduits leading to a precipitator. Kaylo insulation means continuous fuel savings to this power plant.



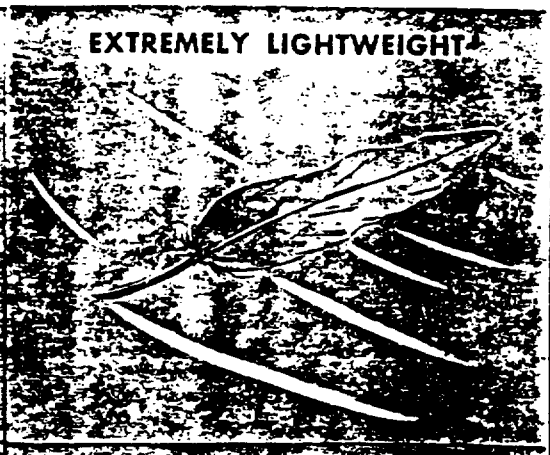
Hot water is always ready when needed in the office building where this hot water storage tank is installed, thanks to Kaylo Heat Insulating Block. This permanent insulation holds water temperature constant with a minimum of power consumption.

Other applications for Kaylo Heat Insulat-ing block are listed on the back page.

PRINCIPAL FEATURES OF KAYLO HEAT INSULATING BLOCK

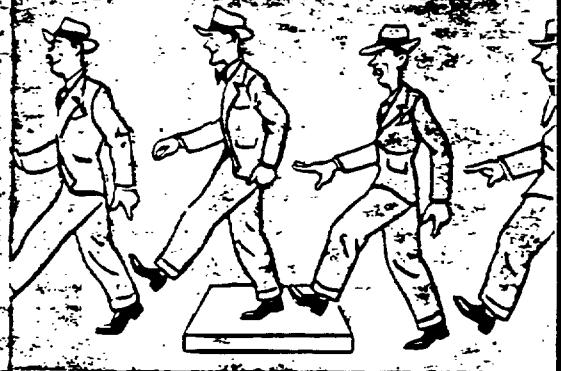


HIGH EFFICIENCY

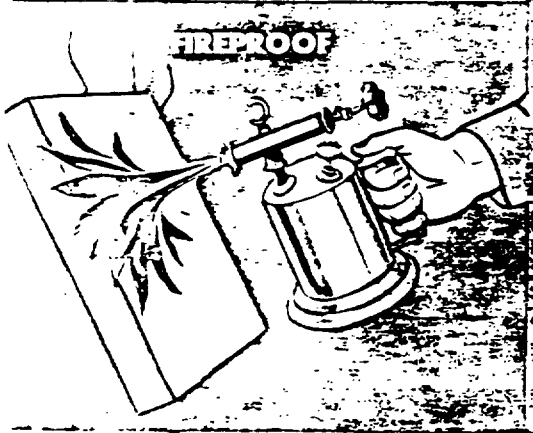


EXTREMELY LIGHTWEIGHT

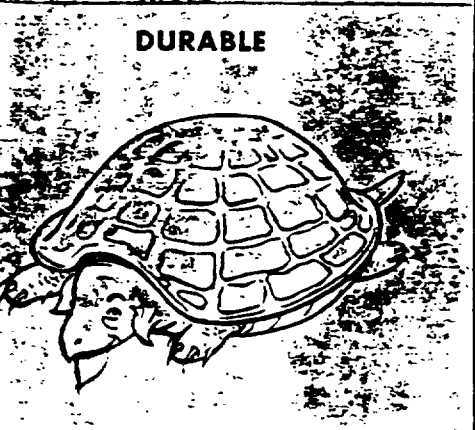
EASY TO APPLY



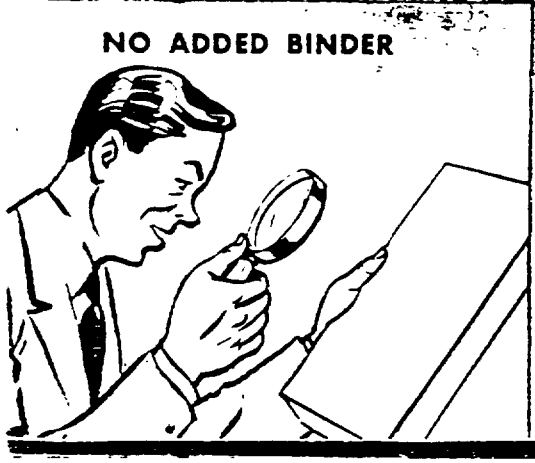
HIGH COMPRESSIVE STRENGTH



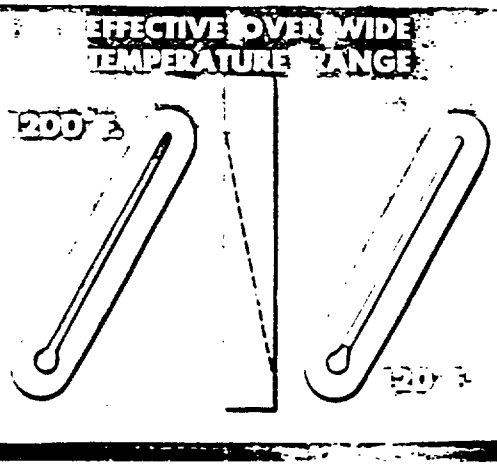
FIREPROOF



DURABLE



NO ADDED BINDER

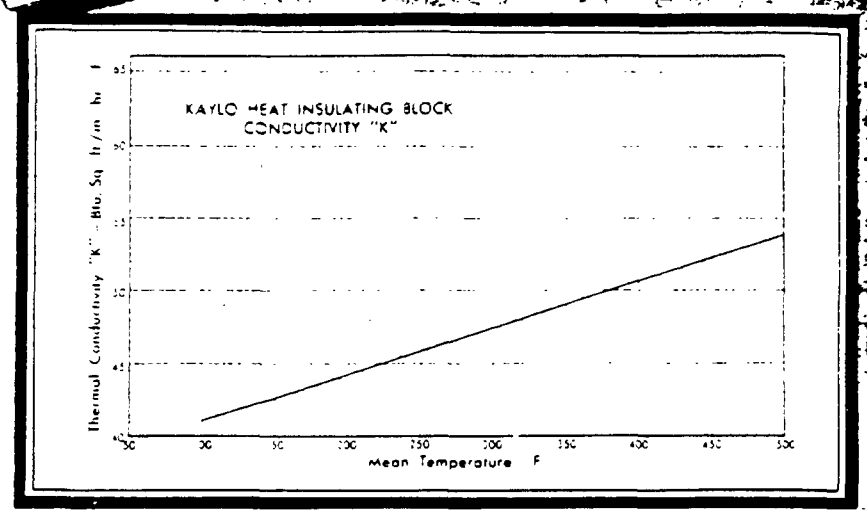


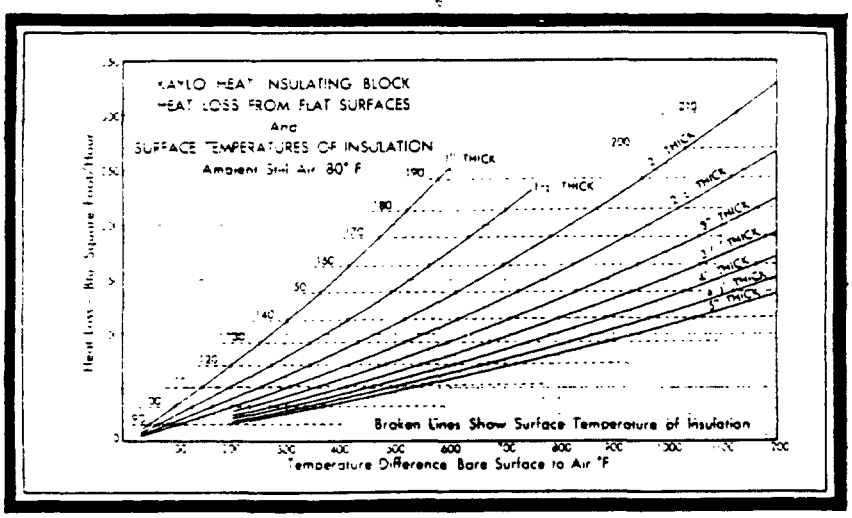
EFFECTIVE OVER WIDE TEMPERATURE RANGE

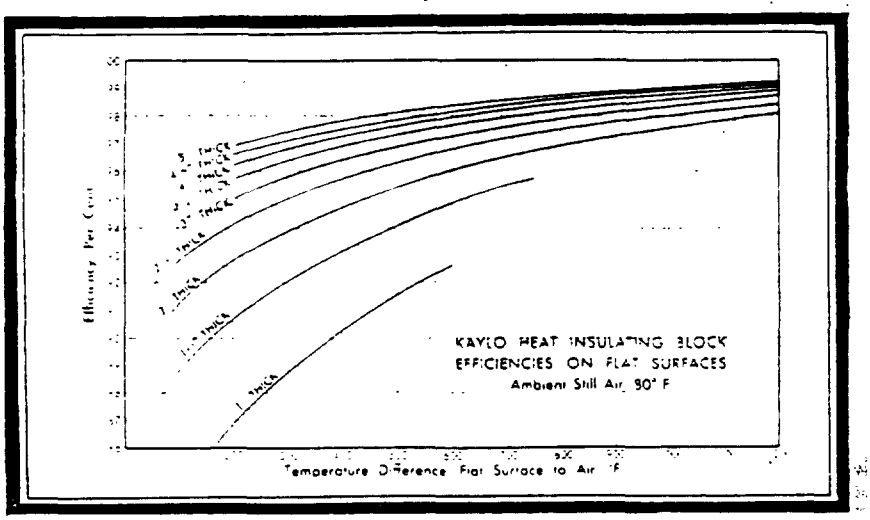
KAYLO®

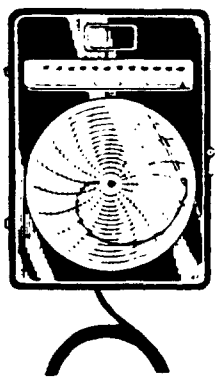
HEAT INSULATING BLOCK

Heat Loss, Surface Temperatures and Efficiencies...









Inside or outside, for large installations or small, from 0 to 1200° F., use Kaylo Heat Insulating Block to insulate:

Breechings	Lehrs
Hot Air Ducts	Autoclaves
Tanks	Ovens
Towers	Furnaces
Dryers	Turbines
Evaporators	Chilling Pits
Heat Exchangers	Boilers
Condensers	Precipitators

Locomotives

SOURCES OF TEST DATA

The data shown on these pages are supported by tests run at various laboratories, all well known to the insulation industry. They are further supported by the performance of the product in service.

●

More detailed information on Kaylo Heat Insulating Block is available on request. American Structural Products Company, Toledo 1, Ohio. Subsidiary of Owens-Illinois Glass Company.

PHYSICAL CHARACTERISTICS AT A GLANCE

DENSITY ..... Approximately 11 lb. per cu. ft.

FLEXURAL STRENGTH ..... 50 lb. per sq. in.

COMPRESSIVE STRENGTH (at 5% deformation)

Before heating ..... 150 lb. per sq. in.

After heating for 24 hours

at 750° F. ..... 144 lb. per sq. in.
at 1000° F. ..... 123 lb. per sq. in.
at 1200° F. ..... 117 lb. per sq. in.

After boiling for 24 hours (while wet) ..... 74 lb. per sq. in.

LOSS IN WEIGHT

After heating for 24 hours.

at 750° F. 5.5%
at 1000° F. 7.9%
at 1200° F. 9.8%

After boiling for 24 hours. 0.2%

RESISTANCE TO ABRASION

(Conventional Tumbling Test—Loss in weight after 10 minutes)

Before heating 2.2%

After heating for 24 hours.

at 750° F. 3.7%
at 1000° F. 5.7%
at 1200° F. 6.9%

DIMENSIONAL STABILITY

Linear Shrinkage after heating for 24 hrs.

at 750° F. 0.8%
at 1000° F. 0.9%
at 1200° F. 1.5%

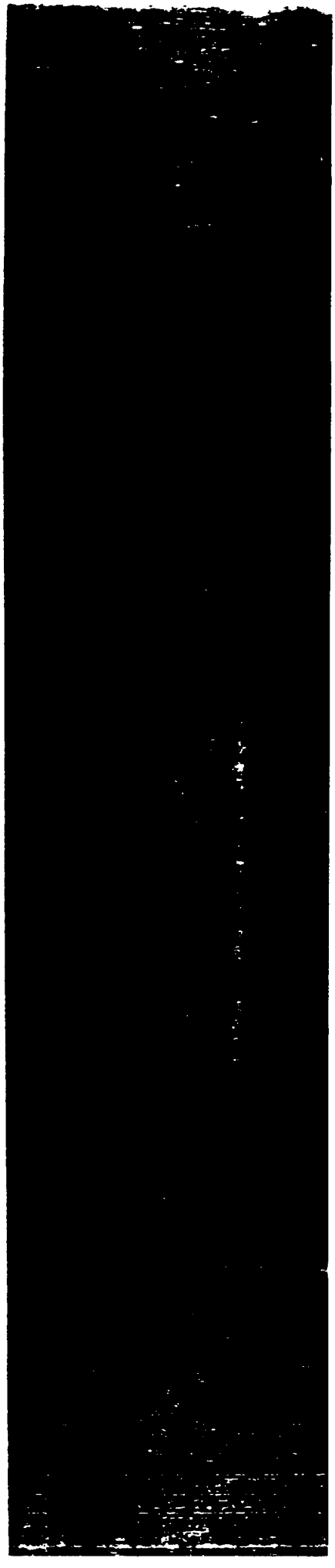
Elongation after saturation (max.) 0.4%

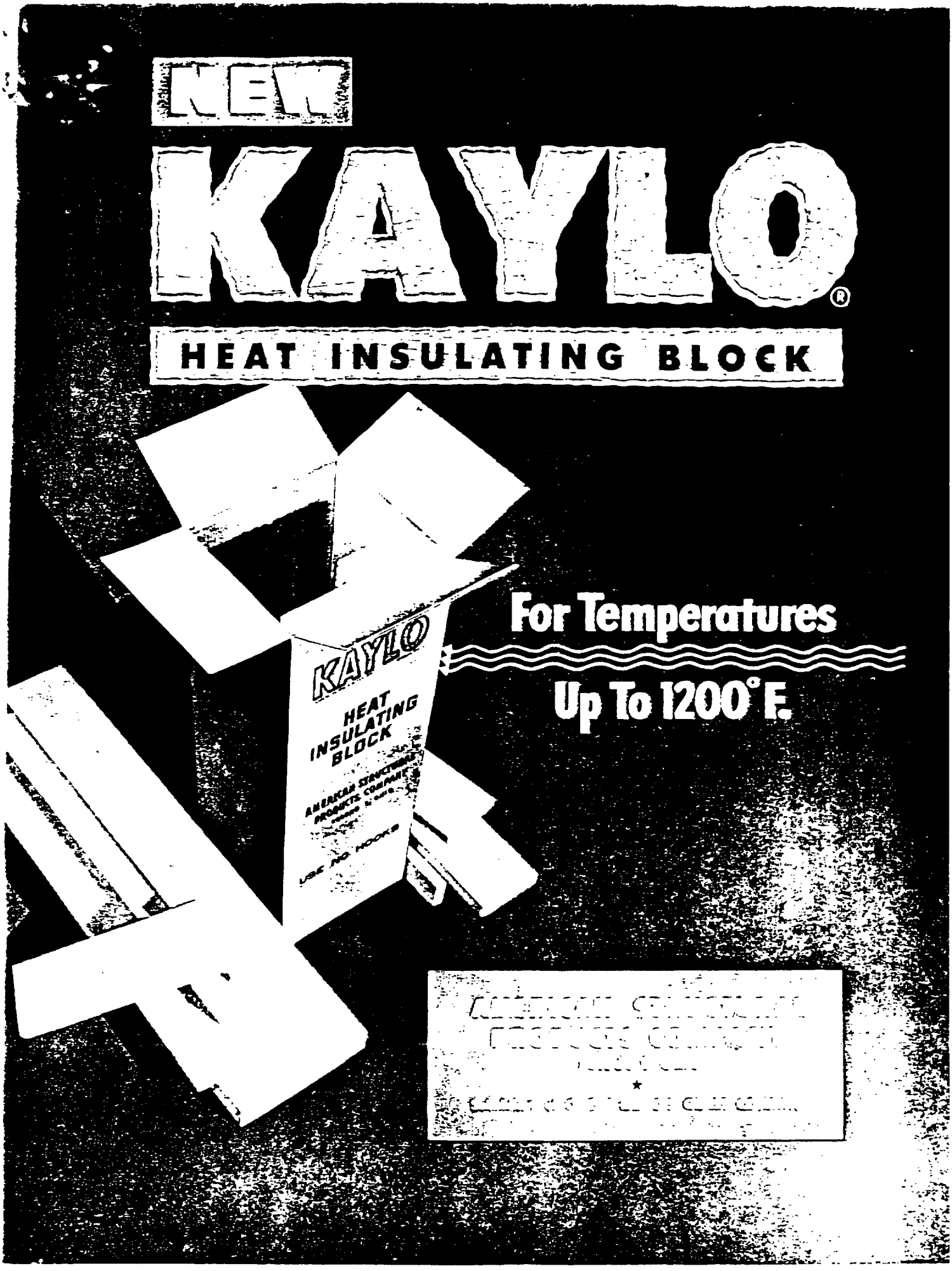
MOISTURE ABSORPTION (volume)

After 6 hours exposure in atmosphere of
120° F. and 90% Relative Humidity 0.9%

[illegible]

At 300° F. mean temperature 0.474




NEW
KAYLO®
HEAT INSULATING BLOCK
KAYLO
HEAT INSULATING BLOCK
For Temperatures
Up To 1200° F.

heat

WITH A REMARKABLE COMBINATION OF

KAYLO HEAT INSULATING BLOCK

LOW DENSITY.

LOW THERMAL CONDUCTIVITY.

Experience shows that the efficiency of Kaylo insulation improves after exposure to service temperatures

EFFECTIVE OVER WIDE TEMPERATURE RANGE

HIGH COMPRESSIVE STRENGTH.

HIGH FLEXURAL STRENGTH.

NO ADDED BINDER.

EASY TO APPLY.

Notice the clean, straight edges on these insulated pre-

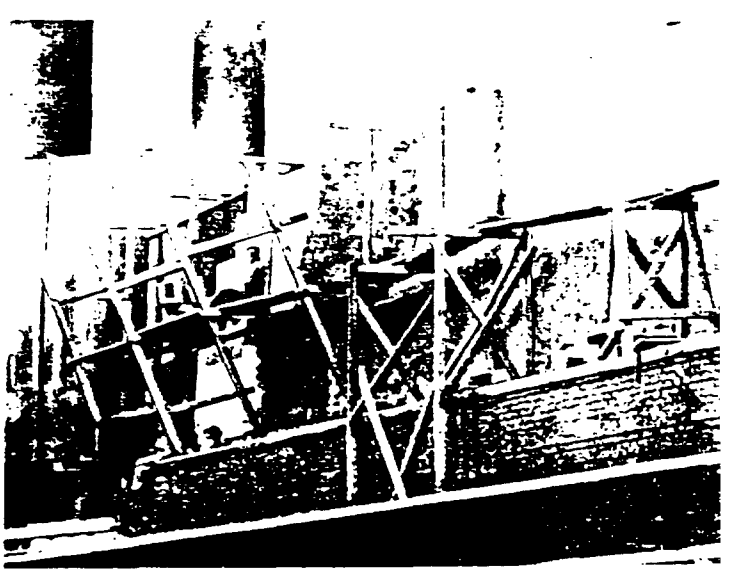
Applicators find it easy to work with Kaylo Heat Insulating Blocks because they are so easy to cut and yet have a high flexural strength.

On large or small equipment,

Insulating Blocks permit effective

maintenance. Here

pre-pitched



DVANTAGES...

LOW MOISTURE ABSORPTION. [illegible]

EFFECTIVE AFTER LONG SERVICE. [illegible]

TYPICAL APPLICATIONS:

[illegible] Heat Insulating Block to insulate

[illegible]	[illegible]	Turbines
[illegible]	[illegible]	Cooling Pits
[illegible]	[illegible]	Boilers
[illegible]	[illegible]	Precipitators
[illegible]	[illegible]	Locomotives

Navlo Heat Insulating Block [illegible] fits with flat and curved [illegible] ment pictured here. By [illegible] and keeps temperatures [illegible]

PHYSICAL CHARACTERISTICS

DENSITY

FLEXURAL STRENGTH

COMPRESSIVE STRENGTH

LOSS IN WEIGHT

RESISTANCE TO ABRASION

DIMENSIONAL STABILITY

MOISTURE ABSORPTION

CONDUCTIVITY K

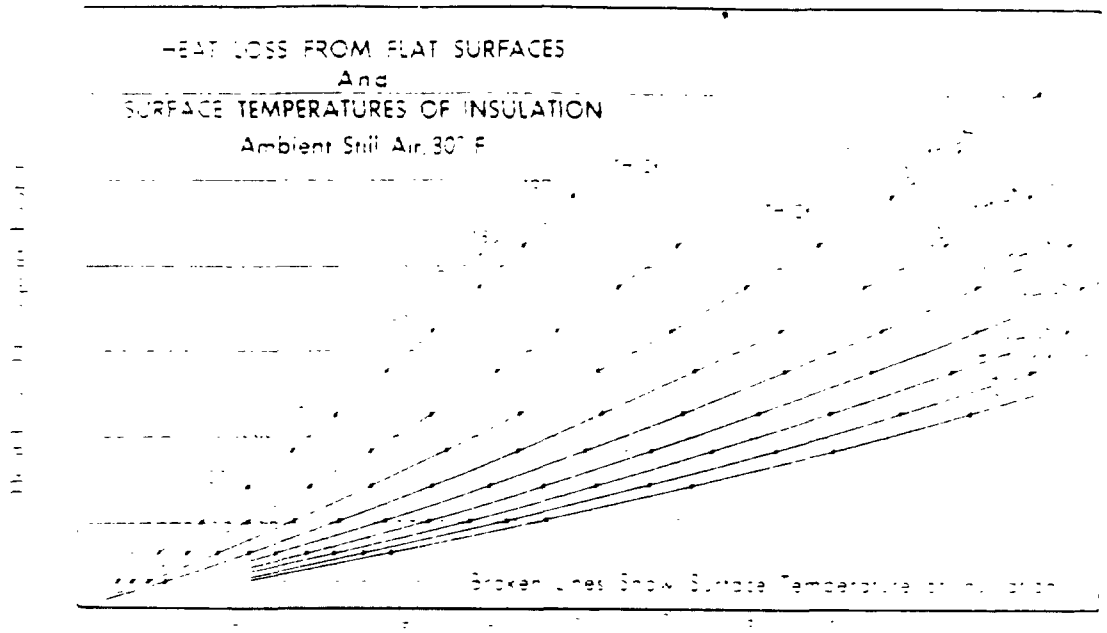
STANDARD SIZES

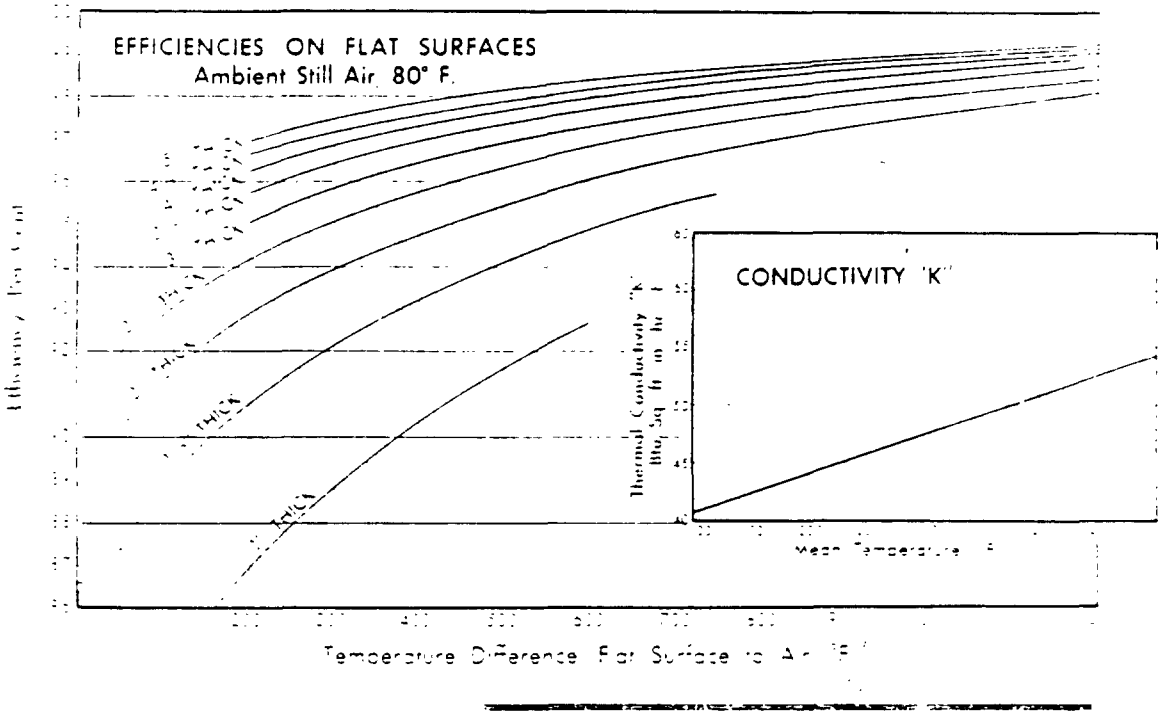
LENGTH (inches)	WIDTH (inches)	THICKNESS (inches)
36	6	1
36	6	1½
36	6	2
36	6	2½
36	6	3
36	12	1
36	12	1½
36	12	2
36	12	2½
36	12	3

other sizes are available on special orde

KAYLO HEAT INSULATING BLOCK

Heat Loss, Surface Temperatures, and Efficiencies





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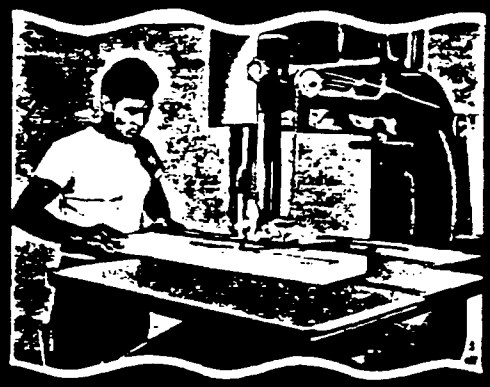
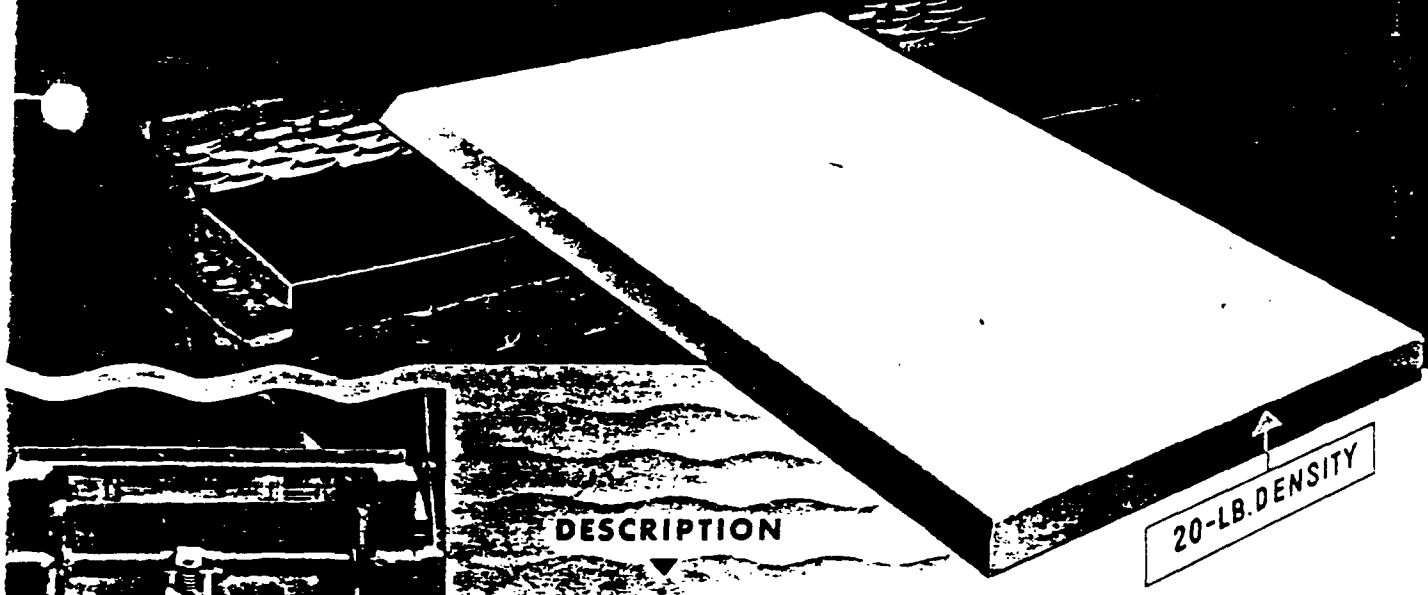
More detailed information on Kaylo Heat Insulating Block is available on request. American Structural Products Company, Toledo 1, Ohio

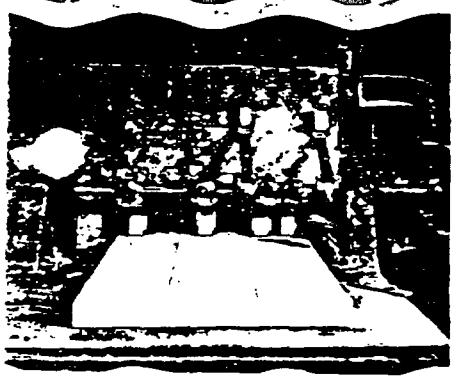


KAYLO®

20-LB. DENSITY

STRUCTURAL INSULATING BLOCK





DESCRIPTION

Kaylo Structural Insulating Block—is a near-white, rigid mineral insulating material weighing approximately 20 pounds per cubic foot. It is composed principally of calcium silicate. Except for density and for those characteristics that are changed by density it is similar to *Kaylo Heat Insulating Block*, a lightweight insulation used to insulate against heat loss from hot surfaces. Kaylo Structural Insulating Block (20-lb. density) is designed to develop maximum strength and fire resistance without sacrificing its advantages of light weight and low thermal conductivity. In fact the practical combination of these four properties—strength, weight, insulating value and fire resistance—makes it almost unique as a building material.

It weighs nominally 20 pounds to the cubic foot (actually on an oven dry basis from 19.5 to 22 lb.), has a compressive strength of approximately 500 lb. per sq. in., a "k" of 0.66 at 100 mean and outstanding resistance to the travel of heat and flame at building fire temperatures.

KAYLO® STRUCTU

USES

Kaylo Structural Insulating Block is not a finished building material in itself and is not made for exposure to the weather. Its principal uses are as a structural roof tile, or roof deck unit, in which a steel reinforcing mat is inserted at the time of forming, and as a core material. In this latter use it serves as the core of laminated structures where the faces or laminates are applied with adhesives, and also as the core of structural shells or envelopes where the Kaylo core material is simply inserted in the open spaces and held by its own contact or by such conventional methods as clips or other attachments.

In any of these applications it adds rigidity to the structure and vastly increases insulation value and fire resistance.

PHYSICAL PROPERTIES

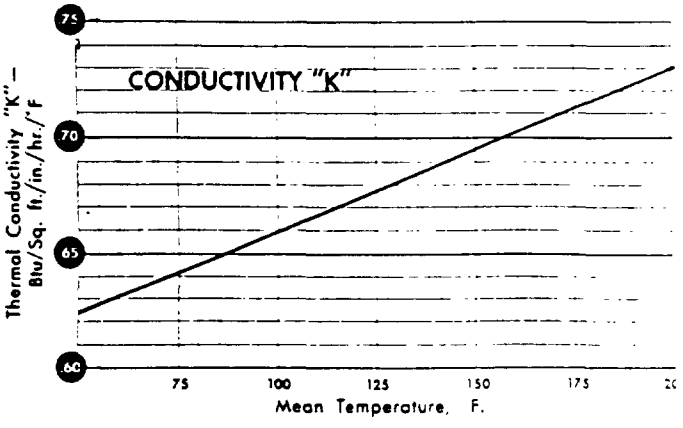
Light Weight—Nominal 20-lb. density Kaylo Block is about a third lighter than yellow pine. On an oven-dry basis it weighs from 19.5 to 22 pounds per cubic foot.

High Strength—Its compressive strength is approximately 500 lb. per sq. in. with a deformation of 5 per cent. Flexural strength is approximately 175 lb. per sq. in.

Fireproof—Kaylo 20-lb. density Structural Insulating Block has been tested at the Underwriters' Laboratories in Chicago and given the following rating, based on comparison with untreated Red Oak as 100.

Flame spread	0.0
Fuel contributed	negligible
Smoke produced	0.0

For use in fabrications that are to be Underwriters' Laboratories inspected, Kaylo Structural Insulating Block is furnished bearing the Underwriters' label for fire hazard classification for building material.

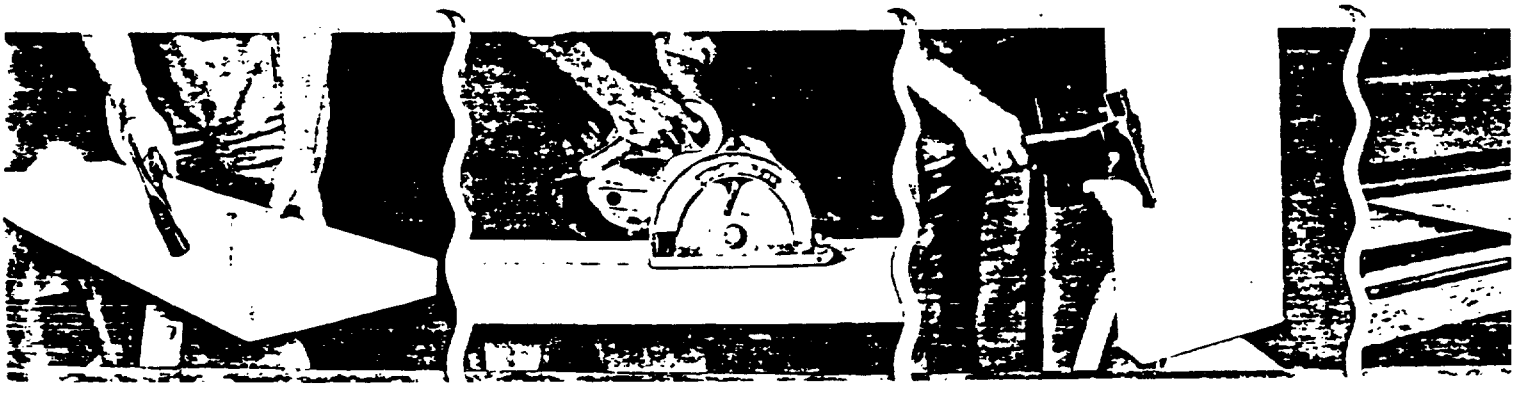


Good Insulation Value—At low mean temperatures Kaylo Structural Insulating Block is one of the most efficient structural mineral insulations. At high mean temperatures it still compares favorably with heat insulating material of its own weight.

High Light Reflectivity—Where left exposed and untreated (as with the underside of a roof deck) Kaylo Structural Insulating Block has high light reflectivity. Its light reflection factor is from 70 to 80 per cent.

Non-Abrasive Surface—Its surface is non-abrasive. It has a somewhat "soapy" feel that makes it pleasant to handle. At the same time it has a firm surface that assures good contact with surfaces applied over it.

No Added Binder—It contains no added binder, but instead constitutes its own binder. Hence its characteristics are not modified as to temperature limit, solubility, insulation value, fire resistance or otherwise by "binder limitations."



L INSULATING BLOCK (20-LB. DENSITY)

ood Workability—Kaylo Structural Insulating Block is sponsive to wood working tools. It can be sawed with a and saw or power saw, can be routed, tongue-and-ooved, sanded, and, in fact, run through most wood-orking equipment.

igh Modulus of Elasticity—The modulus of elasticity of 0-lb. density block is approximately 160,000 lb. per sq. in.

ow Specific Heat—The specific heat of Kaylo Structural nsulating Block is approximately 0.22.

ellular Structure—Kaylo Structural Insulating Block is bout 80 per cent inter-communicating air cells. The cells re extremely small, less than a micron in diameter.

ow Moisture Absorption—Kaylo Structural Block is hy-roscopic. It will absorb moisture from humid air and will each equilibrium at lower moisture contents when exposed o lower humidities. However, because of its extremely mall pore size and other characteristics, its behavior with espect to moisture differs from that of most porous ma-cr It has unusual capacity to distribute moisture vit its mass, and to give it off to surrounding air of ower moisture content.

ts moisture absorption when surrounded by humid air s low. Test specimens dried for 24 hours at 215° F., cooled nd then exposed on all surfaces to an atmosphere of 90 er cent relative humidity and a temperature of 120° F. r six hours, absorbed less than one per cent of moisture volume.

onsistent with the common practice for good construc-on involving porous insulating materials of high internal rface area, Kaylo Structural Insulating Block should sealed against moisture on the warm side when it is bjected to extremely low temperatures.

High Wet Strength—Kaylo Structural Insulating Block, like most other insulating materials, is not intended to serve immersed in water or exposed to extremely damp or humid conditions, yet its flexural strength when wet (immersed 10 hours) is reduced only about 15 per cent.

Dimensionally Stable—The dimensions of Kaylo Structural Insulating Block change little with changes in moisture content. Experience has shown from the manufacture of thousands of units of laminated structures that they have unusual dimensional stability and unusual freedom from warping.

Available with and without Reinforcing—In the form of roof tile Kaylo Structural Insulation is available with a steel reinforcing mat. In the form of core material for various types of structure it is available without reinforcing.

Accepts Nails and Screws—Both nails and screws can be used with Kaylo Structural Block. Tables showing holding power of both are available on request. Nails should be of the cement-coated type without barbs that abrade the sides of the opening they make as they are driven into the block. Galvanized or non-ferrous nails may be used where greater resistance to corrosion is required. Screws may be inserted either with or without drilling a pilot hole.

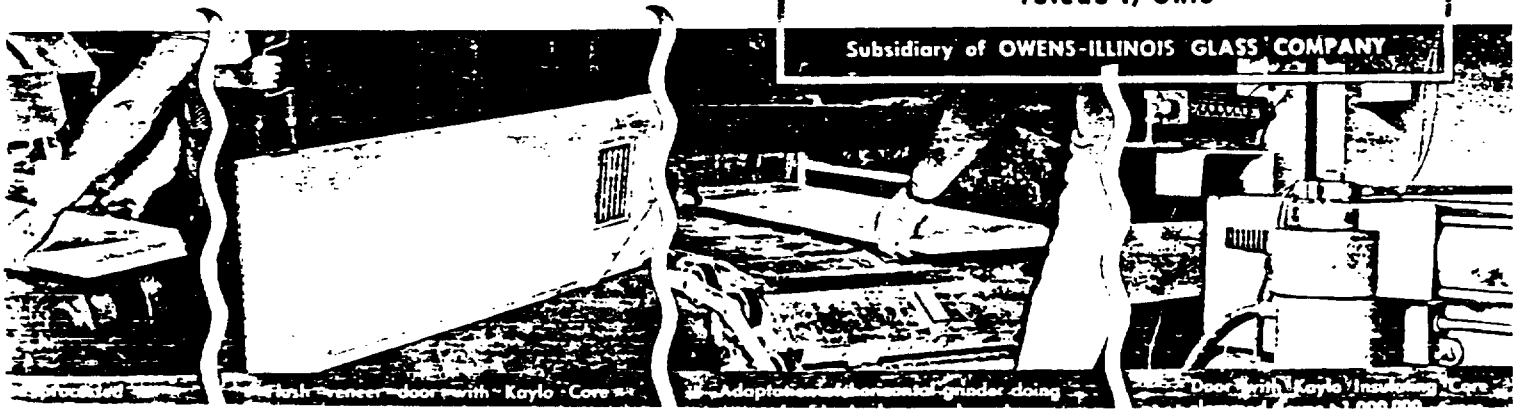
Sizes—Kaylo Structural Insulating Block is made in a standard size of 18 x 36 inches.

Since most uses involve manufacturing operations, thicknesses that are practical can best be worked out with the manufacturer of Kaylo Insulating Products after approximate quantities needed are known. These will usually be between one and two inches thick.

Certain thicknesses are suggested by certain building requirements. A thickness of from $1\frac{3}{4}$ to 2 inches of Kaylo Structural Insulating Block is required to withstand a typical building fire for one hour—usually somewhat more for a partition than for a door because of the greater performance required of a partition.

20-Lb. and 11-Lb. Density Block Can Be Used in Combination. Where two thicknesses of insulation are used to build up an insulating structure it is possible to use the two densities in combination to develop the best insulation value strength and fire resistance.

AMERICAN STRUCTURAL PRODUCTS COMPANY
Toledo 1, Ohio
Subsidiary of OWENS-ILLINOIS GLASS COMPANY



LAMINATION

amination over a Kaylo Insulating Core—Almost any face material may be bonded to Kaylo Structural Insulating Block surfaces. Bonding agents can be selected to meet the requirements of the particular facing—also to satisfy the service requirements of the finished product—and still offer some choice in curing procedures.

Some adhesives which may be used with various types of face materials are listed below. This list is not intended to be complete. Its only purpose is to identify a partial list of adhesives. These have been found to provide a tensile strength of 35 lb. per sq. in. and a minimum shear strength of 100 lb. per sq. in. when cured in the manner indicated.

ADHESIVES FOR JOINING KAYLO STRUCTURAL INSULATING BLOCK TO:

Wood Veneer	Aluminum	Stainless Steel
Durite No. 3026A (A) 3026AWH207 3026AWF	Durite No. 3026A (A)	Durite No. 3026 (A) No. A, NH267
Penacolite G1131 (A)	Pecora 718 (E)	N100 (C)
Pecora 718 (E)	Weldwood (A)	3 MEC 826 (C D E)
Catabond 720 (A)	Insalute No. 1 (A)	Weldwood (A)
Vinylseal MA 28-18 (E)	Interlake 4162 (C D)	Insalute No. 1 (A)
Amberlite PR14 (D)	Vulcalock (A B)	Interlake 4162 (C D)
Bostik 7026 (D)	Dupont 4653 (C D E)	Vulcalock (A B)
Redux (D)	Dupont 4646 (C D E)	Dupont 4653 (C D E)
Synco X-8348 (D) — 130LW (DW)	G. E. 2142 (C)	Dupont 4646 (C D E)
	G. E. 7031 (C)	G. E. 2142 (C)
	Vinylseal MA 28-18 (E)	G. E. 7031 (C)
	Amberlite PR14 (D)	Vinylseal MA 28-18 (E)
	Bostik EXE 138 (D)	Amberlite PR14 (D)
	Redux (D)	Bostik 7026 (D)
		Sodium Silicate (A)
		Redux (D)

ADHESIVES FOR JOINING LIKE MATERIALS:

Insulating Block to Insulating Block	Aluminum to Aluminum	Stainless Steel to Stainless Steel
Durite 3026A (A)	Vulcalock (A B)	Dupont 4653 (C D E)
Penacolite G1131 (A)	Dupont 4653 (C D E)	G. E. 7031 (C)
Weldwood (A)	Dupont 4646 (C D E)	Bostik 7026 (D)
Insalute 1 (A)	G. E. 7031 (C)	Bostik EXE 138 (D)
G. E. 2142 (C)	Bostik 7026 (D)	Redux (D)
Plaskon 911 (C D)	Bostik EXE 138 (D)	
Selectron 5003 (E)	Redux (D)	
Vinylseal MA 28-18 (E)		
Amberlite PR14 (D)		
Bostik 7026 (D)		
Bostik EXE 138 (D)		
Sodium Silicate (A)		
Redux (D)		
Synco X-8348 + 130LW (DW)		

Symbols for method of cure:
For Maximum Strength

- **(A) Clamped at room temperature for 24 hours.**
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- **(C) Placed in press at 10 p.s.i. at 300° F. for 10-30 minutes.**
- **(D) Placed in press at 100 p.s.i. at 300° F. for 10-30 minutes.**
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AMERICAN STRUCTURAL PRODUCTS COMPANY
TOLEDO 1, OHIO
Subsidiary of OWENS-ILLINOIS GLASS COMPANY

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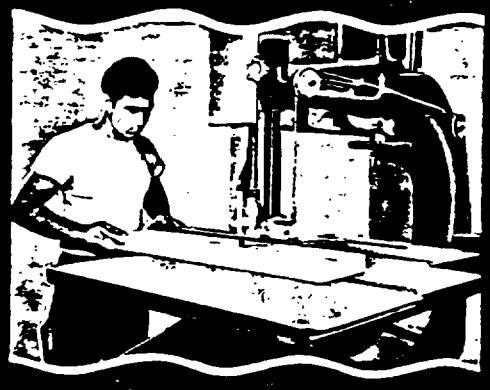
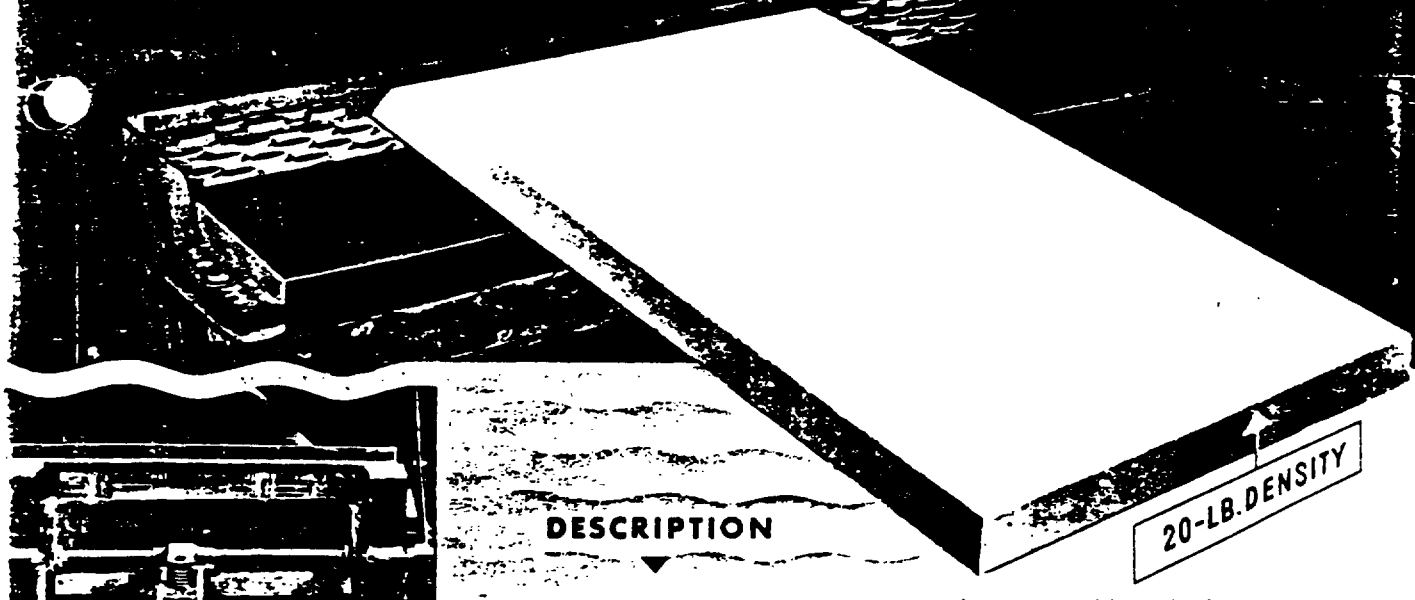
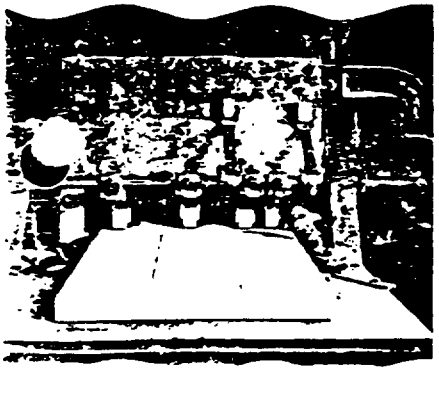


KAYLO®

20-LB. DENSITY
STRUCTURAL INSULATING BLOCK





DESCRIPTION

Kaylo Structural Insulating Block—is a near-white, rigid mineral insulating material weighing approximately 20 pounds per cubic foot. It is composed principally of calcium silicate. Except for density and for those characteristics that are changed by density it is similar to *Kaylo Heat Insulating Block*, a lightweight insulation used to insulate against heat loss from hot surfaces. Kaylo Structural Insulating Block (20-lb. density) is designed to develop maximum strength and fire resistance without sacrificing its advantages of light weight and low thermal conductivity. In fact the practical combination of these four properties—strength, weight, insulating value and fire resistance—makes it almost unique as a building material.

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KAYLO®

20-LB. DENSITY

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Light Weight—Nominal 20-lb. density Kaylo Block is about a third lighter than yellow pine. On an oven-dry basis it weighs from 19.5 to 22 pounds per cubic foot.

High Strength—Its compressive strength is approximately 500 lb. per sq. in. with a deformation of 5 per cent. Flexural strength is approximately 175 lb. per sq. in.

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Flame spread	0.0
Fuel contributed	negligible
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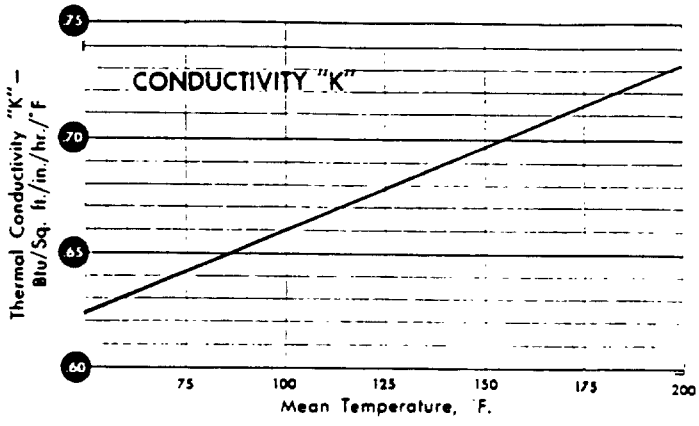

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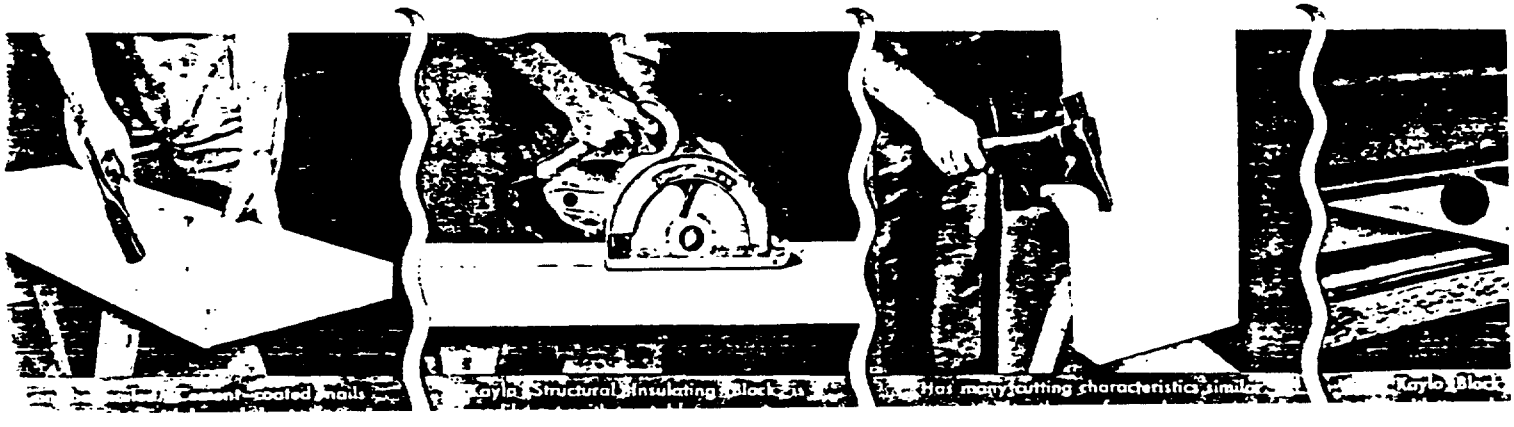

STRUCTURAL INSULATING BLOCK

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Low Specific Heat—The specific heat of Kaylo Structural Insulating Block is approximately 0.22.

Cellular Structure—Kaylo Structural Insulating Block is about 80 per cent inter-communicating air cells. The cells are extremely small, less than a micron in diameter.

Low Moisture Absorption—Kaylo Structural Block is hygroscopic. It will absorb moisture from humid air and will reach equilibrium at lower moisture contents when exposed to lower humidities. However, because of its extremely small pore size and other characteristics, its behavior with respect to moisture differs from that of most porous materials. It has unusual capacity to distribute moisture within its mass, and to give it off to surrounding air of lower moisture content.

Its moisture absorption when surrounded by humid air is low. Test specimens dried for 24 hours at 215° F., cooled and then exposed on all surfaces to an atmosphere of 90 per cent relative humidity and a temperature of 120° F. for six hours, absorbed less than one per cent of moisture by volume.

Consistent with the common practice for good construction involving porous insulating materials of high internal surface area, Kaylo Structural Insulating Block should be sealed against moisture on the warm side when it is subjected to extremely low temperatures.

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Since most uses involve manufacturing operations, thicknesses that are practical can best be worked out with the manufacturer of Kaylo Insulating Products after approximate quantities needed are known. These will usually be between one and two inches thick.

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Kaylo Division
OWENS-ILLINOIS GLASS COMPANY
Toledo 1, Ohio

LAMINATION

.amination over a Kaylo Insulating Core—Almost any face material may be bonded to Kaylo Structural Insulating Block surfaces. Bonding agents can be selected to meet the requirements of the particular facing—also to satisfy the service requirements of the finished product—and still offer some choice in curing procedures.

Some adhesives and primers which may be used with various types of face materials are listed below. (This list is not intended to be complete. Its only purpose is to identify a partial list of adhesives. An adhesive not listed does not imply that it is not suitable. These have been found to provide a tensile strength of 35 lb. per square inch and a minimum shear strength of 100 lb. per square inch when cured according to the manufacturer's recommendation. They are not listed in the order of their adhesive strength.)

ADHESIVES AND PRIMERS FOR JOINING KAYLO STRUCTURAL INSULATING BLOCK TO:

Wood Veneer or Paper or Plastics		Steel, Stainless Steel Galvaneal, or Aluminum		Kaylo Insulating Block or Cement-Asbestos Board	
Durite No. 3026A	A	Durite No. 3026A or No. A NH267	A	Durite 3026A	A
Penacolite G1131	A	N100	E	Penacolite G1131	A
Pecora 718	E	Pecora 718	C	Armstrong J 1162	D
Catabond 720	A	3MEC 826	C D E	Insalute 1	A
Vinylseal MA 28-18	E	Penacolite G1131	A	G.E. 2142	C
Amberlite PR 14	D	Insalute No. 1	A	Selectron 5003	E
Bostik 7026	D	Interlake 4162	C D	Vinylseal MA 28-18	E
Redux	D	Vulcolock	A B	Amberlite PR-14	D
Synco S-8348+130LW (DW)	D	DuPont 4653	C D E	Bostik 7026	D
Resorsabond R-12	A	DuPont 4646	C D E	Bostik EXE 138	D
Armstrong J-1162	D	Resorsabond R-12	A	Sodium Silicate	A
Tego	D	G.E. 2142	C	Redux	D
		G.E. 7031	C	Synco X-8348+130LW (DW)	D
		Bostik 7026	D	Resorsabond R-12	A
		Bostik EXE 138	D	Tego	D
		Bostik 1007	A		
		Vinylseal MA 28-18	E		
		Amberlite PR-14	D		
		Redux	D		
		Armstrong J-1162	D		

Symbols for method of cure:
For Maximum Strength

- **A** Clamped at room temperature for 24 hours.
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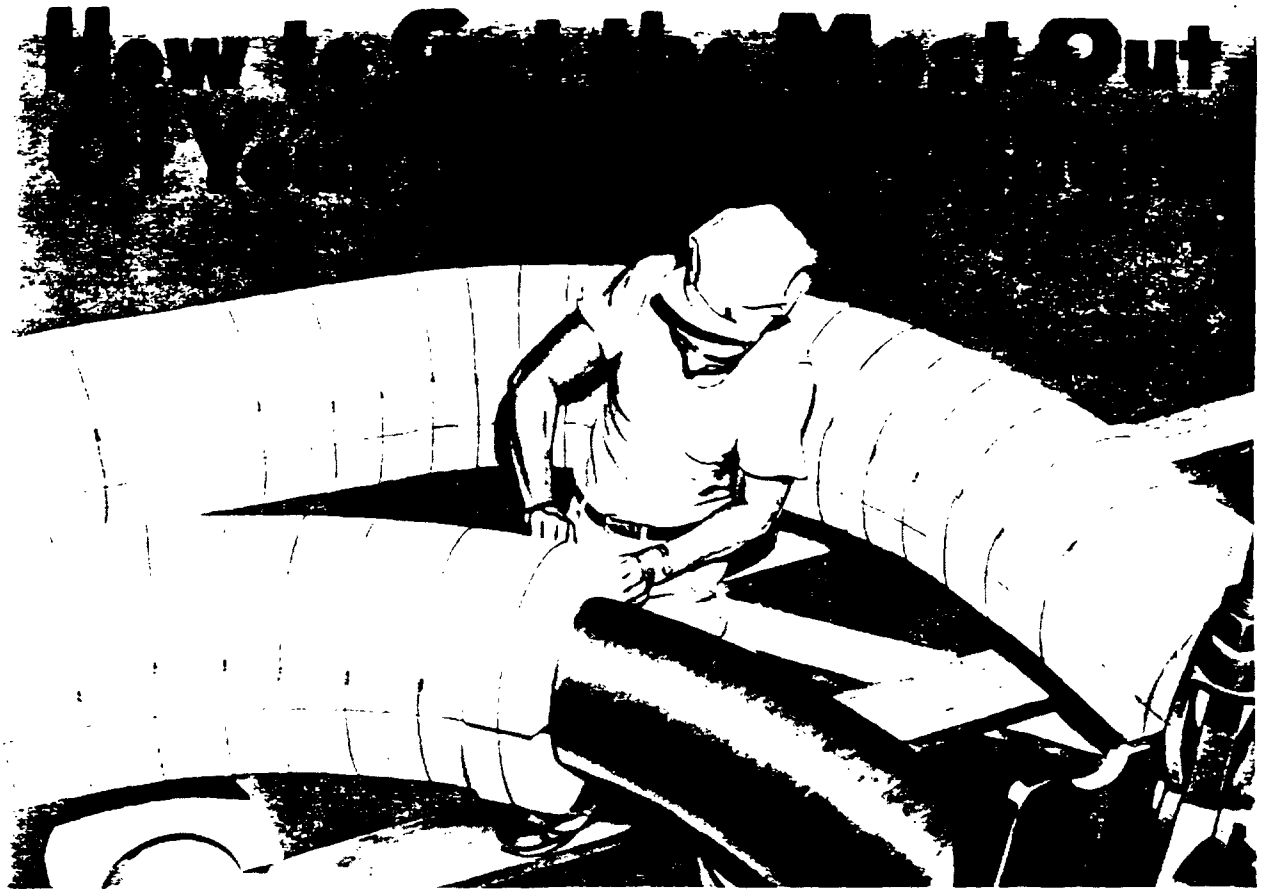
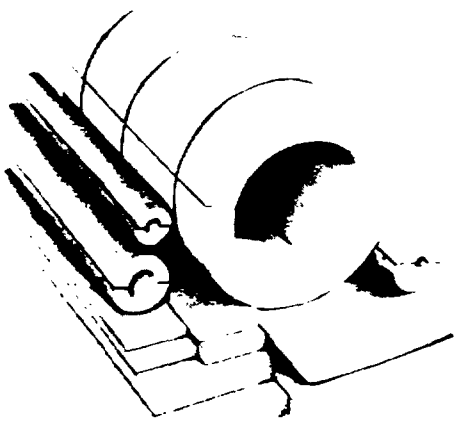
- **C** Placed in press at 10 p.s.i. at 300° F. for 10-30 minutes.
- **D** Placed in press at 100 p.s.i. at 300° F. for 10-30 minutes.
- **E** Clamped in oven at 250° F. for 10-30 minutes.

High-frequency curing has been tried successfully on an experimental basis with wood, aluminum and stainless steel bonded to a Kaylo insulating core. Many of the manufacturers making the above listed adhesives can provide adhesives suitable for high-frequency curing.

Kaylo Division
OWENS-ILLINOIS GLASS COMPANY
Toledo 1, Ohio



The Right Material... Expert Application



First, Kaylo Heat Insulation is *proved* a *better* material hydrous calcium silicate. Its light weight, strength, water-insolubility, low conductivity and wide temperature range give you extra advantages *at no extra cost.*

Second, Kaylo distributors have the technical knowledge and experience to provide you with a complete insulating service. Their trained applicators are skilled craftsmen who do neat and efficient installation.

To be *sure* of getting the most out of your insulating dollars for your next job, call the nearest Kaylo distributor. Chances are you can find him listed in the yellow pages of your phone book. If not contact us and we'll give you his name.

WRITE FOR FREE BOOK—"Kaylo Heat Insulation." Address: Dept. N-370, Owens-Illinois Glass Company, Kaylo Division, Toledo 1, Ohio.

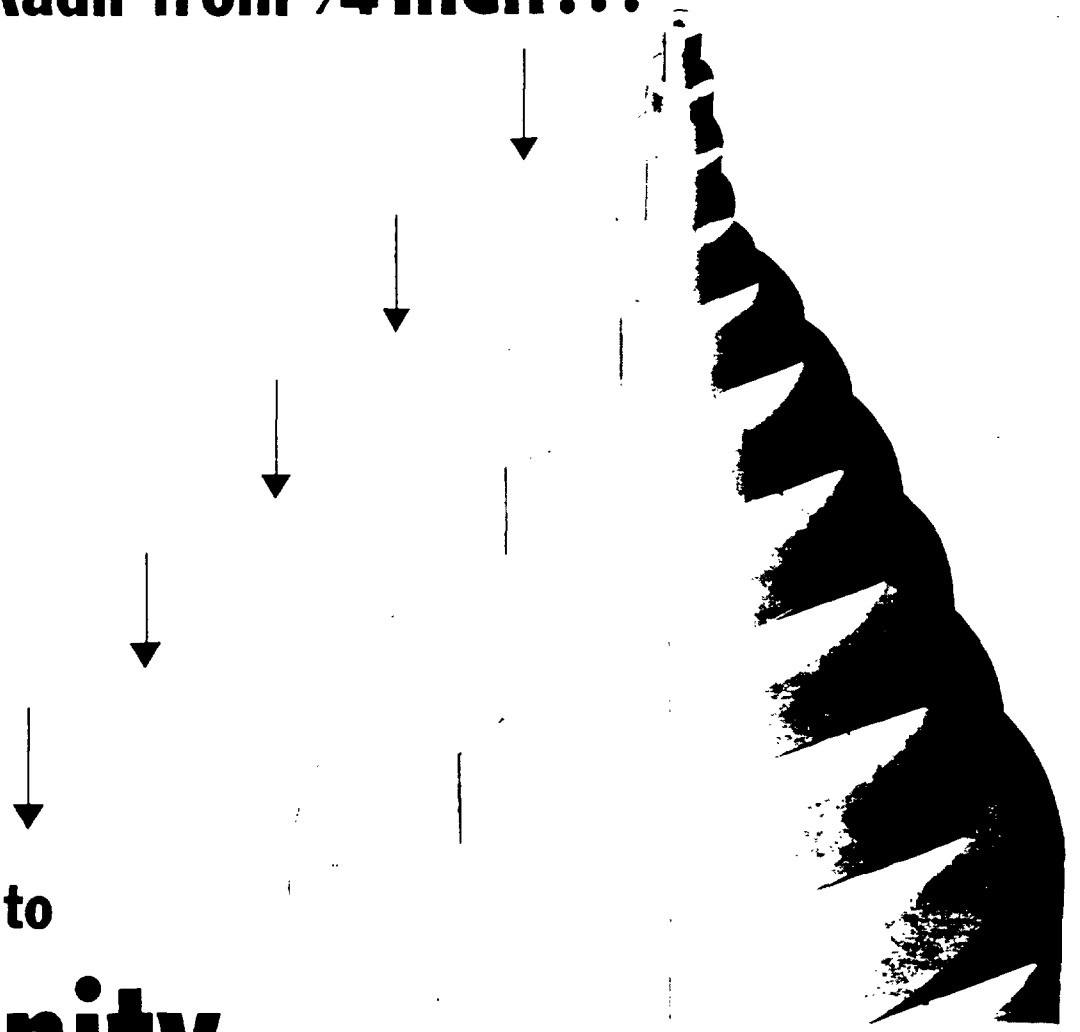
KAYLO ... *first in calcium silicate*

...*pioneered by* OWENS (I) ILLINOIS Glass Company

MAIN OFFICE: TOLEDO 1, OHIO—KAYLO SALES OFFICES: ATLANTA • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA • PITTSBURGH • ST LOUIS

Owens-Illinois Glass Company—Kaylo Division
Advertisement No. K 153, appearing in the following publications:
Chemical Engineering Jan., 1953
Oil & Gas Journal Jan. 12, 1953
Plant Engineering Jan., 1953
Power—Jan., 1953
Petroleum Refiner Feb., 1953
Chemical Processing Feb., 1953
Combustion Feb., 1953
Industry & Power Feb., 1953

For Radii from ¼ Inch...



to

Infinity...

Nesting Kaylo Heat Insulation Requires Fewer Pieces Per Job

The complete range of Kaylo Insulation includes pipe covering in Simplified Dimensional Standards for diameters from ¼ in. to 72 in., curved block from 72 in. to 60 ft. and flat block for surfaces of less curvature whose radii approach infinity. With its wide selection of interchangeable sizes and shapes, Kaylo Insulation reduces the number of items needed per job and permits substantial savings in warehousing maintenance stock.

WRITE FOR FREE BOOK—"Kaylo Heat Insulation."
Address: Dept. N-371, Owens-Illinois Glass Company, Kaylo Division, Toledo 1, Ohio.

KAYLO® ... *first in calcium silicate*

...*pioneered by* OWENS (I) ILLINOIS **Glass Company**

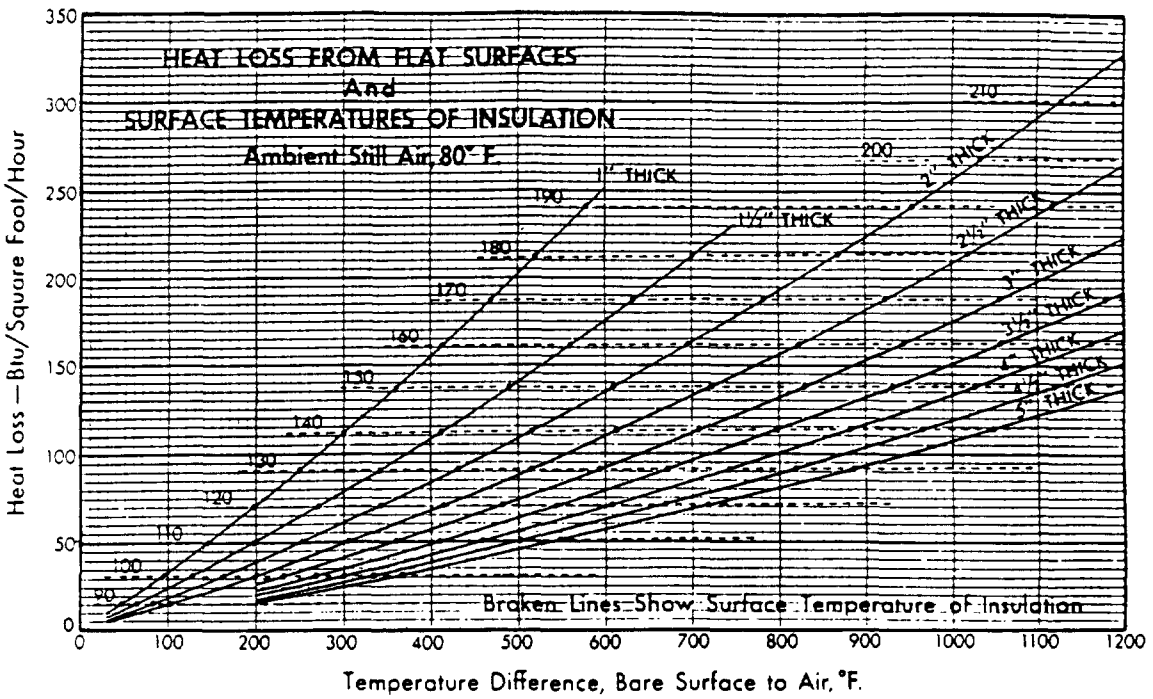
MAIN OFFICE: TOLEDO 1, OHIO—KAYLO SALES OFFICES: ATLANTA • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA • PITTSBURGH • ST LOUIS

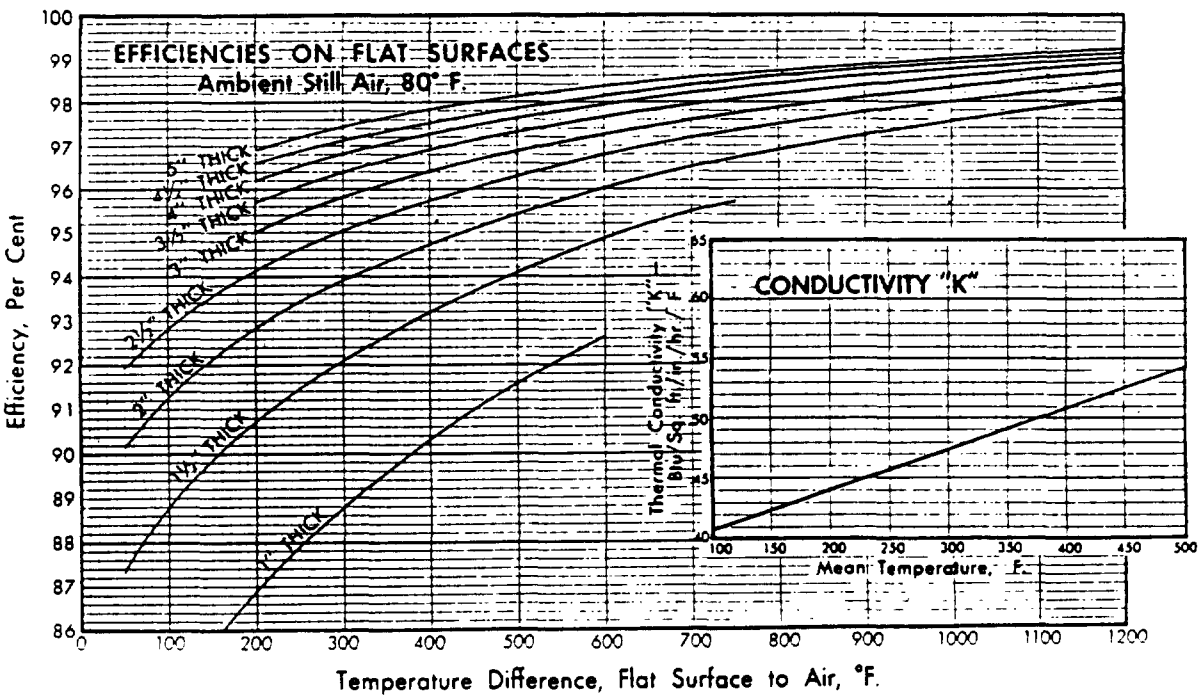
Owens-Illinois Glass Company
Advertisement No. K-154—appearing in the following publications:
Plant Engineering—March, 1953
Oil & Gas Journal—March 23, 1953
Chemical Engineering—March, 1953
Chemical Processing April, 1953
Petroleum Refiner May, 1953

KAYLO®

HEAT INSULATING BLOCK

Heat Loss, Surface Temperatures, and Efficiencies





SOURCES OF TEST DATA: The data shown on these pages are supported by tests run at various laboratories, all well known to the insulation industry. They are further supported by the performance of the product in service.

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More detailed information on Kaylo Heat Insulating Block is available on request. American Structural Products Company, Toledo 1, Ohio.

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DVANTAGES...

ıake a good-looking installation. Their "feel" is leasant and non-irritating. They can be cut, scored nd sawed with ordinary woodworking tools. Finishes hat go over the block, whether cement, cloth or other ypes, can be applied smoothly and with a minimum f effort. No special tools are needed.

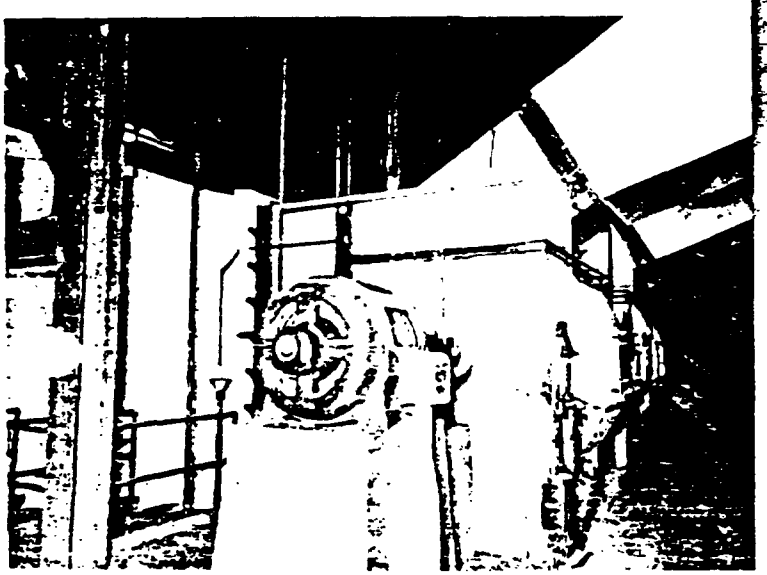
.OW MOISTURE ABSORPTION. Kaylo Heat Insulating Block absorbs little moisture from surrounding ıumid air.

EFFECTIVE AFTER LONG SERVICE. Kaylo Heat Insulating Block remains strong, free from excessive powdering, and shows little loss in weight or shrinkage after long application to temperatures up to 1200° F. Even conventional tumbling tests, run after prolonged heating, produce relatively little crumbling or breakdown of the material.

TYPICAL APPLICATIONS:

In : or outside, for large installations or small, up to 1200° F., use Kaylo Heat Insulating Block to insulate:

Breechings	Heat Exchangers	Turbines
Hot Air Ducts	Condensers	Chilling Pits
Tanks	Lehrs	Boilers
Towers	Autoclaves	Precipitators
Dryers	Ovens	Locomotives
Evaporators	Furnaces	



Kaylo Heat Insulating Block covers both flat and curved surfaces on the power house equipment pictured here. By minimizing heat loss, it saves fuel and keeps temperatures within the room at comfortable levels.

PHYSICAL CHARACTERISTICS

DENSITY	Approximately 11 lb. per cu. ft.
FLEXURAL STRENGTH	50 lb. per sq. in.
COMPRESSIVE STRENGTH (at 5% deformation)	
Before heating	150 lb. per sq. in.
After heating for 24 hours	
at 750° F.	144 lb. per sq. in.
at 1000° F.	123 lb. per sq. in.
at 1200° F.	117 lb. per sq. in.
After boiling for 24 hours (while wet)	74 lb. per sq. in.
LOSS IN WEIGHT	
After heating for 24 hours	
at 750° F.	5.5%
at 1000° F.	7.9%
at 1200° F.	9.8%
After boiling for 24 hours (after drying)	0.2%
RESISTANCE TO ABRASION	
(Conventional tumbling test-loss in weight after 10 minutes)	2.2%
Before heating	3.7%
After heating for 24 hours	
at 750° F.	5.7%
at 1000° F.	6.9%
at 1200° F.	
DIMENSIONAL STABILITY	
Linear shrinkage after heating for 24 hours	
at 750° F.	0.8%
at 1000° F.	0.9%
at 1200° F.	1.5%
Elongation after saturation (max.)	0.04%
MOISTURE ABSORPTION (volume)	
After 6 hours exposure in atmosphere of 120° F. and 90% Relative Humidity	0.9%
CONDUCTIVITY (K)	
At 100° F. mean temperature	0.41
At 500° F. mean temperature	0.54

STANDARD SIZES

LENGTH (inches)	WIDTH (inches)	THICKNESS (inches)
36	6	1
36	6	1½
36	6	2
36	6	2½
36	6	3
36	12	1
36	12	1½
36	12	2
36	12	2½
36	12	3

other sizes are available on special order

A.I.A. File No. 16

A Product of OWENS-ILLINOIS GLASS COMPANY

Manufactured by THE KAYLO DIVISION

The KAYLO FIREDOOR

Sets New Standards

Here is a really unique door. The Kaylo Firedoor is the only type of wood-faced door that carries a one-hour fire rating from Underwriters' Laboratories, Inc.—official testing agency for the National Board of Fire Underwriters.

Many other important advantages are combined in the Kaylo Firedoor:

- **Great Dimensional Stability**—A Kaylo Firedoor does not warp, swell or shrink—even when subjected to extremes of heat or cold, dampness or dryness.
- **High Insulation Value**—Installed in an exterior opening with weather stripping, the Kaylo Firedoor insulates more effectively than a conventional door, *plus* a storm door.
- **Light Weight plus Strength**—A standard 3'4" x 7' Kaylo Firedoor weighs only 90 lbs., but can support an 8,000-lb. distributed load with only one-half inch deflection while loaded. After unloading, the door returns to its original position.
- **Handsome Appearance**—The wood veneer-faced Kaylo Firedoor equals the richness of the most striking conventional wood doors. It offers rated fire protection, without sacrifice in beauty.

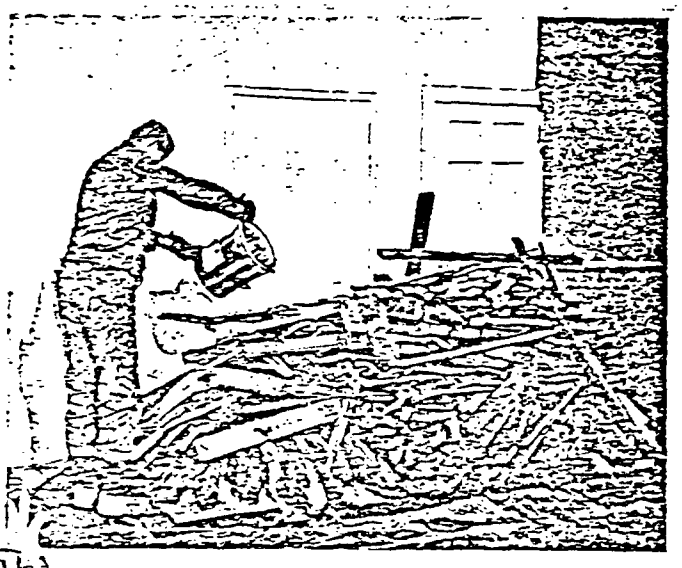
THE INORGANIC KAYLO CORE

Heart of the Kaylo Firedoor is its core—a chemical composition which is completely inorganic. It does not burn. It is rot-proof and vermin-proof, permanently resistant to termites, cannot be damaged by water. The Kaylo core material has a nominal density of 20 lbs. per cubic foot, and is sufficiently sturdy to insure proper performance of the Kaylo Firedoor under most severe conditions.

Kaylo Firedoors offer a great combination of advantages for hospitals, schools, apartment houses, hotels, office buildings—and residences.

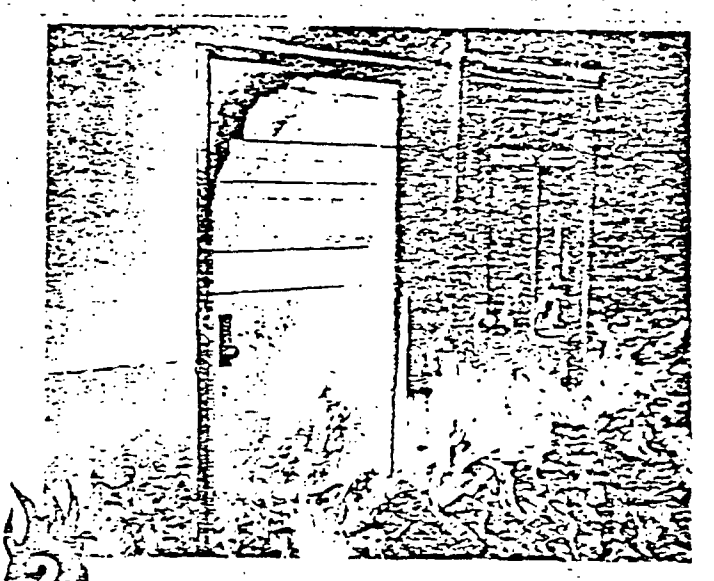
This label on doors which you specify or install means rated fire protection, safety and reduced insurance rates for building owners. It appears on every Kaylo-core door.

Beauty and Stability with Fire Protection



1

To test comparative fire-resistance, a Kaylo Firedoor and conventional wood door, set side by side in a concrete wall, are exposed simultaneously to fire.

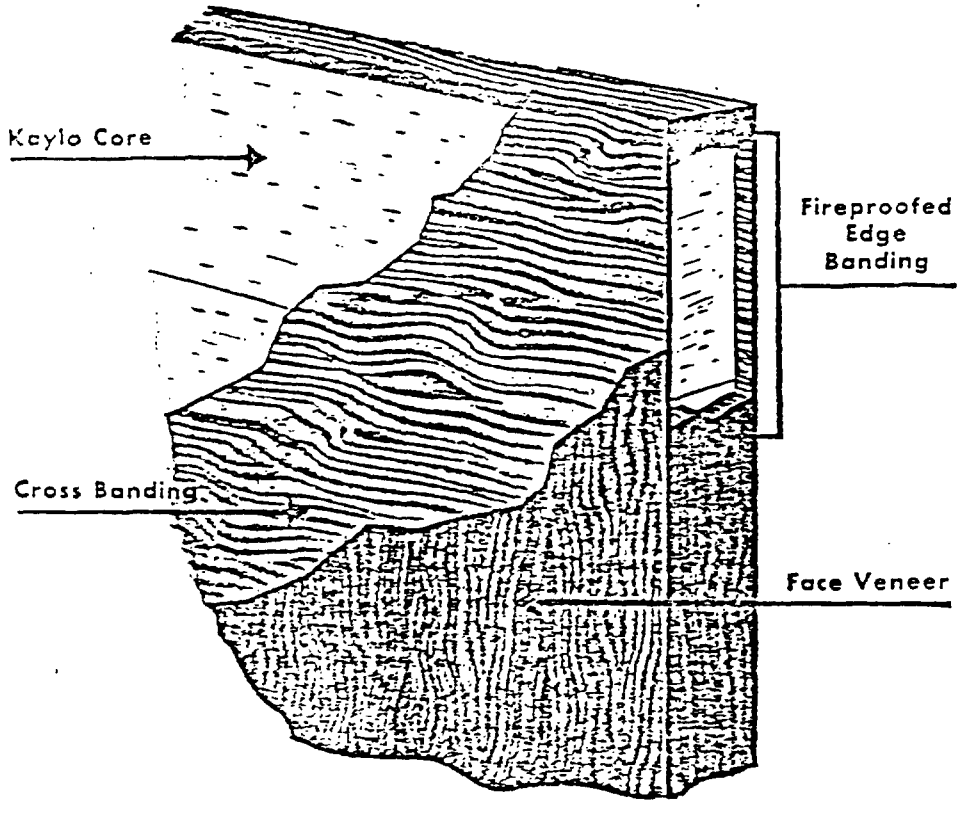


2

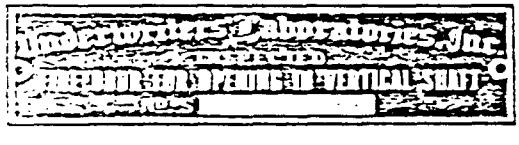
The fire is set in a wood pile, soaked with 40 gallons of fuel oil. Here's how the two doors looked on the "hot side" after less than 10 minutes.

3

On the opposite side of the wall, flames lick through the conventional wood door. But the Kaylo Firedoor has completely checked the fire and most of the heat as well. Note the men touching the Kaylo Firedoor with their bare hands.



"INSIDE VIEW" SHOWS UNIQUE FEATURES OF THE KAYLO FIREDOOR'S CONSTRUCTION



Look for this metal label on the hinge edge near the top of every Kaylo Firedoor. It is evidence that Underwriters' Laboratories, Inc., have given the door a one-hour fire rating for Class B and C openings.

Fireproofed Edge Banding—All four edges of the Kaylo Firedoor are banded with strips of solid hardwood, which has been treated with Protexol Class A fireproofing agent.

Cross Banding—Veneer cross bandings are bonded to the door's Kaylo core with waterproof phenolic glue.

Kaylo Core—The core is made up of closely fitted sections of inorganic Kaylo material, which have been joined together with tongue-and-groove edges as prescribed by Underwriters' Laboratories, Inc.

Face Veneer—Available in several domestic woods, the face veneer is bonded to cross bandings with waterproof phenolic glue.

OWENS-ILLINOIS GLASS COMPANY

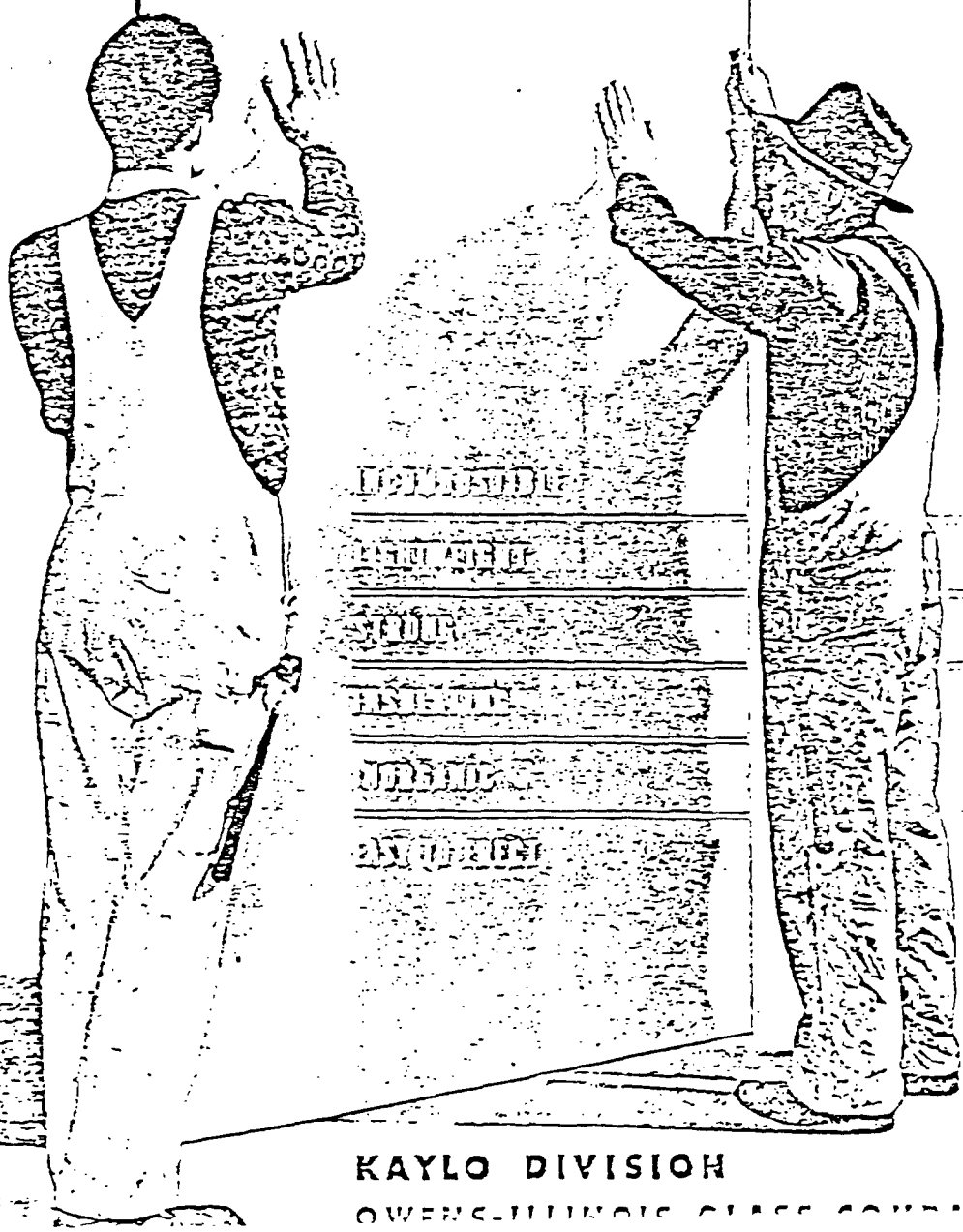
Kaylo Division • Toledo 1, Ohio

ATLANTA • BOSTON • BUFFALO • CINCINNATI • CHICAGO

New KAYLO®

LAMINATED PANELS

WITH CEMENT-ASBESTOS FACING



KAYLO DIVISION

OWENS-ILLINOIS GLASS COMPANY

A. I. A. File No. 17-A

TABLE OF CONTENTS

KAYLO®
LAMINATED PANELS
WITH CEMENT-ASBESTOS FACING

Introduction of the calcium-silicate insulating material, sold in various forms under the brand name "Kaylo," has opened up an entirely new field of laminated building products. This inorganic material is used as a core in panels faced with wood veneer, plastics, metal and (as described in this booklet) cement-asbestos board. For each laminated product, it provides a core which is incombustible, lightweight and strong and offers insulating value and exceptional dimensional stability. Kaylo cores are being used in a number of laminated products, now on the market, in which fire resistance is a prime consideration. These include firedoors, wall panels and marine bulkheads.

Kaylo Laminated Panels with cement-asbestos facing provide complete curtainwall or non-loadbearing partition sections which require no finishing on either side—no painting, furring, plastering, siding or insulation. While not required, paint may be applied to these panels by conventional means, if it is desired.

Although only two inches thick, Kaylo Laminated Panels with cement-asbestos facing have better insulation value than 16 inches of solid concrete. Completely inorganic, they have unusual dimensional stability. They have remarkable resistance to deterioration from water or exposure to the elements and show virtually no expansion or contraction, even in extreme weather cycles.

QUICK INSTALLATION

Each standard 4' x 8' Kaylo panel provides a complete wall section, 32 square feet in area, which weighs only about 200 pounds. Each panel is easily erected complete in place in a few minutes. Compare this speed and simplicity of erection with the time and work required in the building of conventional masonry walls of various types. For example, an eight-inch brick wall of equal area requires mixing of mortar and laying individually 416 common bricks, resulting in a wall which weighs about 2700 pounds.

Panels may be joined to steel or wood framing by any of a wide variety of methods. Only standard tools used in the building trade are needed for erection work.

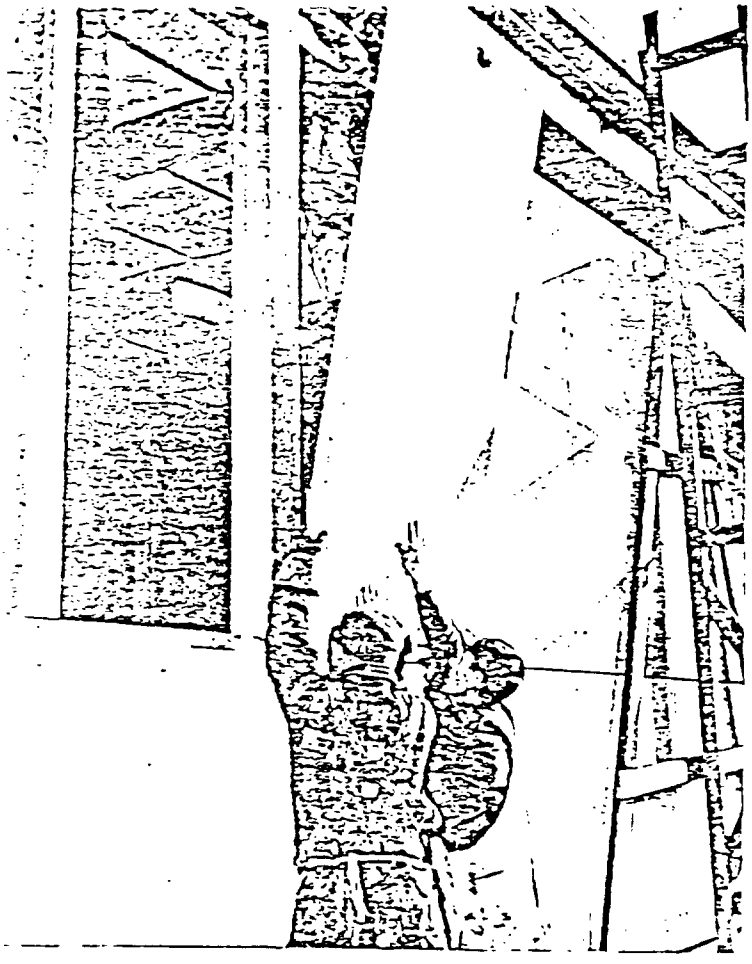
INCOMBUSTIBLE

Both the Kaylo core and cement-asbestos facing of these Kaylo Laminated Panels are incombustible. Installed with proper joint systems, the panels provide a wall that will withstand more than one hour's exposure to fire when tested by standard ASTM procedures.

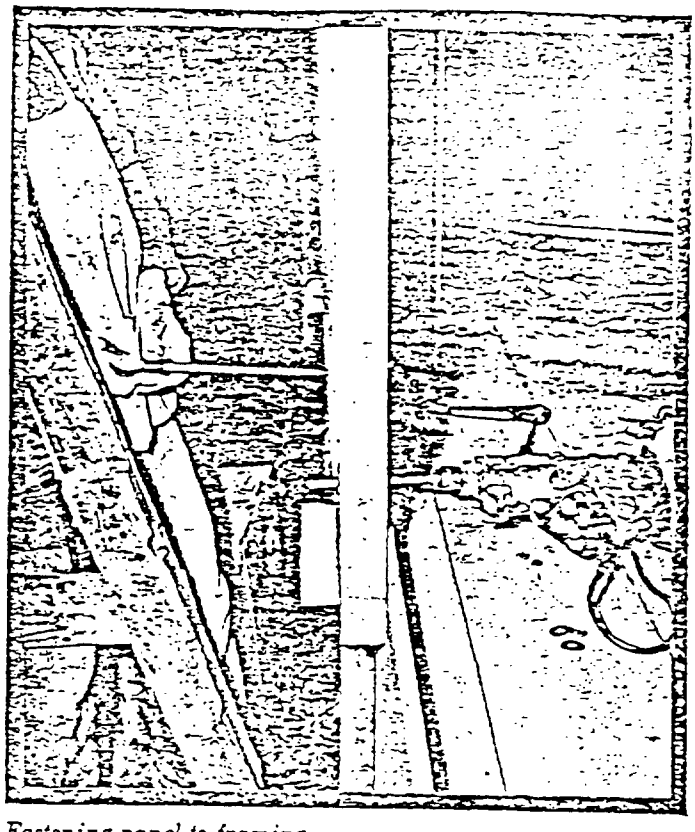
MANY APPLICATIONS

Possible applications for Kaylo Laminated Panels with cement-asbestos facing include interior partitions or exterior walls for nearly every type of building. A suggested list follows:

INDUSTRIAL:	COMMERCIAL:	PUBLIC:
Manufacturing buildings	*Stores*	*Schools*
Warehouses	*Warehouses*	*Hospitals*
Utility buildings	*Garages*	*Depots*
	Office buildings	
	Field stations	

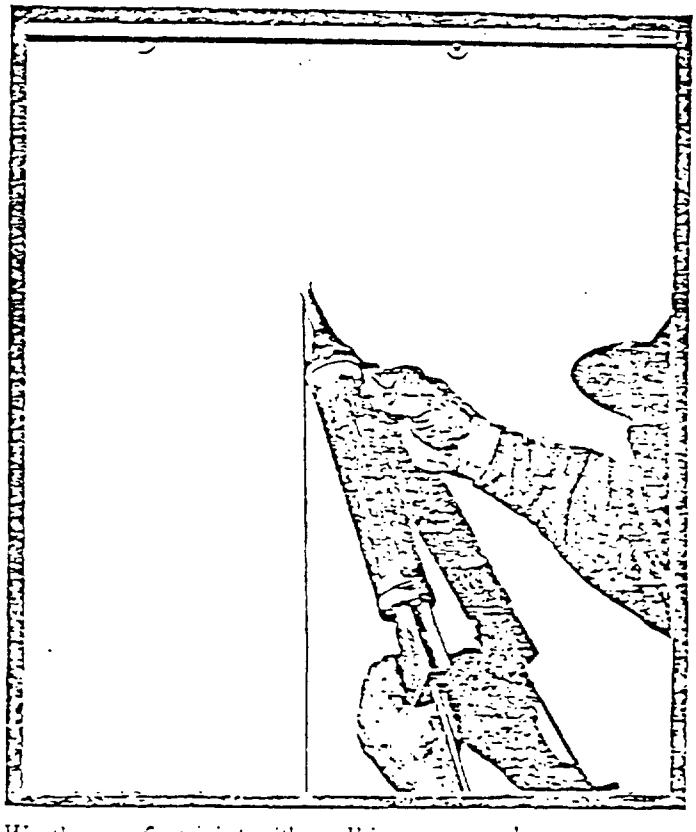


Workmen set panel into place.



Fastening panel to framing.

Spacer strip being nailed to edge of panel.



Weatherproofing joint with caulking compound.

THE KAYLO CORE

To appreciate the superiority of Kaylo Laminated Panels over other products of similar appearance, it is necessary to know something about the physical characteristics of the Kaylo core.

Near white in appearance, the Kaylo core is a stable, inorganic calcium-silicate material having a density of about 20 pounds per cubic foot. This light weight—lighter than all woods, except Northern White Cedar and Corkwood, contributes vitally to the utility and ease of handling, so characteristic of Kaylo Laminated Panels.

The large percentage of microscopic voids in its fine cellular structure gives the Kaylo core high resistance to the passage of heat, and, therefore, provides excellent insulation. Being inorganic it is rot and vermin proof. It is rated "Incombustible" by Underwriters' Laboratories and tests prove its superiority as a protection against the spread of fire-flame or smoke.

The physical characteristic possibly most important to a superior laminated panel is dimensional stability of the core. The dimensional stability of the Kaylo core is excellent. For a material so light in weight, it is exceptionally strong when subjected to flexural or compressive loads. Exposure to water produces only negligible change in dimensions and does not warp or swell the panel. Completely saturated, the Kaylo core retains at least 85% of its normal dry strength, which is completely recovered when material again becomes dry.

STANDARD PANELS

Kaylo Laminated Panels with cement-asbestos facing are nominally two inches thick. The Kaylo core is nominally 1¾" thick and each face veneer is ⅛" thick. Cement-asbestos faces are laminated to the core with a waterproof adhesive. Panel edges are protected by a weatherproof coating. The standard panel size is 4 feet x 8 feet. Other sizes are available on special order.

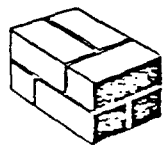
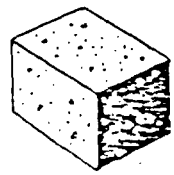
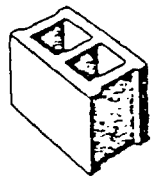
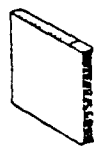
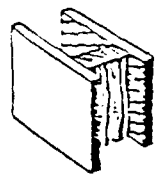
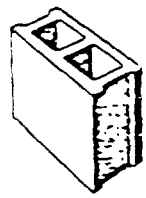
Complete technical data, including physical characteristics and typical construction details, are shown on the following pages.

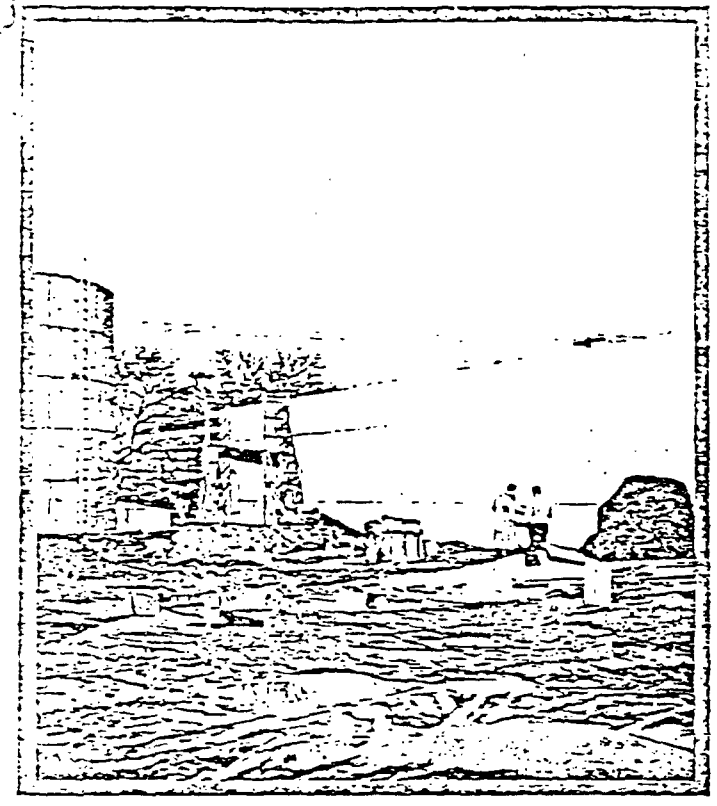
WEIGHT AND INSULATING VALUE

KAYLO®

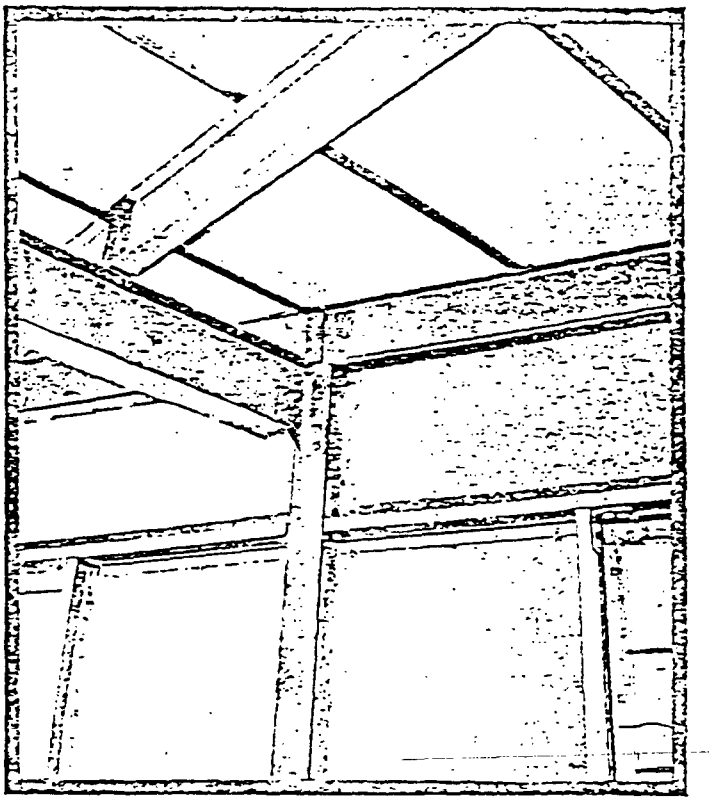
LAMINATED PANELS

COMPARED TO OTHER WALLS

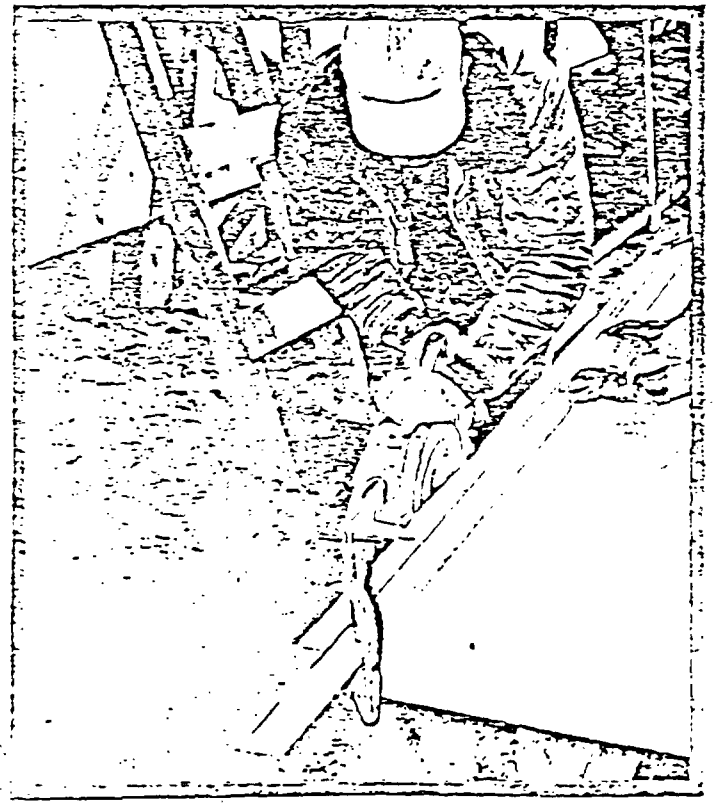
		U-FACTOR (Btu./sq. ft./hr./°F.)	WEIGHT (lb./sq. ft.)
2" KAYLO LAMINATED. PANELS WITH CEMENT-ASBESTOS FACING		.30	6¼
8" SOLID BRICK		.50	84
12" CONCRETE		.57	144
8" HOLLOW CINDER BLOCK		.42	30
2" CEMENT PLASTER ON CHANNEL STUDS AND METAL LATH		INSIDE PARTITION	17½
5" WALL ¾ PLASTER BOTH SIDES ON 2X4 STUDS AND METAL LATH		INSIDE PARTITION	18
4" HOLLOW TILE		INSIDE PARTITION	18



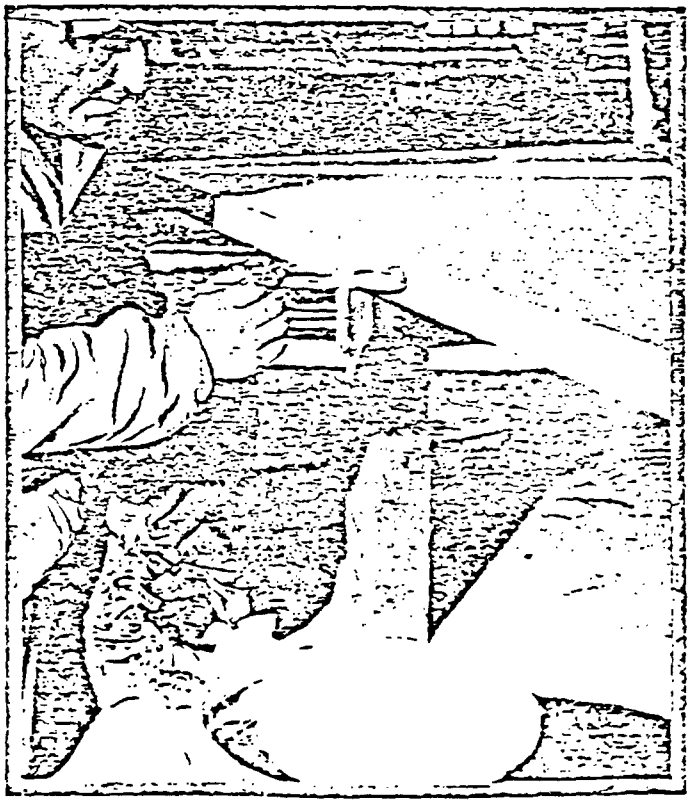
Kaylo Laminated Panels provide a neat outside wall, resistant to fire and weather.



Inside of wall provides clean, light-reflective surface. Kaylo Roof Deck makes attractive ceiling.

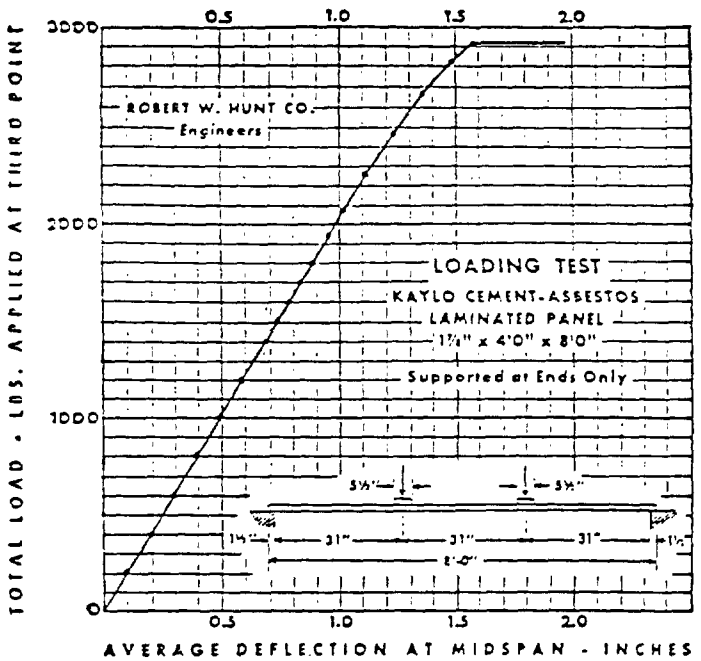


Panels may be cut on job to fit odd spaces with ordinary woodworking tools.



Cut edges may be weatherproofed on job by painting with waterproofing agents.

TECHNICAL DATA



STRENGTH

A 4' x 8' Kaylo Laminated Panel with cement-asbestos faces, supported on a 7'-9" span using one-third point loading, carried an ultimate load of 2920 pounds.

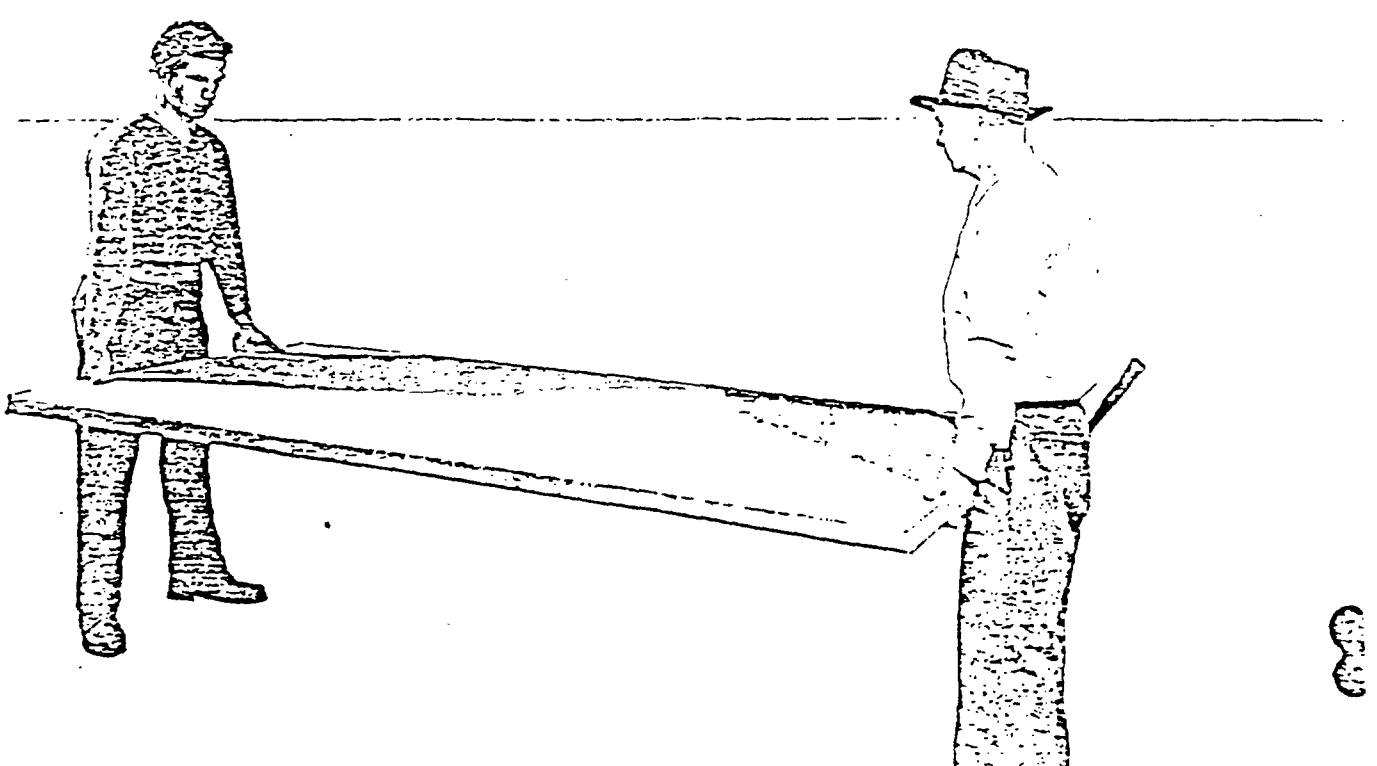
A panel restrained by three corners and the free fourth corner loaded three times with a weight of 113 lbs., produced a maximum deflection of about ½". When the weight was removed, the panel returned to its original position. From the load-deflection curve, at the left, it is obvious that the panel supported on a 7'-9" span can withstand many times the required design windloads without exceeding its elastic limit.

IMPACT RESISTANCE

In an impact load test conducted according to Bureau of Standards procedures a 60 lb. weight was dropped on the center of a panel supported on a 7'-6" span. The height of the drop was increased by 6" increments, beginning at 6". The panel did not break until the drop had reached 6'-0". The instantaneous deflection on the drop of 5'-6" was only 1.07".

FIRE RESISTANCE

In a fire test conducted in accordance with standard A.S.T.M. test procedure on a 2" Kaylo Laminated Panel with cement-asbestos faces, the average temperature rise on the cool side did not exceed 250° F. until more than 60 minutes time had elapsed.



KAYLO® LAMINATED PANELS WITH CEMENT-ASBESTOS FACING

INSULATION VALUE

The U-factor of a panel 1⅛" thick, for ambient still air, is 0.26. For outside exposure (one side exposed to 15 mph wind) it is 0.30.

SCREW-HOLDING POWER

No. 10 wood screws driven 1" into a Kaylo Laminated Panel with cement-asbestos faces, using a No. 17 drill for the pilot hole, had a withdrawal resistance averaging 190 lbs.

SOUND TRANSMISSION

The sound reduction of a panel tested at frequencies from 137 to 2070 averaged 35 decibels. The reduction between frequencies of 1161 to 2070 averaged 42 decibels.

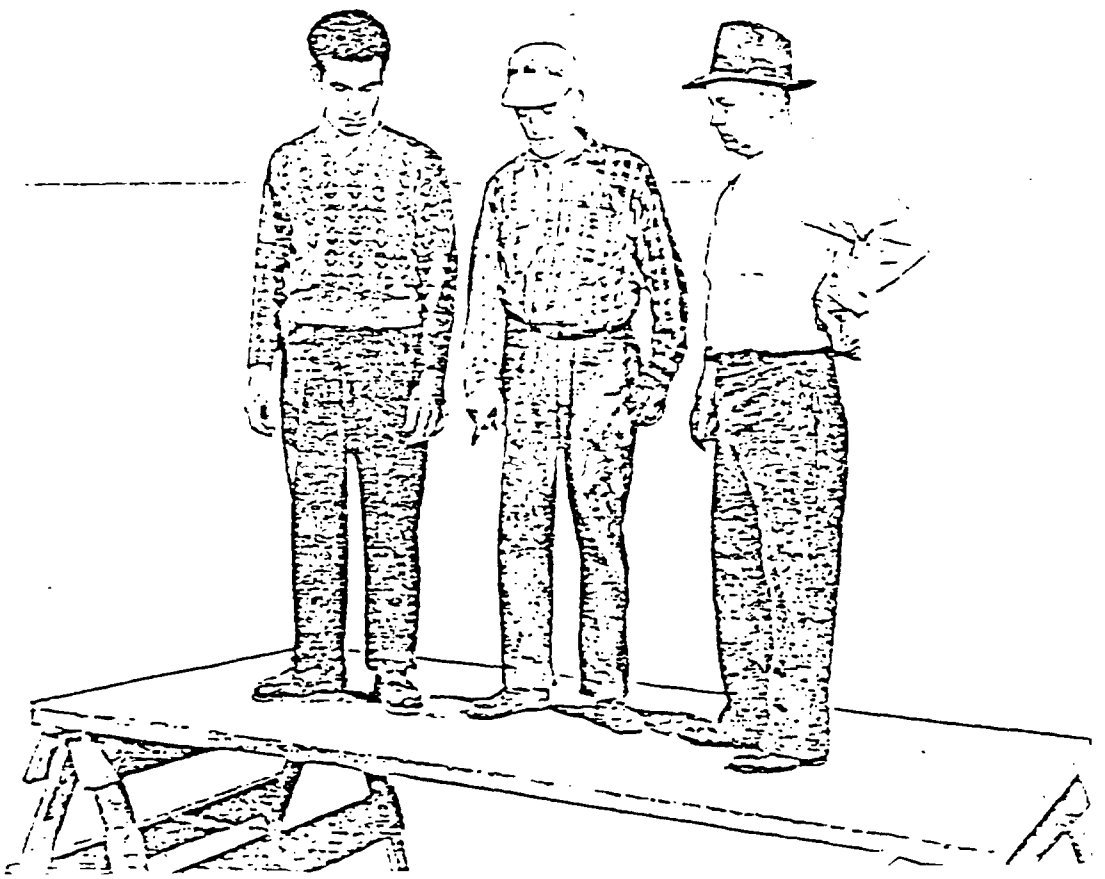
VAPOR TRANSMISSION

Building materials, to be considered good vapor barriers, are expected to have average vapor transmission rates of less than 1.25 grains per hr. per sq. ft. per in. of mercury pressure differential between the two faces. Kaylo panels average 1.22. With suitable paints on the cement-asbestos faces, vapor transmission is reduced considerably below this value. For example, an acceptable chlorinated rubber paint reduces vapor transmission of the Kaylo panel to practically nothing.

DELAMINATION

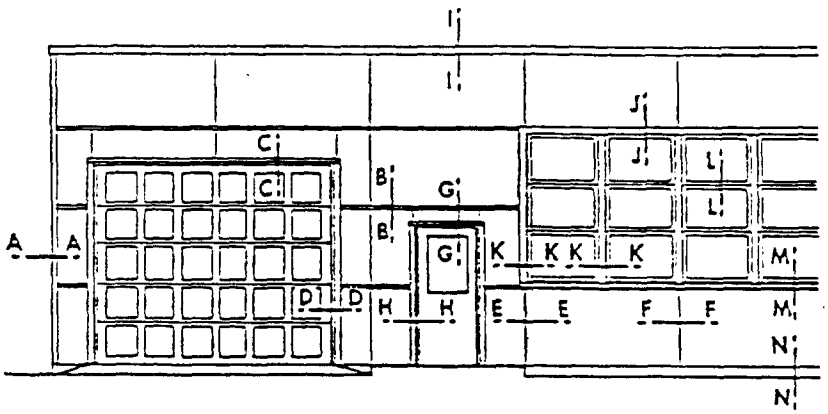
In order to produce delaminating effects, a panel was heated to 270° F. on one side only, then cooled. This was repeated for ten cycles while a temperature of 70° was maintained on the cool side. No distress and no apparent delamination resulted. In fact, this same panel was later used in the strength test mentioned previously.

Another panel heated to 175° F. on the hot side then cooled while a temperature of 70° F. was maintained on the cool side has gone through 120 cycles of heating and cooling without distress.

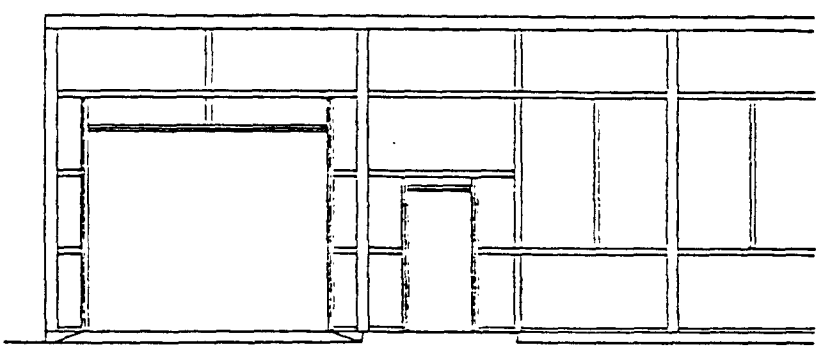


TYPICAL DETAILS

KAYLO®



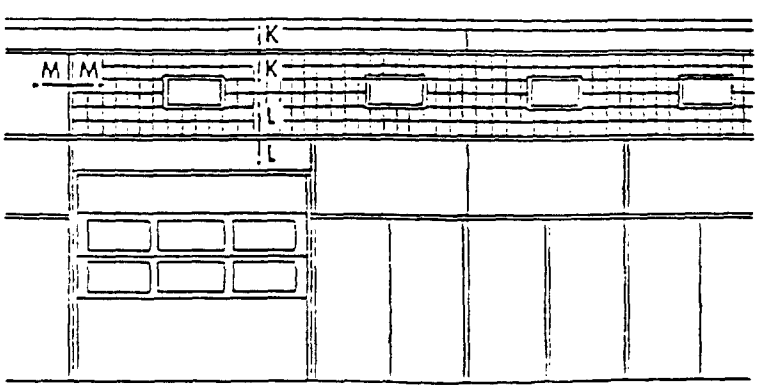
ELEVATION



ELEVATION · FRAMING

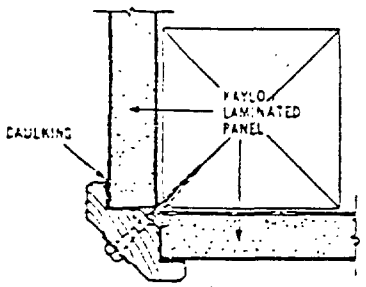
WOOD FRAMING

Scale 1½" = 1'-0"

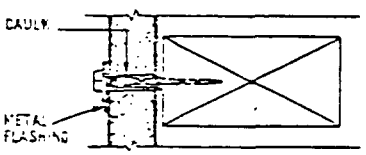


USING GLASS BLOCK WITH KAYLO LAMINATED PANELS

LAMINATED PANELS WITH CEMENT-ASBESTOS FACING



Detail "A-A"



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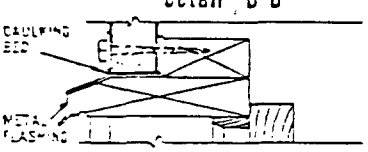
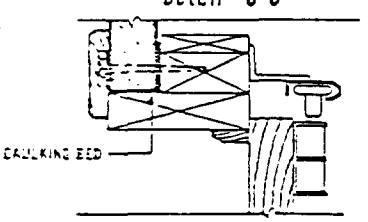
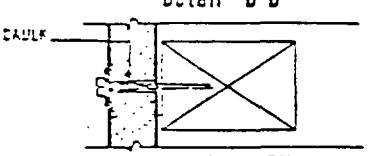


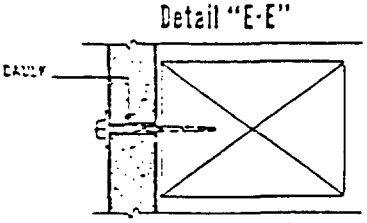
Detail "C-C"



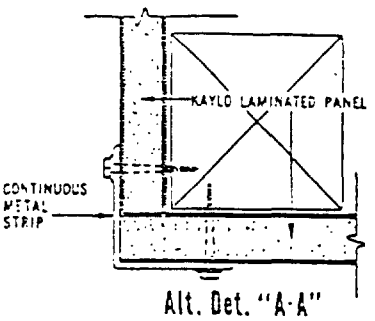
Detail "D-D"



Detail "E-E"



Detail "F-F"



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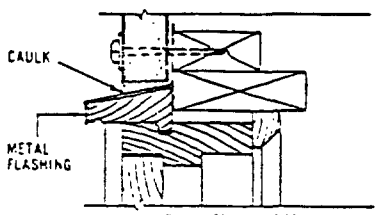

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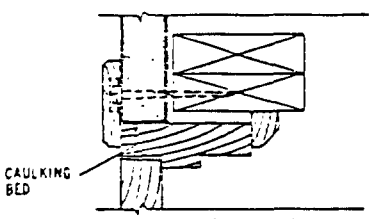

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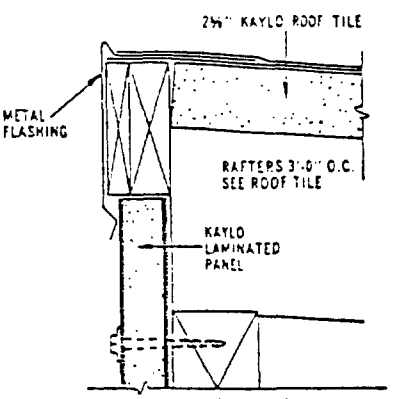

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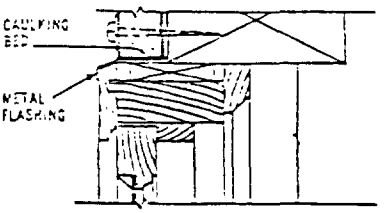

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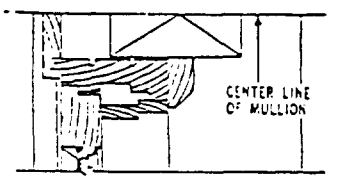

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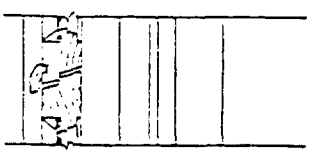
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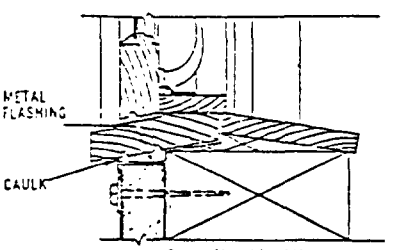

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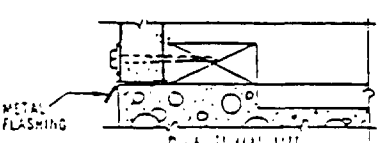

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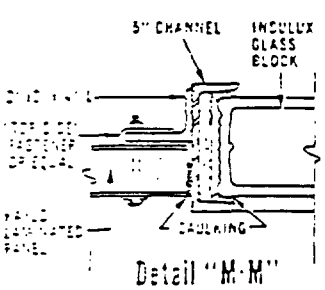

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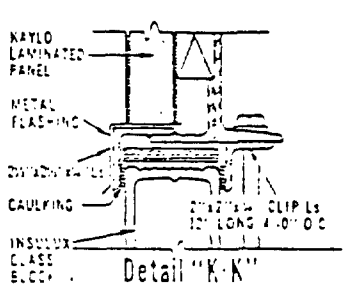

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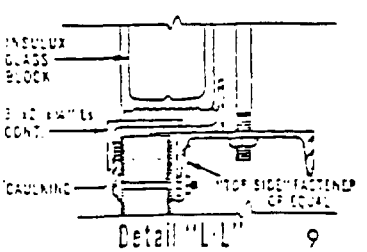
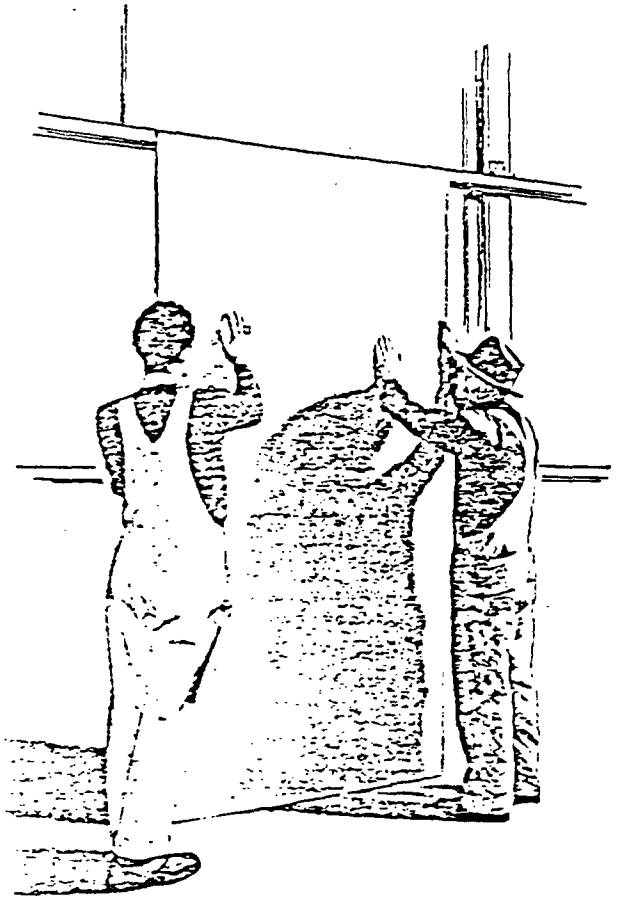


Detail "L-L"

TYPICAL DETAILS

KAYLO®



STEEL FRAMING

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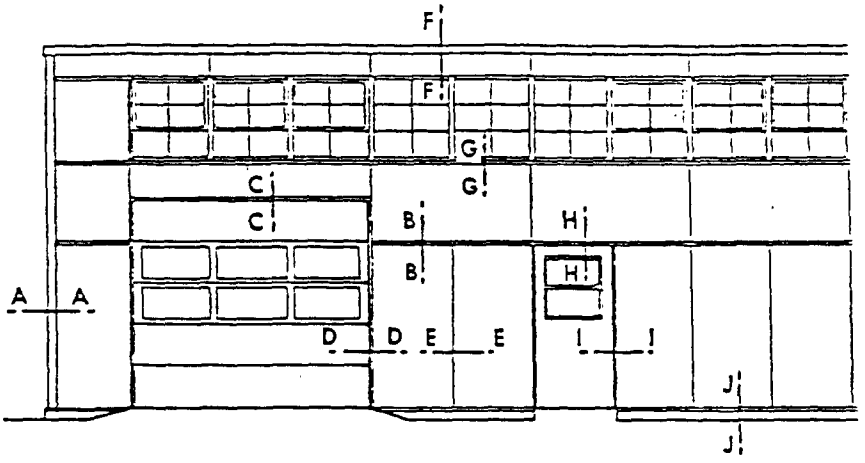
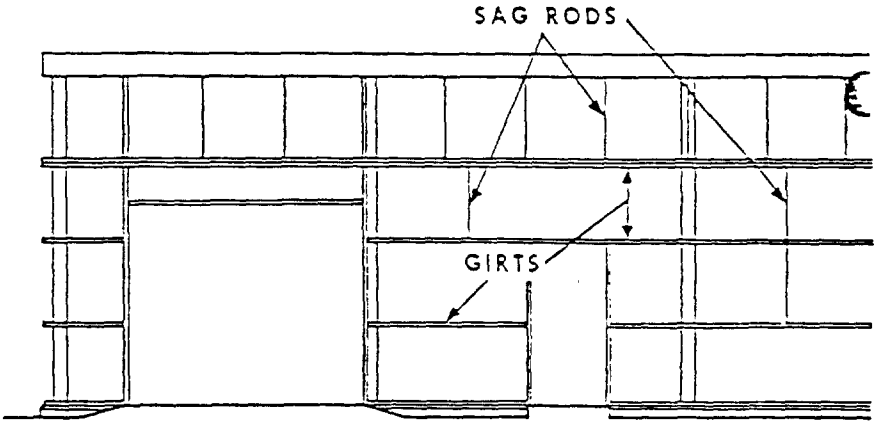
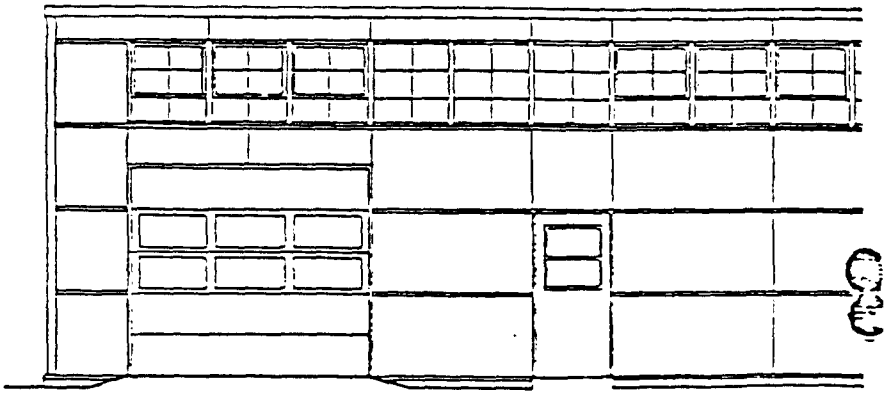


ELEVATION · VERTICAL PANELS



ELEVATION · FRAMING

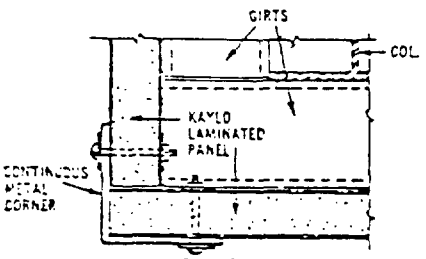


LAMINATED PANELS

WITH

CEMENT-ASBESTOS

FACING



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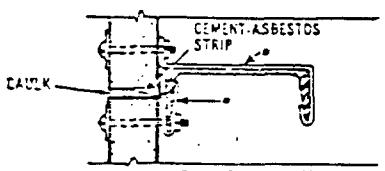
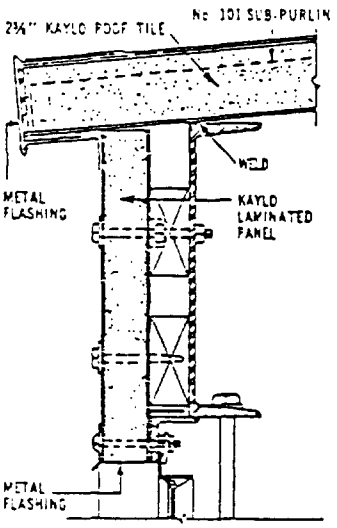


Detail "B-B"

Note Detail "B-B" | Special Flashing Required When Vertical Battens Are Listed



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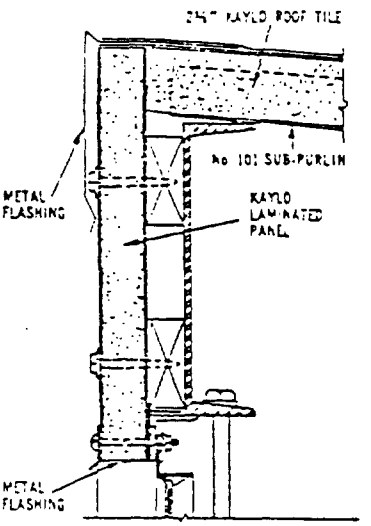

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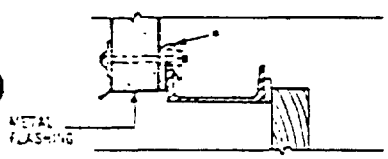
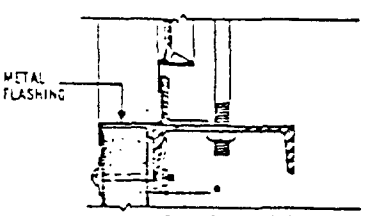


Detail "C-C"

*"Top Side" Fasteners by
H. & B. Enterprise Corp.
Trenton, New Jersey
or approved equal



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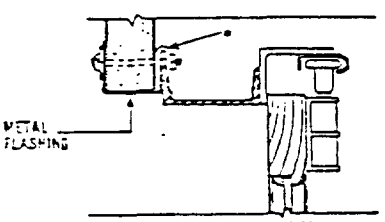

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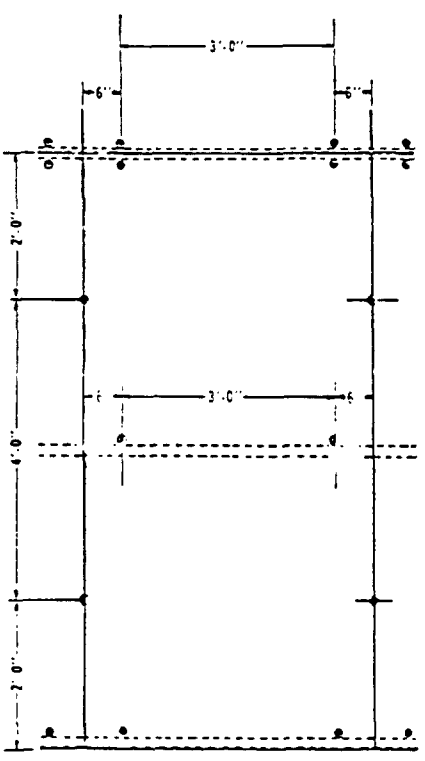

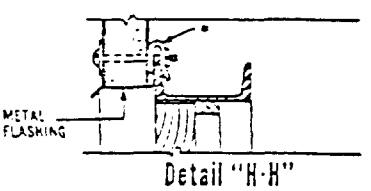

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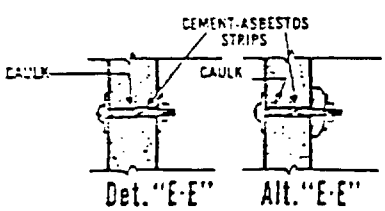

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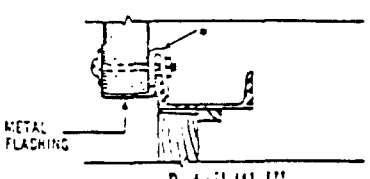

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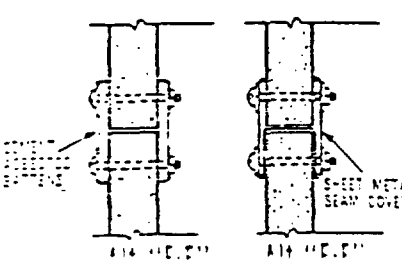

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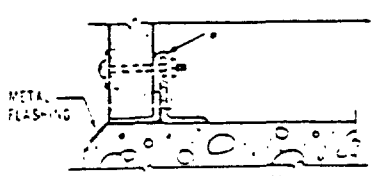

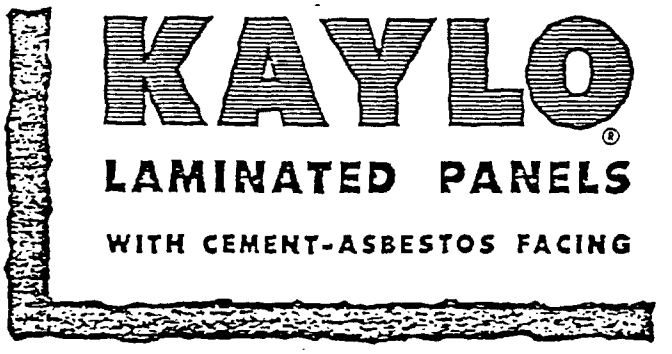

Kaylo Division

OWENS-ILLINOIS GLASS COMPANY

TOLEDO 1, OHIO

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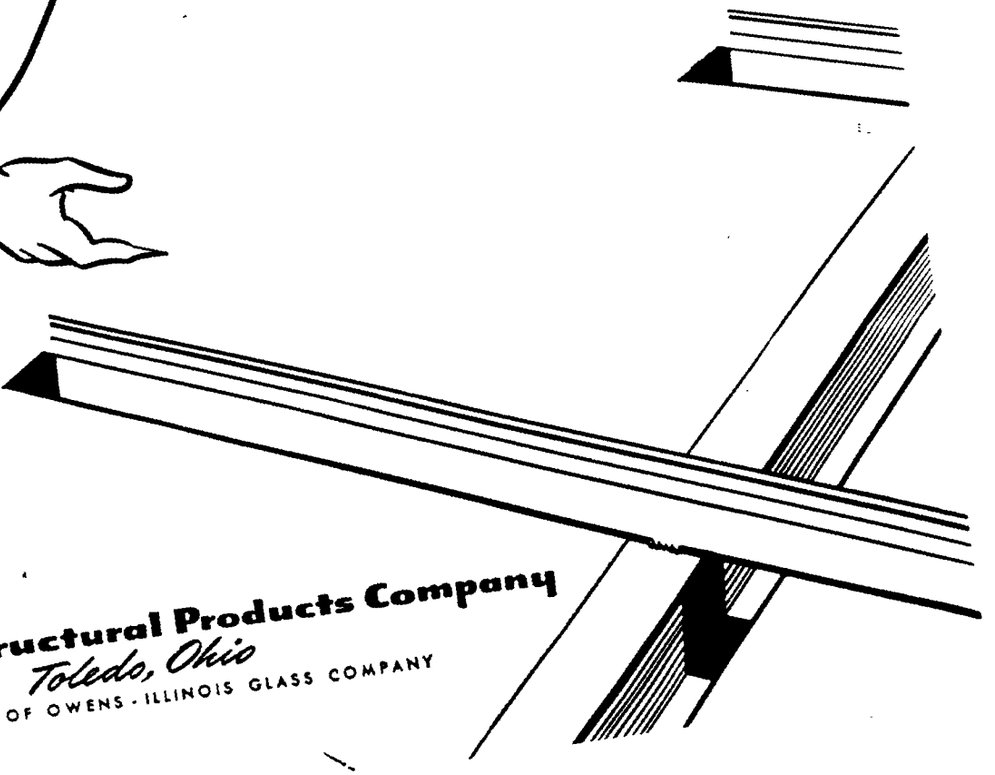
KAYLO®

Insulating ROOF TILE

For Lightweight, Non-Combustible Roof Decks



American Structural Products Company

Toledo, Ohio

SUBSIDIARY OF OWENS-ILLINOIS GLASS COMPANY

TABLE OF CONTENTS

Kaylo Roof Tiles have a rare combination of strength and light weight. Tiles are easy to handle, easy to carry. Moving loads of tiles across Kaylo Roof Decks in wheelbarrows or dollies is common practice.

KAYLO®
Insulating
ROOF TILE

SETS A NEW STANDARD FOR LIGHTWEIGHT NON-COMBUSTIBLE ROOF CONSTRUCTION

Kaylo Insulating Roof Tile laid on light steel members now makes available for the first time a roof deck in which fire protection, structural strength and insulation are all provided in a single lightweight all-mineral unit.

LIGHTWEIGHT

Kaylo Roof Tile decks weigh approximately six pounds per square foot, including supporting sub-purlins, or around five pounds to the square foot for the roof tile only.

Thus it is now possible to design a deck made with a non-combustible tile so that the dead load above the main purlins, including an excellent built-up roofing, is about twelve pounds per square foot of roof area.

STRUCTURAL UNIT

Kaylo Roof Tile is not merely a roof insulation. It is a reinforced structural unit designed for a total load of fifty pounds per square foot with an adequate safety factor. Its flexural strength is more than sufficient for typical roof deck requirements.

INSULATES AS IT COVERS

This lightweight roof deck combines structural strength and thermal insulation in one material. Since Kaylo Insulating Roof Tile provides insulation value equal to that of an inch and one-half of standard insulating board, no additional insulation is needed for usual installations. A special operation of applying insulation over the structural deck is thus eliminated.

FIREPROOF

Kaylo Roof Tile provides a new standard of fire protection for lightweight construction. The tile themselves will withstand building fire temperatures as defined by the standard A. S. T. M. fire curve, for more than one hour without failing in load-carrying capacity and without permitting a temperature rise on the cold side great enough to constitute failure. Fire originating above a Kaylo roof deck is prevented from producing dangerous temperatures within the building for a period of at least one hour.

Because of economy of steel in the supporting structure made possible by a Kaylo roof deck; because of its non-combustibility; because of its insulation value; because of its live-load-carrying capacity in relation to the dead load of the deck; and because it can be erected rapidly; this new roof construction recommends itself to every architect and engineer who has a major roof construction problem today.

FIELD TESTED

Kaylo Insulating Roof Tile has been introduced to the public after several years of experimental development and pilot plant manufacture by the Owens-Illinois Glass Company. In this development an area of several hundred thousand square feet has been incorporated in the construction of Owens-Illinois and American Structural Products buildings, and others, including plants, laboratories, offices and warehouses. Much of it has been in service for several years.

GENERAL DESCRIPTION

Kaylo Insulating Roof Tile is made in one size only, nominally 2¾ x 18 x 36 inches. It is white, or whitish in appearance and is made entirely of a non-combustible mineral base which is predominately a calcium silicate, or combination of calcium silicates, into which mineral fibers have been incorporated for reinforcing at the time of manufacture. This fiber-reinforced mass is additionally strengthened by a welded wire mesh placed in the tile at the time it is formed.

The unique cellular structure of Kaylo Insulating Roof Tile makes possible its remarkable combination of desirable characteristics. Kaylo Insulating Roof Tile has cells so small they are measured in fractions of a micron, and so tremendous in number that more than 80% of the tile is composed of air cells which together have a total wall area of more than one hundred acres per cubic foot of tile!

Tile units have a smooth under-surface with a light reflection factor of approximately 80 per cent.

SAVES ERECTION COSTS

Kaylo insulating roof decks are easier to install than conventional decks—yet they require no revolutionary new methods. Workmen like Kaylo Roof Tile.

When American Structural Products sub-purlins are used, a Kaylo Roof Tile deck is applied in only three steps—laying tile into place, grouting end joints and covering the deck with roofing materials. Kaylo Roof Tile can also be used with other types of framing.

No added application of roof insulation is necessary except where special conditions require an unusually high degree of insulation. In such cases light density Kaylo insulation in block form can be mopped in over the Kaylo insulating deck. A two-inch thickness, for example, mopped in over a standard Kaylo insulating deck will provide a U value, or over-all transmission, of approximately 0.10 Btu per hour per square foot per degree difference between inside and outside temperatures.

Kaylo Insulating Roof Tile can be fitted to odd-sized spaces at the job-site without special tools. Any saw which will cut the wires, such as a light power saw, is suitable. Kaylo Roof Tile can be readily chipped or gouged to fit irregular surfaces.

Because of its light weight and convenient size, Kaylo Roof Tile is easy to carry to the place where it is to be laid. It has been designed as a simple, one-man tile and weighs only approximately 23 pounds per tile (having an area of four and one-half square feet).

SPECIFICATIONS, DESIGN DATA AND I

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including steel sub-purlins, grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. Sub-purlins. Steel sub-purlins shall be American Structural Products hollow box sub-purlins No. 102.

Before leaving the shop, all steel work shall be thoroughly cleaned of all loose rust, mill scale and foreign matter and given one coat of approved metal protection applied thoroughly and evenly.

2. Kaylo Roof Tile. Roof tile shall be precast and reinforced Kaylo Roof Tile, 2⅝ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

3. Anchors. Anchors are not required with American Structural Products sub-purlin No. 102.

4. Grout. Grout for end joints of tile shall be composed of the following materials, measured by volume:

	PROPORTIONS	
	Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gallons

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

5. Curbs. Kaylo Insulating Roof Tile 2⅝ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. Sub-purlins. To receive Kaylo Roof Tile, American Structural Products hollow box sub-purlins No. 102 shall be accurately spaced 3'-1" on centers.

Sub-purlins shall be welded to each support with one fillet weld, ¾ inch long placed on alternate sides of sub-purlins. Where joints of sub-purlins do not occur over supports, their ends shall be welded together. Where ends of sub-purlins bear on masonry, they shall be securely anchored to the masonry as shown on the drawings or with one bolt and 2 x 2 x ¼-inch plate washer at each sub-purlin.

2. Kaylo Roof Tile. Kaylo Roof Tile shall be spaced evenly on sub-purlins to provide a minimum end bearing of ½ inch, with that side up which is marked "top." Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc. and grout in place.

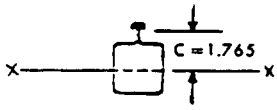
Where necessary to cut standard pieces for fitting, any hand or power saw which will cut the wire mesh is suitable.

3. Grout. Joints at ends of tile over sub-purlins, and at ridges and hips, shall be filled with grout mixed as specified. Where sub-purlin No. 102 is used the stem of the sub-purlin shall be completely surrounded with grout to provide a key anchorage against uplift pressure.

Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

4. Saddles. Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per one hundred square feet of roof.

DESIGN DATA FOR HOLLOW BOX SUB-PURLIN NO. 102



Size	Weight		Spacing	Ix-x In. 4	Iy-y In. 4	Sx-x In. 3
3 1/4" x 2 13/32" 14 ga. Metal	Lb. L.F. 3.00	Lb. S.F. of Roof 1.00	3'-1" On Centers	.955	.584	.541

ALLOWABLE SPANS FOR VARIOUS LOAD CONDITIONS

	Total Load (Per Sq. Ft.)	Span*		Deflection	
		f = 20,000	f = 18,000	f = 20,000	f = 18,000
Southern States & Pacific Slope	32 lb.	9'-8"	9'-3"	.360	.302
Central States	42 lb.	8'-5"	8'-0"	.271	.222
Rocky Mountain & N.E. States	49 lb.	7'-10"	7'-5"	.227	.191
Northwest States	57 lb.	7' 3"	6'-10"	.203	.160

Assumed dead load, per sq. ft. of roof:

Kaylo tile and sub-purlins.....6.0 lb.

Built-up roofing (tar and gravel)..... 6.0 lb.

Total dead load.....12.0 lb.

Assumed snow load, on horizontal surface per sq. ft of roof:

Southern States (live load).....20 lb. per sq. ft.
Central States.....30 lb. per sq. ft.
Rocky Mountains and N. E. States.....37 lb. per sq ft
Northwest States....45 lb. per sq. ft.

$M = \frac{WI}{10}$

* Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bending occurs, reduce span.

TAILS . . . . . KAYLO ROOF TILE

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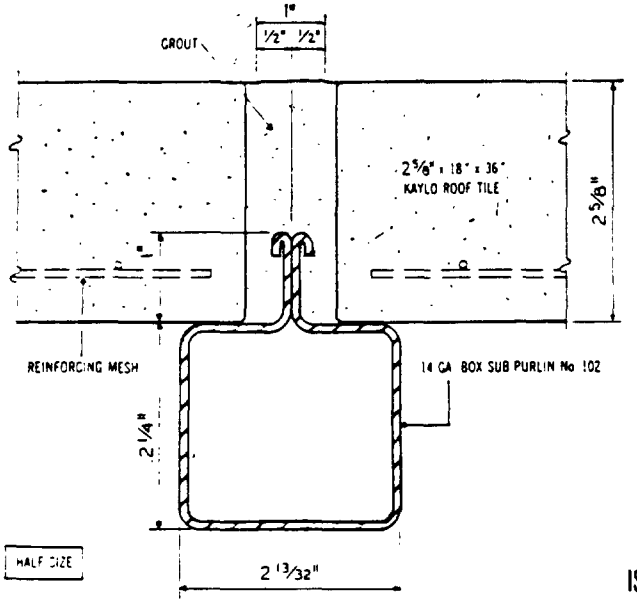
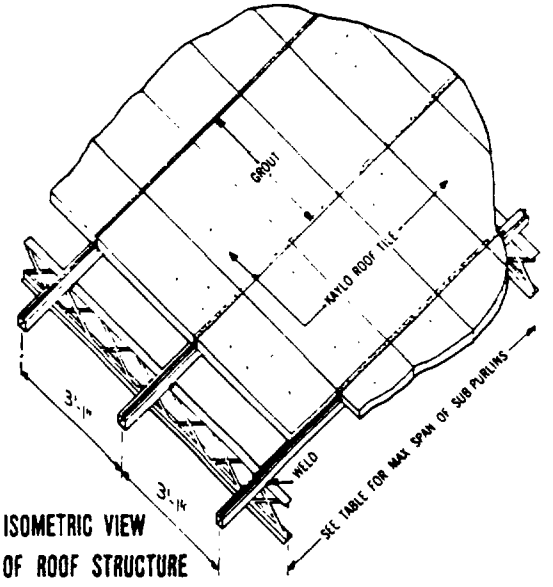
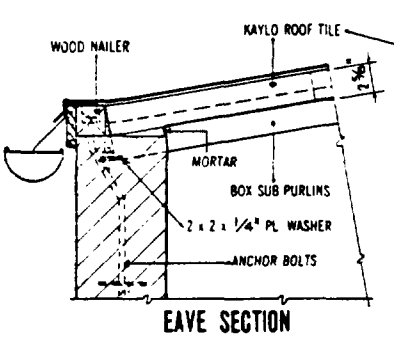


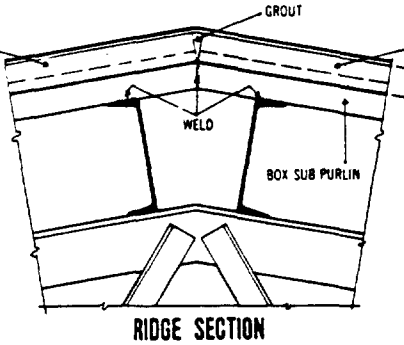
SECTION THROUGH JOINT



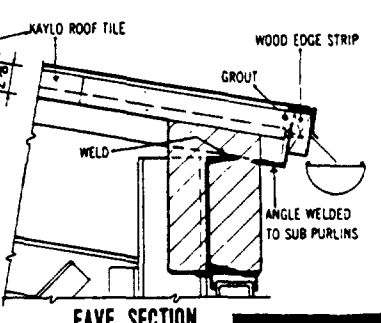
ISOMETRIC VIEW
OF ROOF STRUCTURE



EAVE SECTION
WALL BEARING



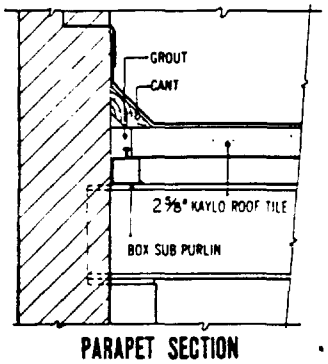
RIDGE SECTION



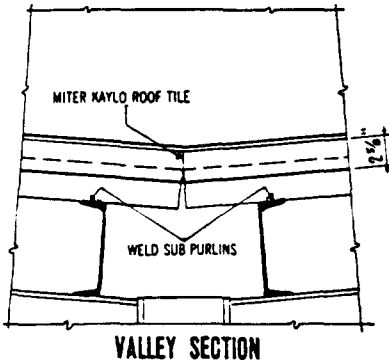
EAVE SECTION
SKELETON FRAME

HOLLOW BOX SUB-PURLINS

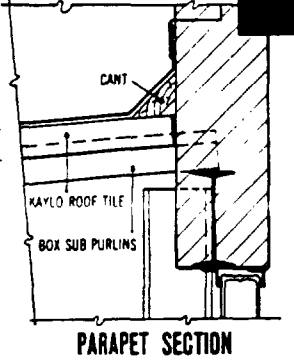
Scale ¾" = 1'-0"
Except as noted



PARAPET SECTION
SUB PURLIN PARALLEL TO WALL



VALLEY SECTION



PARAPET SECTION
SUB-PURLIN PERPENDICULAR TO WALL

SPECIFICATIONS, DESIGN DATA AND D

Rail Sub-Purlin No. _ _ _

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including steel sub-purlins, grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. Sub-purlins. Steel sub-purlins shall be American Structural Products structural steel rail sections No. 101.

Before leaving the shop, all steel work shall be thoroughly cleaned of all loose rust, mill scale and foreign matter and given one coat of approved metal protection applied thoroughly and evenly.

2. Kaylo Roof Tile. Roof tile shall be precast and reinforced Kaylo Roof Tile, 2⅝ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

3. Anchors. Anchors are not required with American Structural Products sub-purlins No. 101.

4. Grout. Grout for end joints of tile shall be composed of the following materials, measured by volume:

	PROPORTIONS Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gallons

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

5. Curbs. Kaylo Insulating Roof Tile 2⅝ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. Sub-purlins. To receive Kaylo Roof Tile, American Structural Products rail sub-purlins No. 101 shall be accurately spaced 3'-1¼" on centers.

Sub-purlins shall be welded to each support with one fillet weld, ¾ inch long placed on alternate sides of sub-purlins. Where joints of sub-purlins do not occur over supports, their ends shall be welded together. Where ends of sub-purlins bear on masonry, they shall be securely anchored to the masonry as shown on the drawings or with one bolt at each sub-purlin.

2. Kaylo Roof Tile. Kaylo Roof Tile shall be spaced evenly on sub-purlins to provide a minimum end bearing of ½ inch, with that side up which is marked "top." Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc. and grout in place.

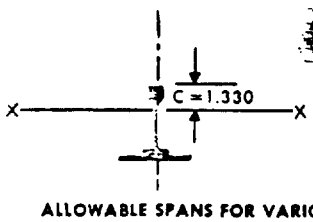
Where necessary to cut standard pieces for fitting, any hand or power saw which will cut the wire mesh is suitable.

3. Grout. Joints at ends of tile over sub-purlins, and at ridges and hips, shall be filled with grout mixed as specified. Where sub-purlin No. 101 is used the stem of the sub-purlin shall be completely surrounded with grout to provide a key anchorage against uplift pressure.

Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

4. Saddles. Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per one hundred square feet of roof.

DESIGN DATA FOR RAIL SUB-PURLIN NO. 101



Size	Weight Lb./L.F.	Weight Lb./S.F. of Roof	Spacing	Ix-x In. 4	Iy-y In. 4	Sx-x In. 3
2-1/4" x 2-3/8"	3.3	1.1	3'-1-1/4" On Centers	.694	.182	.522

ALLOWABLE SPANS FOR VARIOUS LOAD CONDITIONS

	Total Load (Per Sq. Ft.)	Span* f = 20,000	Span* f = 18,000	Deflection f = 20,000	Deflection f = 18,000
Southern States & Pacific Slope	32 lb.	9'-6"	9'-0"	.454	.370
Central States	42 lb	8'-4"	7'-10"	.358	.279
Rocky Mountain & N.E. States	49 lb.	7'-9"	7'-4"	.310	.248
Northwest States	57 lb.	7'-2"	6'-9"	.258	.208

Assumed dead load, per square foot of roof:

Kaylo tile and sub-purlins	6.0 lb.
Built-up roofing (tar and gravel)	6.0 lb.
Total dead load	12.0 lb.

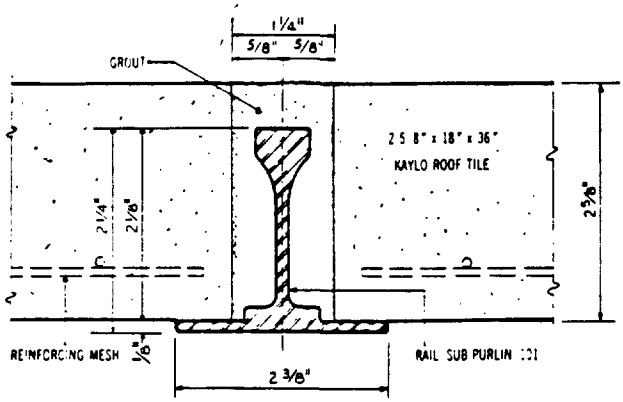
Assumed snow load on horizontal surface per square foot of roof.

- Southern States and Pacific Slope (live load)..20 lb. per sq. ft.
- Central States.....30 lb. per sq. ft.
- Rocky Mountains and N.E. States.....37 lb. per sq. ft.
- Northwest States....45 lb. per sq. ft.

$M = \frac{WI}{10}$

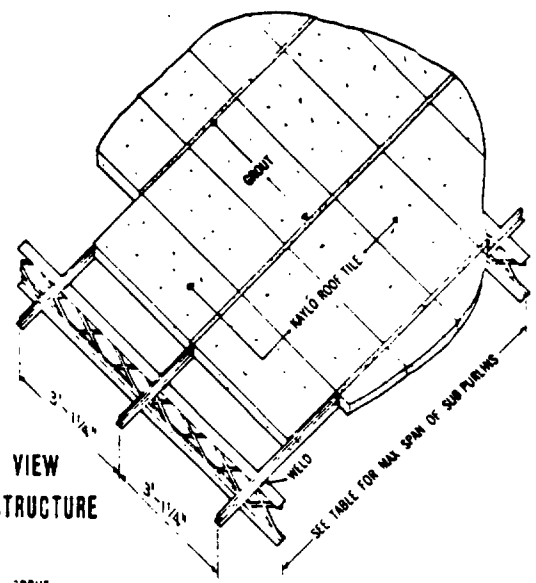
*Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bending occurs, reduce span.

TAILS . . . . . KAYLO ROOF TILE

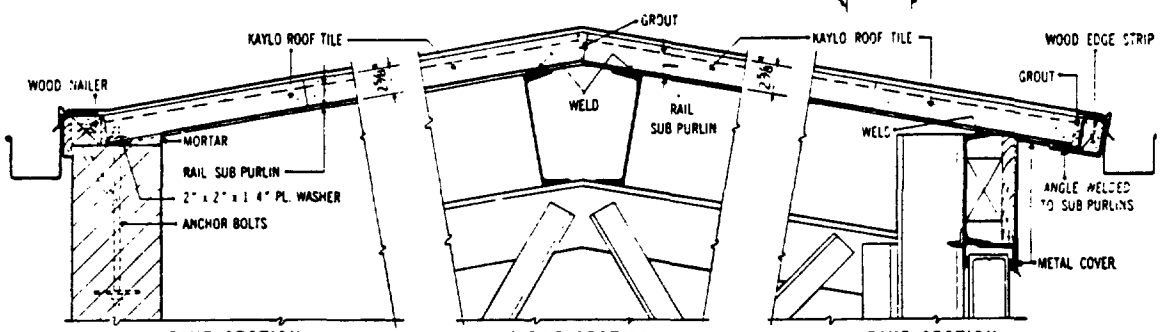


SECTION THROUGH JOINT

HALF SIZE



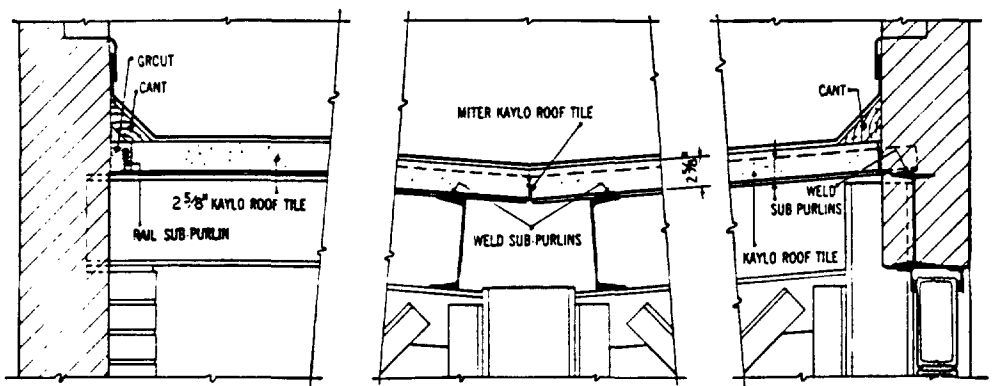
ISOMETRIC VIEW
OF ROOF STRUCTURE



EAVE SECTION
WALL BEARING

RIDGE SECTION

EAVE SECTION
SKELETON FRAME



PARAPET SECTION
SUB-PURLIN PARALLEL TO WALL

VALLEY SECTION

PARAPET SECTION
SUB-PURLIN PERPENDICULAR TO WALL

RAIL SUB-PURLINS

Scale ¾" = 1'-0"
Except as noted

SPECIFICATIONS, DESIGN DATA AND D

Standard Structural Members

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including (bent studs) (staple clips) (nails), grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. Kaylo Roof Tile.

Roof tile shall be precast and reinforced Kaylo Roof Tile, 2⅝ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

2. Anchorage Materials.

(Select one which applies to details used.)

ab. Bent Studs (for trussed purlins or standard structural shapes)

Bent studs shall be 1½" x 1½" N. T. Bent O. L. E. Studs. (Not threaded; outside loaded end.) Each stud shall have a suitable ferrule. Studs and ferrules shall be as manufactured by Nelson Stud Welding Corp., or approved equal.

c. Nails (for wood framing)

Nails for fastening Kaylo Roof Tile to wood framing members shall be 20d common x 4" long.

d. Nails (for Stran-Steel)

Nails for fastening Kaylo Roof Tile to Stran-Steel shall be 12d common x 3" long.

dd. Staples (for Stran-Steel)

Staples shall be #12 ga. (.105) mill galv. steel wire at least 3" long and 1" wide.

3. Grout.

Grout for end joints of tile shall be composed of the following materials, measured by volume:

	PROPORTIONS	
	Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gal.

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

NOTE: Reduce water content when using Stran-Steel. (Minimum quantity, 4 gallons per batch.)

4. Curbs.

Kaylo Insulating Roof Tile 2⅝ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. Purlins (or joists).

Purlins or joists shall be furnished and installed by others. They shall be accurately spaced 3'-0½" on centers to receive Kaylo Roof Tile.

2. Kaylo Roof Tile.

Kaylo Roof Tile shall be spaced on sub-purlins or joists to provide an end bearing of at least ½ inch, with that side up which is marked "top." Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc., and grout in place.

Where necessary to cut standard pieces, any hand or power saw which will cut the wire mesh is suitable.

3. Anchorage.

(Select one which applies to details used.)

ab. Bent Studs (for trussed purlins or standard structural shapes)

Bent Studs shall be securely welded to the top chord of purlins by the Nelson Gun Stud Welder or other approved method. They shall be spaced 9" o. c. and lined up accurately on each purlin.

c. Nails (for wood framing)

Nails shall be spaced 9" o. c. Two nails at each end of tile shall be driven vertically through roof tile and sunk so that heads are flush with top of tile.

d. Nails (for Stran-Steel)

Nails shall be spaced 3" o. c. and driven into Stran-Steel a minimum of 1¼". The heads of the nails shall project above the Stran-Steel a minimum of 1½".

dd. Staples (for Stran-Steel)

Staples shall be spaced 3" on centers and driven into Stran-Steel a minimum of 1¼". Staples shall project above Stran-Steel a minimum of 1½".

4. Grout.

Joints at ends of tile over purlins or joists, and at ridges and hips, shall be filled with grout mixed as specified. The grout shall completely fill the joint over the purlins so that the (bent studs) (nails) (staples) are entirely encased in grout to provide anchorage against uplift pressure.

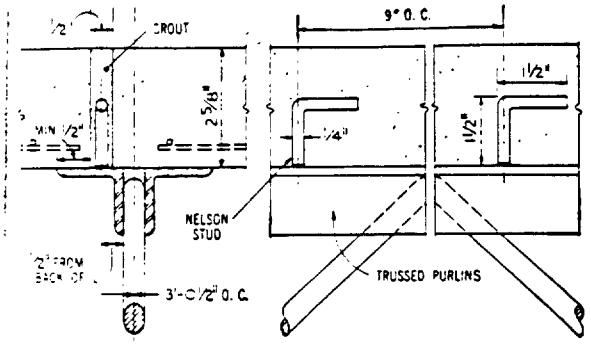
Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

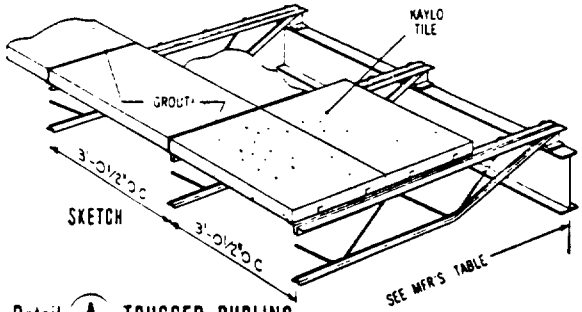
5. Saddles.

Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per hundred square feet of roof.

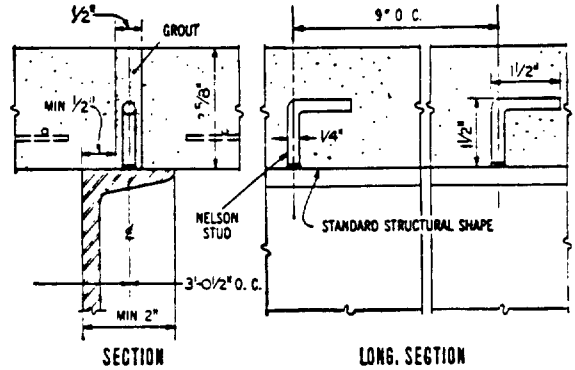
TAILS ..... KAYLO ROOF TILE

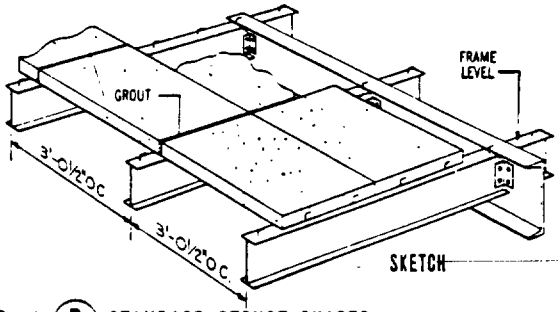
3c
1



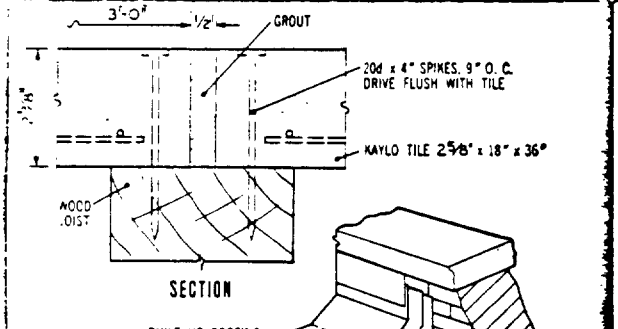


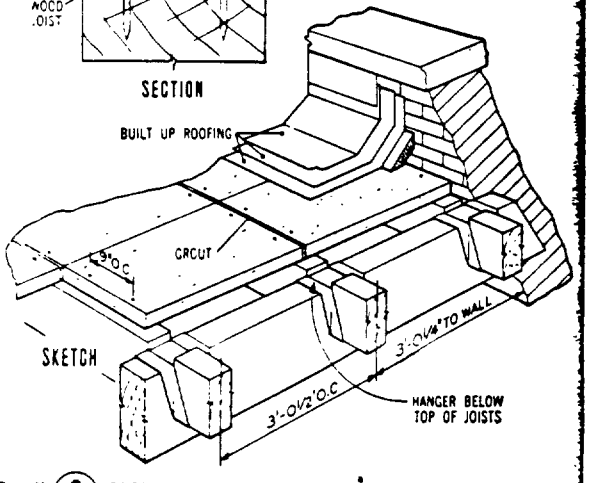
Detail (A) TRUSSED PURLINS



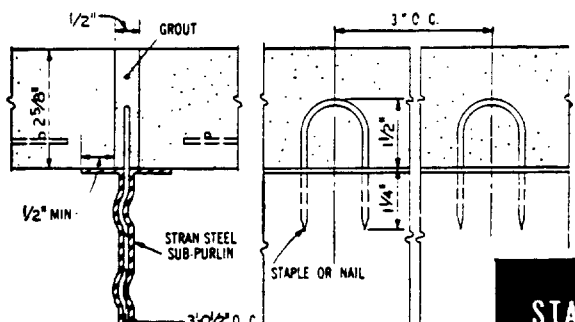


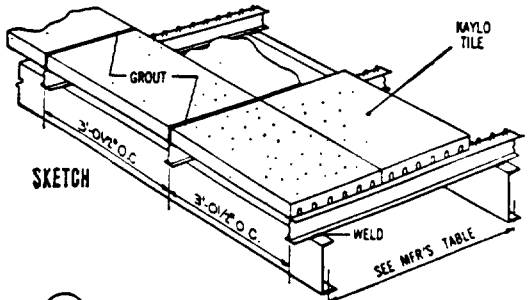
Detail (B) STANDARD STRUCT. SHAPES





Detail (C) SLOW BURNING CONST.

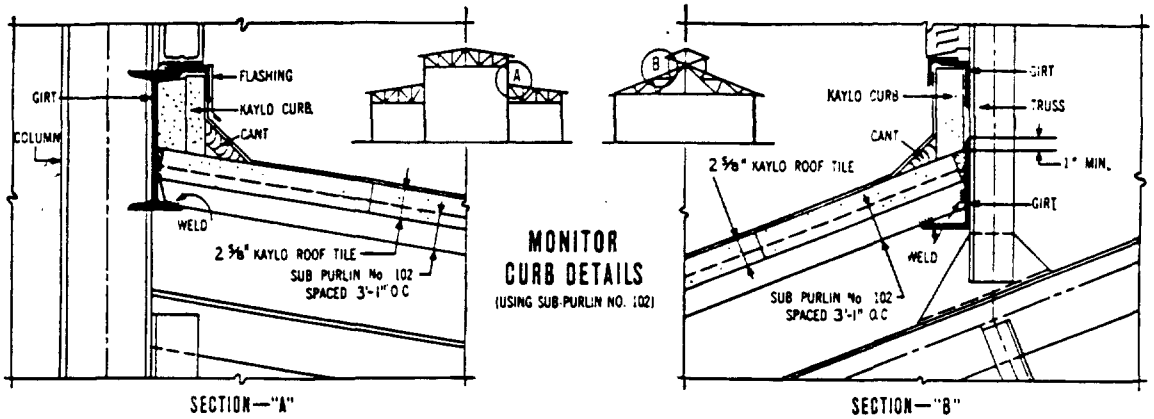




Detail (D) STRAN-STEEL SUB-PURLINS

STANDARD PURLINS

Scale 3" = 1'-0"
Except as noted

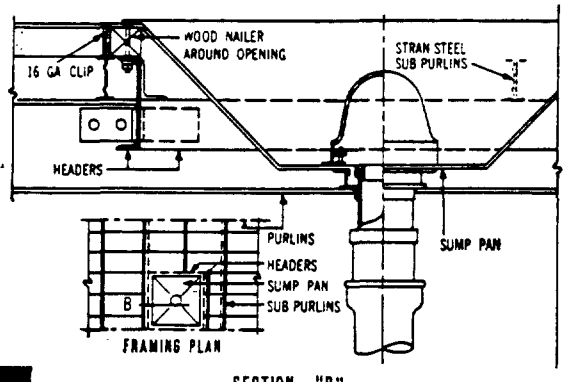


SECTION—"A"

MONITOR CURB DETAILS

(USING SUB-PURLIN NO. 102)

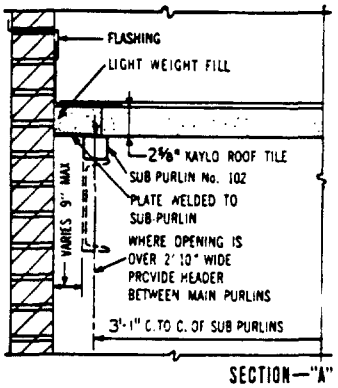
SECTION—"B"



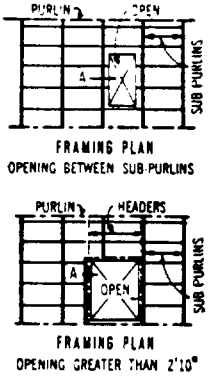
SECTION—"B"

FRAMING FOR SUMP PAN

(USING STRAN-STEEL SUB PURLINS)



SECTION—"A"

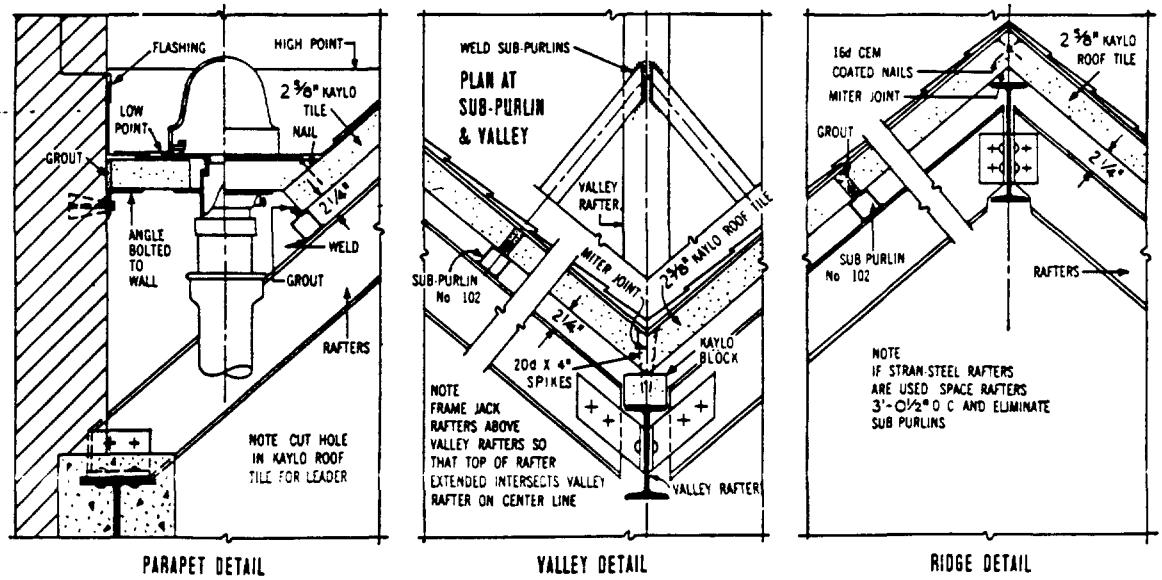


FRAMING AROUND OPENINGS

(USING SUB-PURLIN No. 102)

TYPICAL DETAILS

Scale ¾" = 1'-0"
Except as noted



PARAPET DETAIL
(SHOWING ROOF DRAIN)

VALLEY DETAIL

RIDGE DETAIL

DETAILS FOR STEEP PITCHED ROOFS—RAFTER FRAMING

TECHNICAL DATA **KAYLO ROOF TILE**

INSULATING VALUE

Thermal conductivity "K" (Btu. sq. ft., hr., °F., in.).....0.62

Overall heat transf. coef. "U" (Btu., sq. ft./hr., °F., thickness)

Roof tile only.....0.20

Roof tile — built-up roofing.....0.19

Roof tile — 1½" insulation* — built-up roofing.....0.11

Roof tile — 2" insulation — built-up roofing.....0.10

*11-lb. density Kaylo Insulation

STRENGTH

FLEXURAL STRENGTH This table shows the factor of safety and deflection of Kaylo Insulating Roof Tile for several uniformly distributed loads.

CLEAR SPAN=34 INCHES - DEFLECTION FOR 1/360 OF SPAN=.0945 INCHES

TOTAL UNIFORM LOAD (LB./SQ FT.)	FACTOR OF SAFETY ULTIMATE	DEFLECTION (INCHES)
40	11.1	.023
45	9.9	.026
50	8.9	.029
55	8.0	.032
60	7.4	.035

MODULUS OF RUPTURE. The average modulus of rupture for Kaylo Roof Tile is 175 lb. per sq. in.

MODULUS OF ELASTICITY. The average modulus of elasticity for Kaylo Roof Tile is 160,000 lb. per sq. in.

COMPRESSIVE STRENGTH. The average compressive strength for Kaylo Roof Tile is 500 lb. per sq. in.

FIRE RESISTANCE

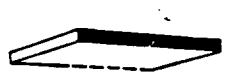
Kaylo Roof Tile is non-combustible. It will resist a typical building fire, as defined in the standard A. S. T. M. time-temperature curve, for more than one hour. Thus, a fire originating on the top side can burn off the applied covering and the fire resistance of the tile will enable the tile to carry its required load for more than one hour and at the same time protect the interior from excessive temperature rise. For a fire originating within the building the limit of endurance is the limit of the supporting steel or the limit of the construction immediately below the roof deck.

WEIGHT

Approximate weight per square foot (lb.).....5.0

Approximate density (lb. per cu. ft.).....20.5

Approximate weight per tile (lb.).....23.0



DIMENSIONAL STABILITY

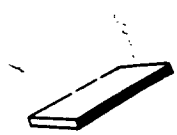
DIMENSIONAL CHANGE DUE TO MOISTURE. The linear expansion of Kaylo Roof Tile after repeated cycles of soaking and drying is approximately .04 of 1%. This equals an increase in length for a standard tile of only fourteen-thousandths of an inch.

STRENGTH WHEN WET. The flexural strength of Kaylo Roof Tile when soaking wet (after soaking for 10 hours) is approximately 85% of its normal strength.

NAIL-HOLDING POWER

RESISTANCE TO DIRECT NAIL WITHDRAWAL (SMOOTH NAILS)

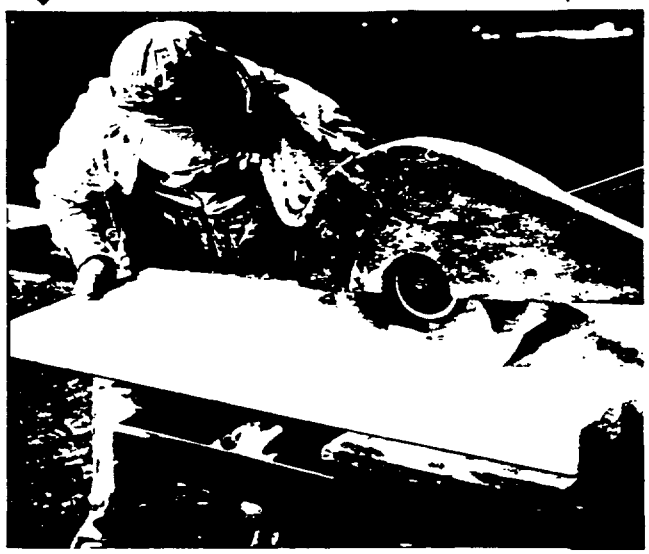
Size of Nail	6d	7d	8d	9d	10d	12d	16d	20d	30d	40d
Diameter in inches	.113	.113	.131	.131	.148	.148	.162	.192	.207	.225
Resistance of Kaylo Roof Tile (Total Pull in Lbs. per Inch Penetration).	20	20	23	23	26	26	28	32	36	40

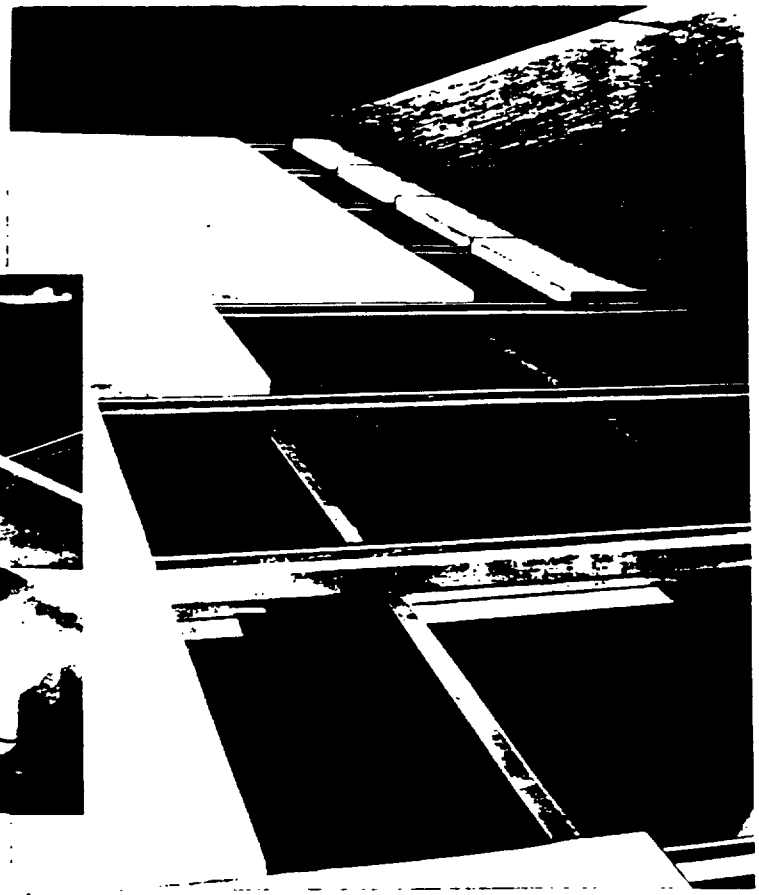


LIGHT REFLECTIVITY

Light reflectivity of Kaylo Roof Tile is approximately 80%.

Cutting of Kaylo Roof Tile to fit odd spaces is easily accomplished with a power saw or a hand saw. Tile can be cut or gouged with a knife to fit over rivet heads or other irregular surfaces.



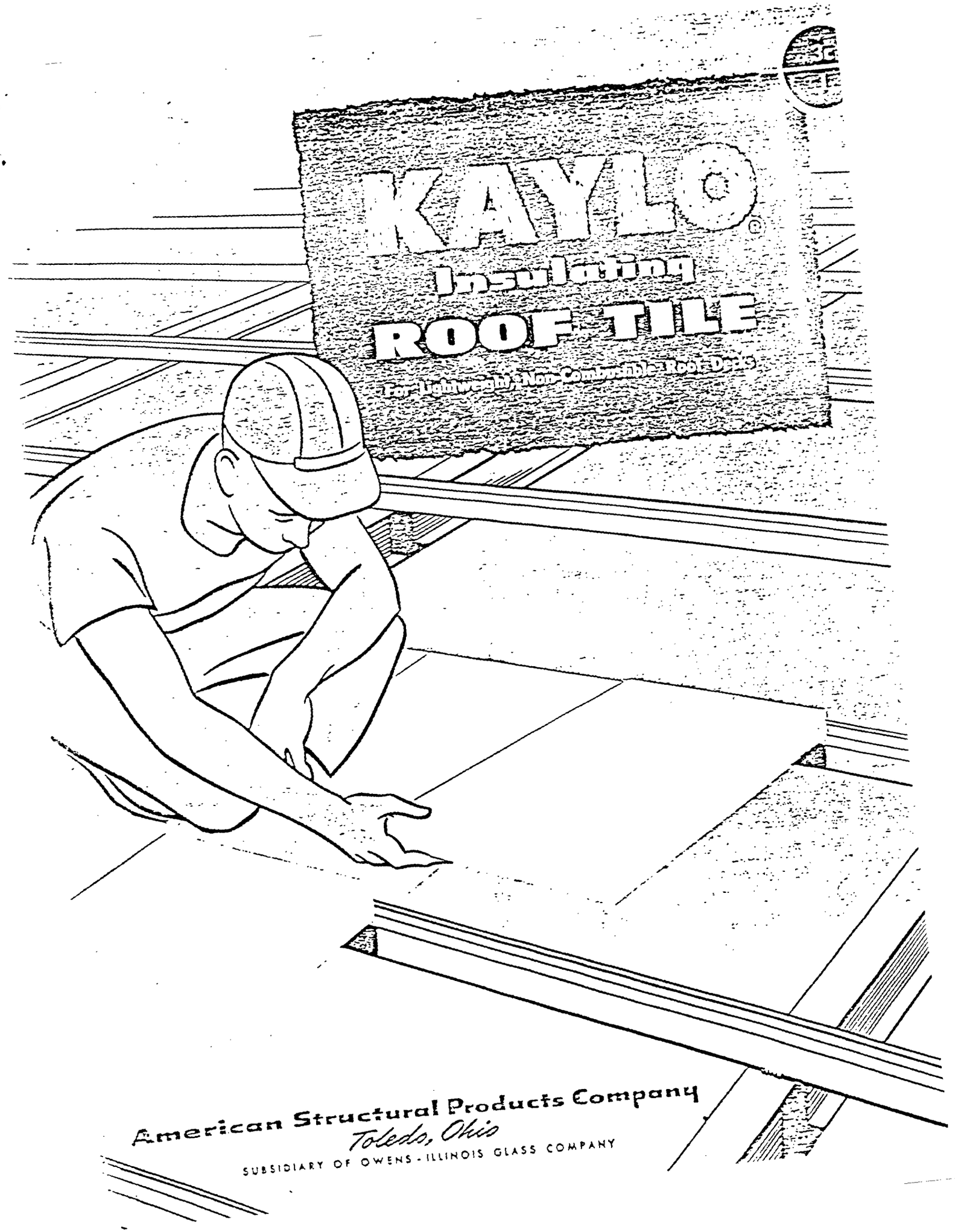


KAYLO®
Insulating
ROOF TILE

The light weight of Kaylo Roof Tile reduces dead load on buildings and saves steel.

American Structural Products Co., Toledo, Ohio

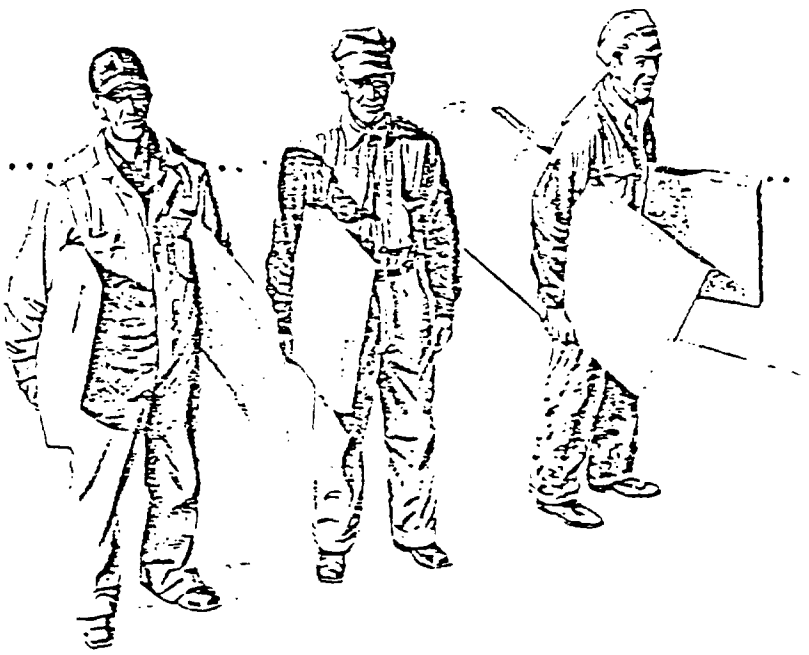
Subsidiary of Owens-Illinois Glass Company



American Structural Products Company
Toledo, Ohio
SUBSIDIARY OF OWENS-ILLINOIS GLASS COMPANY

TABLE OF CONTENTS

Kaylo Roof Tiles have a rare combination of strength and light weight. Tiles are easy to handle, easy to carry. Moving loads of tiles across Kaylo Roof Decks in wheelbarrows or dollies is common practice.



KAYLO®
Insulating
ROOF TILE

SETS A NEW STANDARD FOR LIGHTWEIGHT NON-COMBUSTIBLE ROOF CONSTRUCTION

Kaylo Insulating Roof Tile laid on light steel members now makes available for the first time a roof deck in which fire protection, structural strength and insulation are all provided in a single lightweight all-mineral unit.

LIGHTWEIGHT

Kaylo Roof Tile decks weigh approximately six pounds per square foot, including supporting sub-purlins, or around five pounds to the square foot for the roof tile only.

Thus it is now possible to design a deck made with a non-combustible tile so that the dead load above the main purlins, including an excellent built-up roofing, is about twelve pounds per square foot of roof area.

STRUCTURAL UNIT

Kaylo Roof Tile is not merely a roof insulation. It is a reinforced structural unit designed for a total load of fifty pounds per square foot with an adequate safety factor. Its flexural strength is more than sufficient for typical roof deck requirements.

INSULATES AS IT COVERS

This lightweight roof deck combines structural strength and thermal insulation in one material. Since Kaylo Insulating Roof Tile provides insulation value equal to that of an inch and one-half of standard insulating board, no additional insulation is needed for usual installations. A special operation of applying insulation over the structural deck is thus eliminated.

KAYLO ROOF TILE

FIREPROOF

Kaylo Roof Tile provides a new standard of fire protection for lightweight construction. The tile themselves will withstand building fire temperatures as defined by the standard A. S. T. M. fire curve, for more than one hour without failing in load-carrying capacity and without permitting a temperature rise on the cold side great enough to constitute failure. Fire originating above a Kaylo roof deck is prevented from producing dangerous temperatures within the building for a period of at least one hour.

Because of economy of steel in the supporting structure made possible by a Kaylo roof deck; because of its non-combustibility; because of its insulation value; because of its live-load-carrying capacity in relation to the dead load of the deck; and because it can be erected rapidly; this new roof construction recommends itself to every architect and engineer who has a major roof construction problem today.

FIELD TESTED

Kaylo Insulating Roof Tile has been introduced to the public after several years of experimental development and pilot plant manufacture by the Owens-Illinois Glass Company. In this development an area of several hundred thousand square feet has been incorporated in the construction of Owens-Illinois and American Structural Products buildings, and others, including plants, laboratories, offices and warehouses. Much of it has been in service for several years.

GENERAL DESCRIPTION

Kaylo Insulating Roof Tile is made in one size only, nominally 2½ x 18 x 36 inches. It is white, or whitish in appearance and is made entirely of a non-combustible mineral base which is predominately a calcium silicate, or combination of calcium silicates, into which mineral fibers have been incorporated for reinforcing at the time of manufacture. This fiber-reinforced mass is additionally strengthened by a welded wire mesh placed in the tile at the time it is formed.

The unique cellular structure of Kaylo Insulating Roof Tile makes possible its remarkable combination of desirable characteristics. Kaylo Insulating Roof Tile has cells so small they are measured in fractions of a micron, and so tremendous in number that more than 80% of the tile is composed of air cells which together have a total wall area of more than one hundred acres per cubic foot of tile!

Tile units have a smooth under-surface with a light reflection factor of approximately 80 per cent.

SAVES ERECTION COSTS

Kaylo insulating roof decks are easier to install than conventional decks—yet they require no revolutionary new methods. Workmen like Kaylo Roof Tile.

When American Structural Products sub-purlins are used, a Kaylo Roof Tile deck is applied in only three steps—laying tile into place, grouting end joints and covering the deck with roofing materials. Kaylo Roof Tile can also be used with other types of framing.

No added application of roof insulation is necessary except where special conditions require an unusually high degree of insulation. In such cases light density Kaylo insulation in block form can be mopped in over the Kaylo insulating deck. A two-inch thickness, for example, mopped in over a standard Kaylo insulating deck will provide a U value, or over-all transmission, of approximately 0.10 Btu per hour per square foot per degree difference between inside and outside temperatures.

Kaylo Insulating Roof Tile can be fitted to odd-sized spaces at the job-site without special tools. Any saw which will cut the wires, such as a light power saw, is suitable. Kaylo Roof Tile can be readily chipped or gouged to fit irregular surfaces.

Because of its light weight and convenient size, Kaylo Roof Tile is easy to carry to the place where it is to be laid. It has been designed as a simple, one-man tile and weighs only approximately 23 pounds per tile (having an area of four and one-half square feet).

SPECIFICATIONS, DESIGN DATA AND

American Structural Products

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including steel sub-purlins, grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. Sub-purlins. Steel sub-purlins shall be American Structural Products hollow box sub-purlins No. 102.

Before leaving the shop, all steel work shall be thoroughly cleaned of all loose rust, mill scale and foreign matter and given one coat of approved metal protection applied thoroughly and evenly.

2. Kaylo Roof Tile. Roof tile shall be precast and reinforced Kaylo Roof Tile, 2⅝ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

3. Anchors. Anchors are not required with American Structural Products sub-purlin No. 102.

4. Grout. Grout for end joints of tile shall be composed of the following materials, measured by volume:

	PROPORTIONS Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gallons

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

5. Curbs. Kaylo Insulating Roof Tile 2⅝ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. Sub-purlins. To receive Kaylo Roof Tile, American Structural Products hollow box sub-purlins No. 102 shall be accurately spaced 3'-1" on centers.

Sub-purlins shall be welded to each support with one fillet weld, ¾ inch long placed on alternate sides of sub-purlins. Where joints of sub-purlins do not occur over supports, their ends shall be welded together. Where ends of sub-purlins bear on masonry, they shall be securely anchored to the masonry as shown on the drawings or with one bolt and 2 x 2 x ¼-inch plate washer at each sub-purlin.

2. Kaylo Roof Tile. Kaylo Roof Tile shall be spaced evenly on sub-purlins to provide a minimum end bearing of ½ inch, with that side up which is marked "top." Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc. and grout in place.

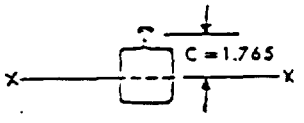
Where necessary to cut standard pieces for fitting, any hand or power saw which will cut the wire mesh is suitable.

3. Grout. Joints at ends of tile over sub-purlins, and at ridges and hips, shall be filled with grout mixed as specified. Where sub-purlin No. 102 is used the stem of the sub-purlin shall be completely surrounded with grout to provide a key anchorage against uplift pressure.

Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

4. Saddles. Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per one hundred square feet of roof.

DESIGN DATA FOR HOLLOW BOX SUB-PURLIN NO. 102



Size	Weight		Spacing	Ix-x In. 4	Iy-y In. 4	Sx-x In. 3
3 1/4" x 2 13/32" 14 ga. Metal	Lb./L.F. 3.00	Lb./S.F. of Roof 1.00	3'-1" On Centers	.955	.584	.541

ALLOWABLE SPANS FOR VARIOUS LOAD CONDITIONS

	Total Load (Per Sq. Ft.)	Span* f = 20,000	Span* f = 18,000	Deflection f = 20,000	Deflection f = 18,000
Southern States & Pacific Slope	32 lb.	9'-8"	9'-3"	.360	.302
Central States	42 lb.	8'-5"	8'-0"	.271	.222
Rocky Mountain & N. E. States	49 lb.	7'-10"	7'-5"	.227	.191
Northwest States	57 lb.	7'-3"	6'-10"	.203	.160

Assumed dead load, per sq. ft. of roof:

Kaylo tile and sub-purlins.....6.0 lb.

Built-up roofing (tar and gravel).....6.0 lb.

Total dead load.....12.0 lb.

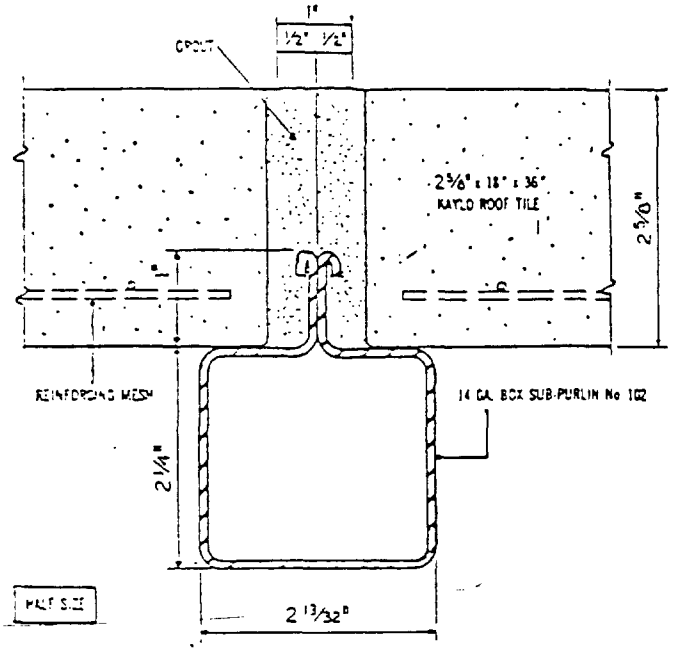
Assumed snow load, on horizontal surface per sq. ft. of roof:

Southern States (live load).....20 lb. per sq. ft.
Central States.....30 lb. per sq. ft.
Rocky Mountains and N. E States.....37 lb. per sq. ft.
Northwest States.....45 lb. per sq. ft.

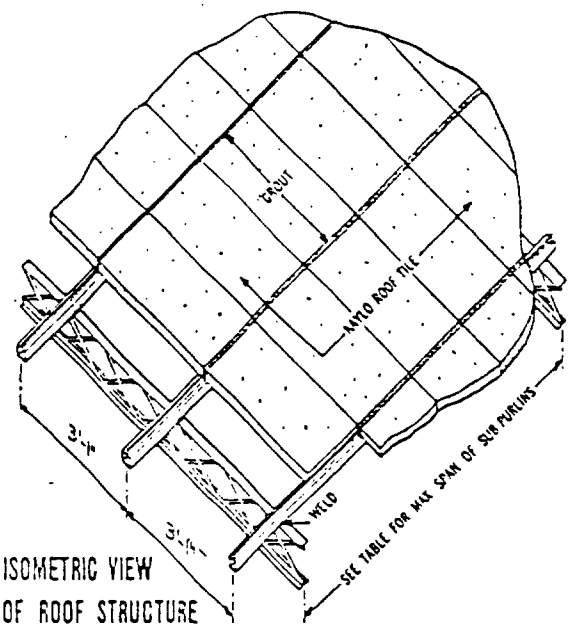
$M = \frac{WL}{10}$

* Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bending occurs, reduce spans.

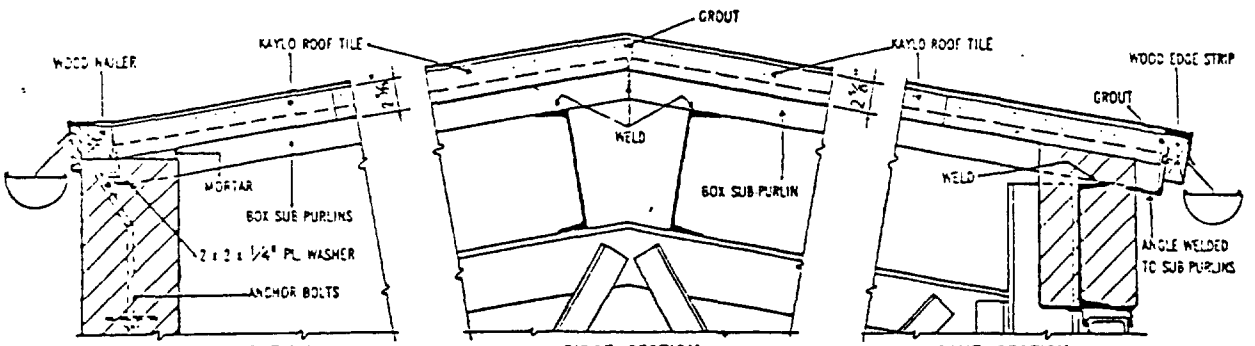
ILS . . . . . KAYLO ROOF TILE



SECTION THROUGH JOINT



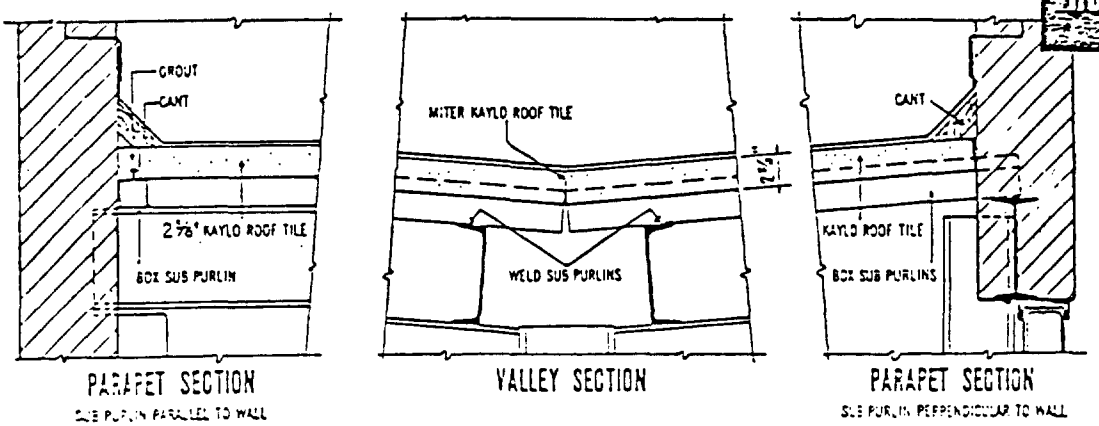
ISOMETRIC VIEW
OF ROOF STRUCTURE



EAVE SECTION
WALL BEARING

RIDGE SECTION

EAVE SECTION
SKELETON FRAME



PARAPET SECTION
SUB PURLIN PARALLEL TO WALL

VALLEY SECTION

PARAPET SECTION
SUB PURLIN PERPENDICULAR TO WALL

Scale ¾" = 1'-0"
Except as noted

SPECIFICATIONS, DESIGN DATA AND

Rail Sub-Purlin No. 101

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including steel sub-purlins, grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. Sub-purlins. Steel sub-purlins shall be American Structural Products structural steel rail sections No. 101.

Before leaving the shop, all steel work shall be thoroughly cleaned of all loose rust, mill scale and foreign matter and given one coat of approved metal protection applied thoroughly and evenly.

2. Kaylo Roof Tile. Roof tile shall be precast and reinforced Kaylo Roof Tile, 2⅝ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

3. Anchors. Anchors are not required with American Structural Products sub-purlins No. 101.

4. Grout. Grout for end joints of tile shall be composed of the following materials, measured by volume:

	PROPORTIONS	
	Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gallons

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

5. Curbs. Kaylo Insulating Roof Tile 2⅝ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. Sub-purlins. To receive Kaylo Roof Tile, American Structural Products rail sub-purlins No. 101 shall be accurately spaced 3'-1¼" on centers.

Sub-purlins shall be welded to each support with one fillet weld, ¾ inch long placed on alternate sides of sub-purlins. Where joints of sub-purlins do not occur over supports, their ends shall be welded together. Where ends of sub-purlins bear on masonry, they shall be securely anchored to the masonry as shown on the drawings or with one bolt at each sub-purlin.

2. Kaylo Roof Tile. Kaylo Roof Tile shall be spaced evenly on sub-purlins to provide a minimum end bearing of ½ inch, with that side up which is marked "top." Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc. and grout in place.

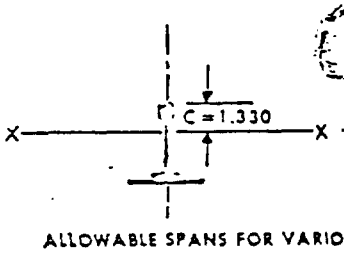
Where necessary to cut standard pieces for fitting, any hand or power saw which will cut the wire mesh is suitable.

3. Grout. Joints at ends of tile over sub-purlins, and at ridges and hips, shall be filled with grout mixed as specified. Where sub-purlin No. 101 is used the stem of the sub-purlin shall be completely surrounded with grout to provide a key anchorage against uplift pressure.

Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

4. Saddles. Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per one hundred square feet of roof.

DESIGN DATA FOR RAIL SUB-PURLIN NO. 101



Size	Weight		Spacing	Ix-x In. 4	Iy-y In. 4	Sx-x In. 3
	Lb./LF.	Lb./S.F. of Roof				
2-1/4" x 2-3/8"	3.3	1.1	3'-1-1/4" On Centers	.694	.182	.522

ALLOWABLE SPANS FOR VARIOUS LOAD CONDITIONS

	Total Load (Per Sq. Ft.)	Span*		Deflection	
		f = 20,000	f = 18,000	f = 20,000	f = 18,000
Southern States & Pacific Slope	32 lb.	9'-6"	9'-0"	.454	.370
Central States	42 lb.	8'-4"	7'-10"	.358	.279
Rocky Mountain & N.E. States	49 lb.	7'-9"	7'-4"	.310	.248
Northwest States	57 lb.	7'-2"	6'-9"	.258	.208

Assumed dead load, per square foot of roof:

Kaylo tile and sub-purlins..... 6.0 lb.

Built-up roofing (tar and gravel)..... 6.0 lb.

Total dead load.....12.0 lb.

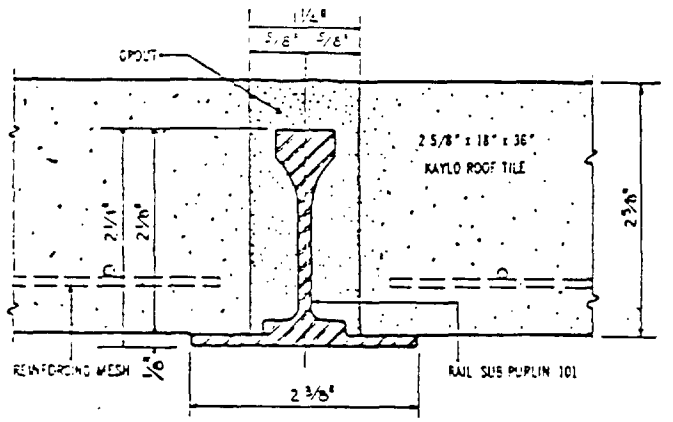
Assumed snow load on horizontal surface per square foot of roof:

Southern States and Pacific Slope (live load)..20 lb. per sq. ft.
Central States.....30 lb. per sq. ft.
Rocky Mountains and N.E. States.....37 lb. per sq. ft.
Northwest States.....45 lb. per sq. ft.

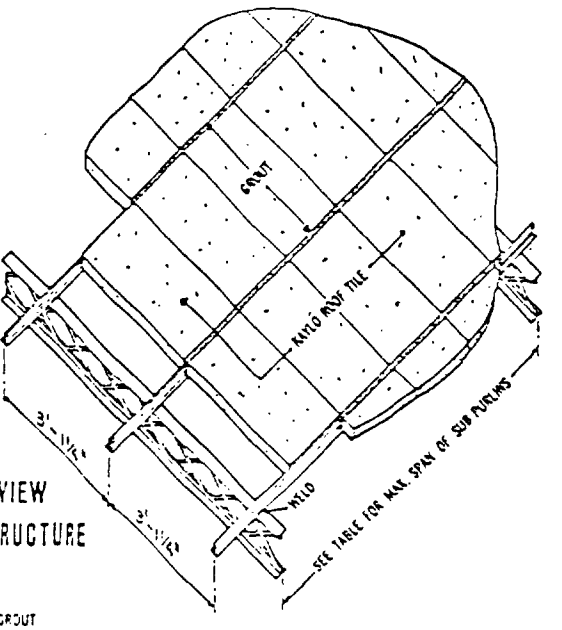
$M = \frac{WL}{10}$

*Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bending occurs, reduce span.

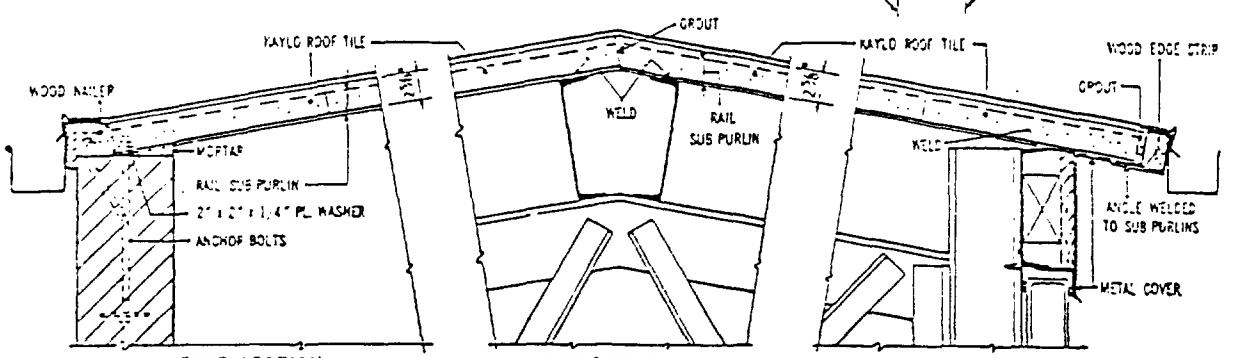
RAIL ROOF TILE



SECTION THROUGH JOINT



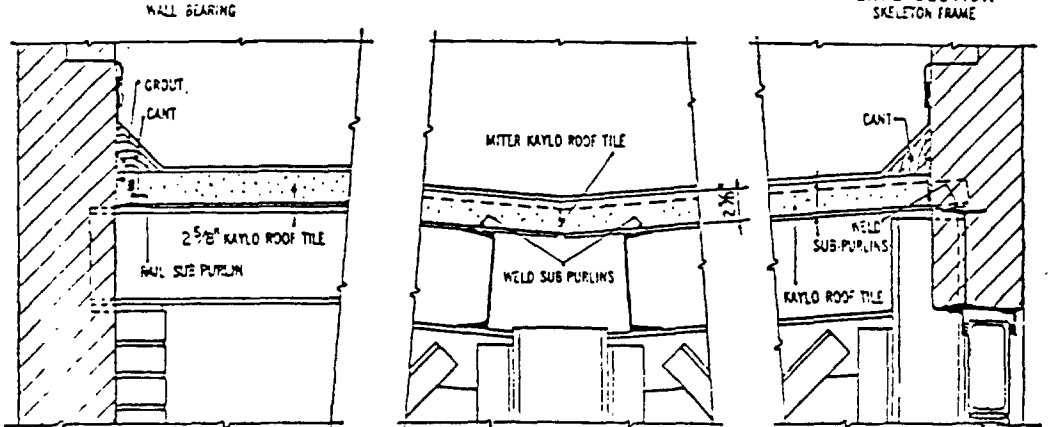
ISOMETRIC VIEW
OF ROOF STRUCTURE



EAVE SECTION
WALL BEARING

RIDGE SECTION

EAVE SECTION
SKELETON FRAME



PARAPET SECTION
SUB PURLIN PARALLEL TO WALL

VALLEY SECTION

PARAPET SECTION
SUB PURLIN PERPEND. TO WALL

Scale ¾" = 1'-0"
Except as noted

SPECIFICATIONS, DESIGN DATA AND

Standard Structural Members

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including (bent studs) (staple clips) (nails), grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. Kaylo Roof Tile.

Roof tile shall be precast and reinforced Kaylo Roof Tile, 2⅝ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

2. Anchorage Materials.

(Select one which applies to details used.)

ab. Bent Studs (for trussed purlins or standard structural shapes)

Bent studs shall be 1½" x 1½" N. T. Bent O. L. E. Studs. (Not threaded; outside loaded end.) Each stud shall have a suitable ferrule. Studs and ferrules shall be as manufactured by Nelson Stud Welding Corp., or approved equal.

c. Nails (for wood framing)

Nails for fastening Kaylo Roof Tile to wood framing members shall be 20d common x 4" long.

d. Nails (for Stran-Steel)

Nails for fastening Kaylo Roof Tile to Stran-Steel shall be 12d common x 3" long.

dd. Staples (for Stran-Steel)

Staples shall be #12 ga. (.105) mill galv. steel wire at least 3" long and 1" wide.

3. Grout.

Grout for end joints of tile shall be composed of the following materials, measured by volume:

	PROPORTIONS	
	Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gal.

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

NOTE: Reduce water content when using Stran-Steel. (Minimum quantity, 4 gallons per batch.)

4. Curbs.

Kaylo Insulating Roof Tile 2⅝ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. Purlins (or joists).

Purlins or joists shall be furnished and installed by others. They shall be accurately spaced 3'-0½" on centers to receive Kaylo Roof Tile.

2. Kaylo Roof Tile.

Kaylo Roof Tile shall be spaced on sub-purlins or joists to provide an end bearing of at least ½ inch, with that side up which is marked "top." Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc., and grout in place.

Where necessary to cut standard pieces, any hand or power saw which will cut the wire mesh is suitable.

3. Anchorage.

(Select one which applies to details used.)

ab. Bent Studs (for trussed purlins or standard structural shapes)

Bent Studs shall be securely welded to the top chord of purlins by the Nelson Gun Stud Welder or other approved method. They shall be spaced 9" o. c. and lined up accurately on each purlin.

c. Nails (for wood framing)

Nails shall be spaced 9" o. c. Two nails at each end of tile shall be driven vertically through roof tile and sunk so that heads are flush with top of tile.

d. Nails (for Stran-Steel)

Nails shall be spaced 3" o. c. and driven into Stran-Steel a minimum of 1¼". The heads of the nails shall project above the Stran-Steel a minimum of 1½".

dd. Staples (for Stran-Steel)

Staples shall be spaced 3" on centers and driven into Stran-Steel a minimum of 1¼". Staples shall project above Stran-Steel a minimum of 1½".

4. Grout.

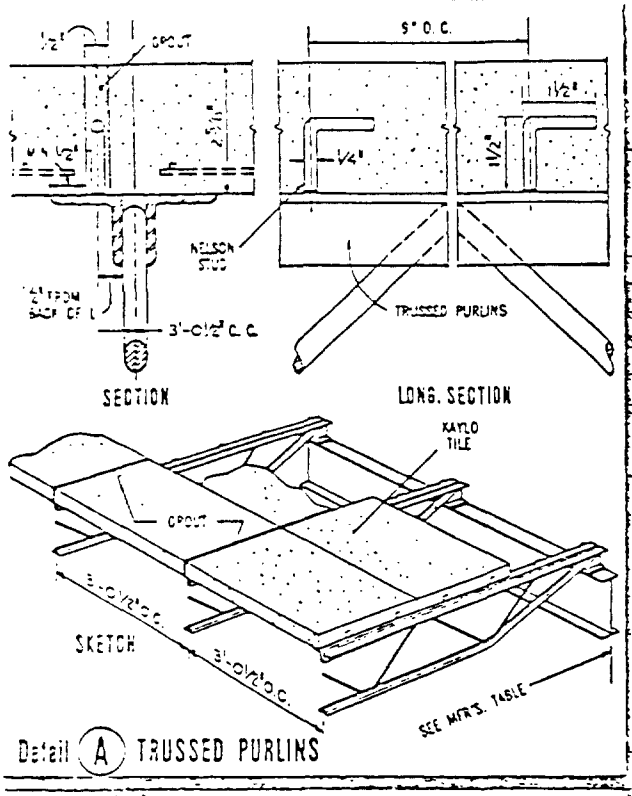
Joints at ends of tile over purlins or joists, and at ridges and hips, shall be filled with grout mixed as specified. The grout shall completely fill the joint over the purlins so that the (bent studs) (nails) (staples) are entirely encased in grout to provide anchorage against uplift pressure.

Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

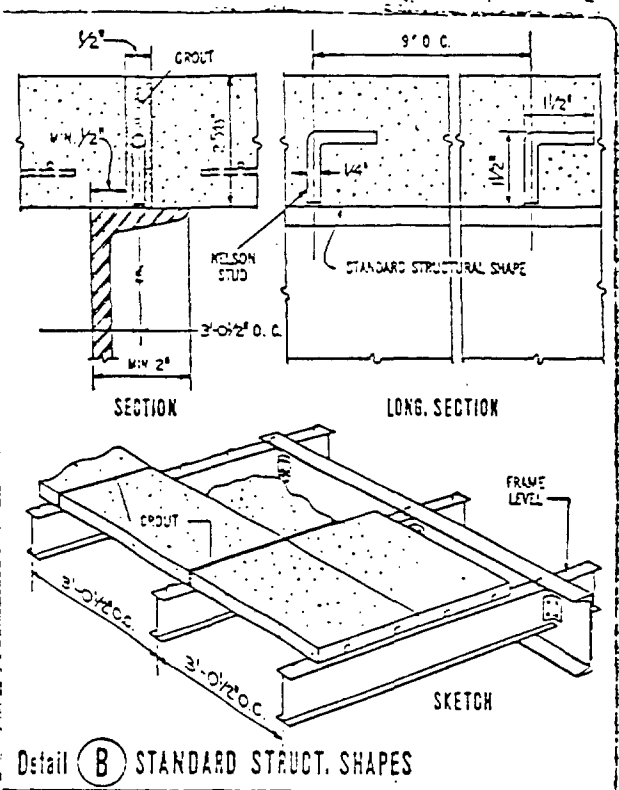
5. Saddles.

Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per hundred square feet of roof.

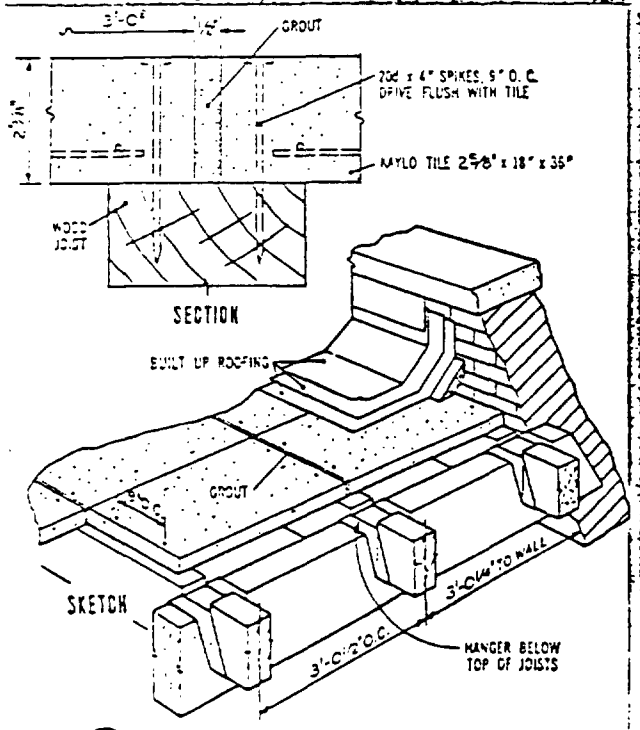
...... KAYLO ROOF TILE



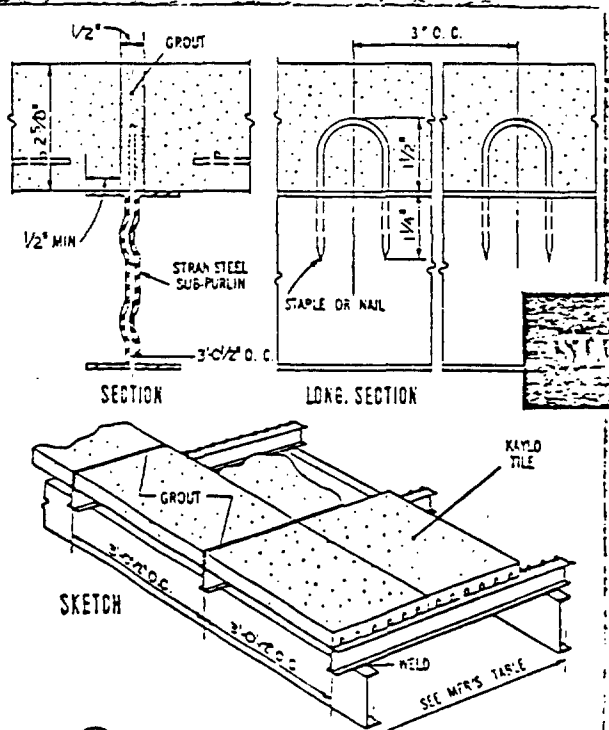
Detail (A) TRUSSED PURLINS



Detail (B) STANDARD STRUCT. SHAPES

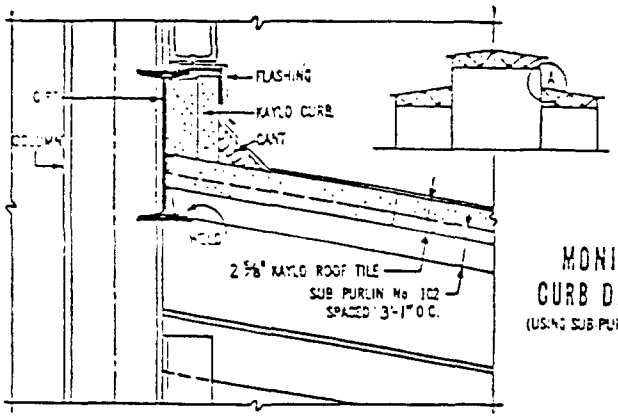


Detail (C) SLOW BURNING CONST.



Detail (D) STRAN-STEEL SUB-PURLINS

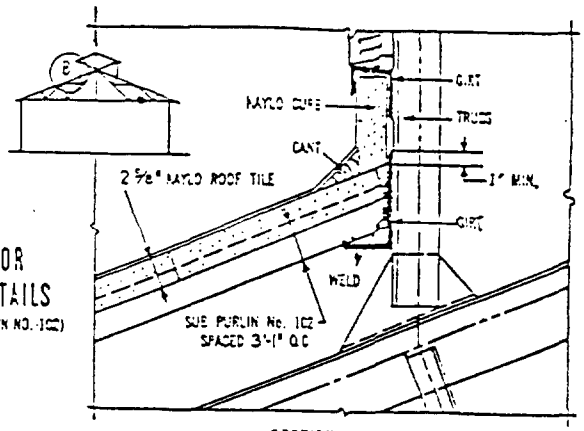
Scale 3" = 1'-0"
Except as noted



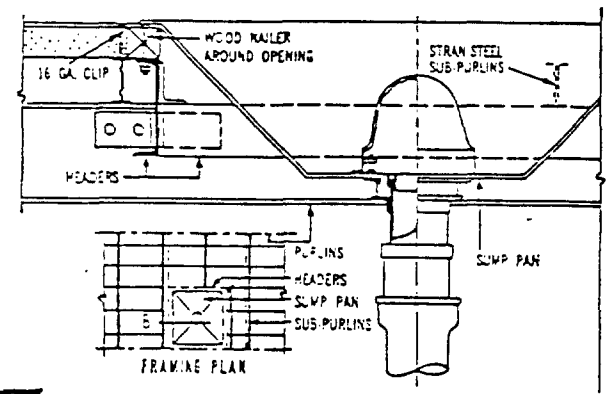
SECTION—"A"

MONITOR CURB DETAILS

(USING SUB-PURLIN NO. 102)



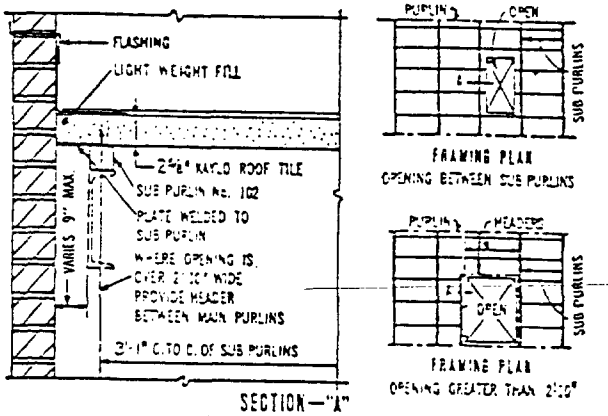
SECTION—"B"



SECTION—"B"

FRAMING FOR SUMP PAN

(USING STRAN STEEL SUB PURLINS)



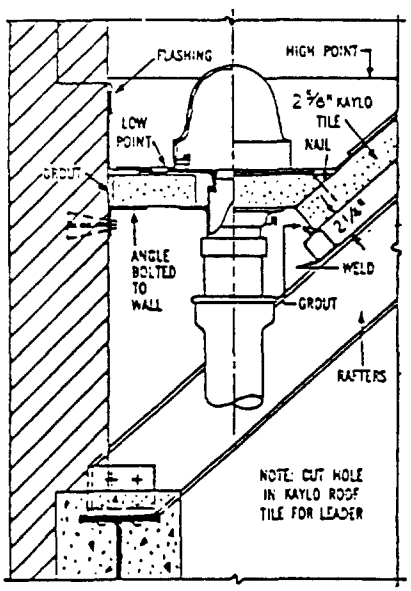
SECTION—"A"

FRAMING AROUND OPENINGS

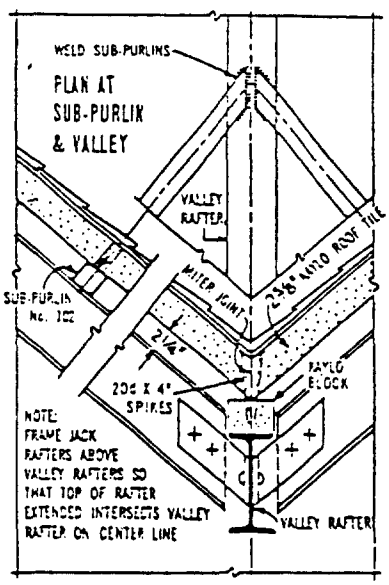
(USING SUB-PURLIN No. 102)

DETAILS

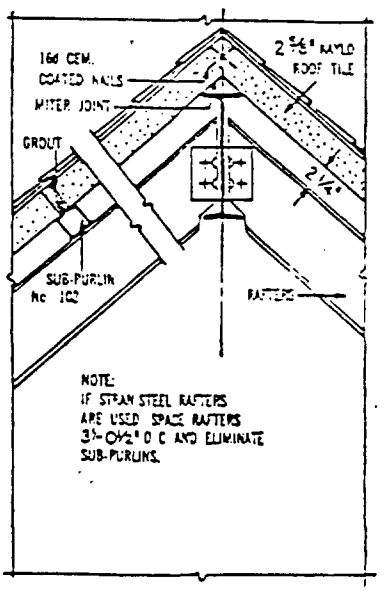
Scale 3/4" = 1'-0"
except as noted



PARAPET DETAIL
(SHOWING ROOF DRAIN)



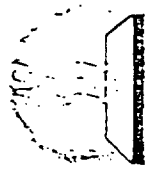
VALLEY DETAIL



RIDGE DETAIL

DETAILS FOR STEEP PITCHED ROOFS—RAFTER FRAMING

TECHNICAL DATA KAYLO ROOF TILE



INSULATING VALUE

Thermal conductivity "K" (Btu./sq. ft./hr./°F./in.).....0.62

Overall heat transf. coef. "U" (Btu./sq. ft./hr./°F./thickness)

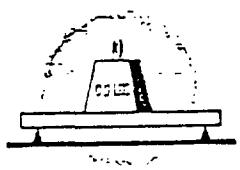
Roof tile only.....0.20

Roof tile + built-up roofing.....0.19

Roof tile + 1½" insulation* + built-up roofing.....0.11

Roof tile + 2" insulation + built-up roofing.....0.10

*11-lb. density Kaylo Insulation



STRENGTH

FLEXURAL STRENGTH This table shows the factor of safety and deflection of Kaylo Insulating Roof Tile for several uniformly distributed loads.

CLEAR SPAN=34 INCHES - DEFLECTION FOR 1/360 OF SPAN=.0945 INCHES

TOTAL UNIFORM LOAD (LB./SQ. FT.)	FACTOR OF SAFETY ULTIMATE	DEFLECTION (INCHES)
40	11.1	.023
45	9.9	.026
50	8.9	.029
55	8.0	.032
60	7.4	.035

MODULUS OF RUPTURE. The average modulus of rupture for Kaylo Roof Tile is 175 lb. per sq. in.

MODULUS OF ELASTICITY. The average modulus of elasticity for Kaylo Roof Tile is 160,000 lb. per sq. in.

COMPRESSIVE STRENGTH. The average compressive strength for Kaylo Roof Tile is 500 lb. per sq. in.

FIRE RESISTANCE

Kaylo Roof Tile is non-combustible. It will resist a typical building fire, as defined in the standard A.S.T.M. time-temperature curve, for more than one hour. Thus, a fire originating on the top side can burn off the applied covering and the fire resistance of the tile will enable the tile to carry its required load for more than one hour and at the same time protect the interior from excessive temperature rise. For a fire originating within the building the limit of endurance is the limit of the supporting steel or the limit of the construction immediately below the roof deck.

WEIGHT

Approximate weight per square foot (lb.)..... 5.0

Approximate density (lb. per cu. ft.).....20.5

Approximate weight per tile (lb.).....23.0

DIMENSIONAL STABILITY

DIMENSIONAL CHANGE DUE TO MOISTURE. The linear expansion of Kaylo Roof Tile after repeated cycles of soaking and drying is approximately .04 of 1%. This equals an increase in length for a standard tile of only fourteen-thousandths of an inch.

STRENGTH WHEN WET. The flexural strength of Kaylo Roof Tile when soaking wet (after soaking for 10 hours) is approximately 85% of its normal strength.

NAIL-HOLDING POWER

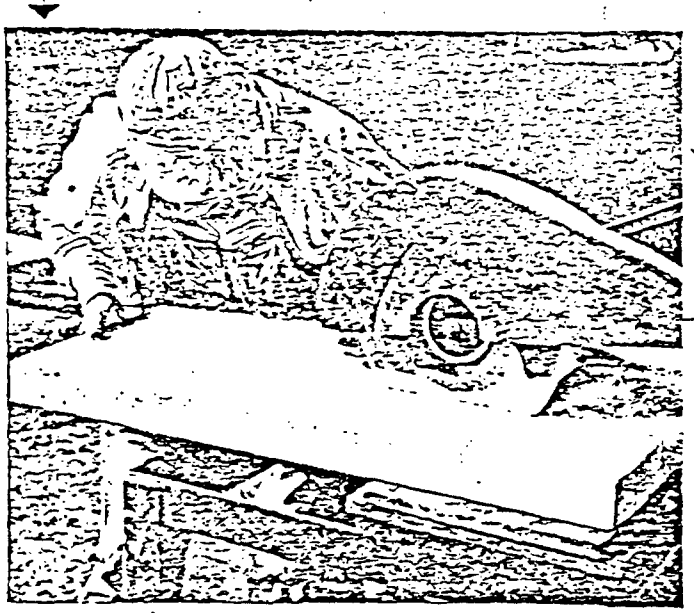
RESISTANCE TO DIRECT NAIL WITHDRAWAL (SMOOTH NAILS)

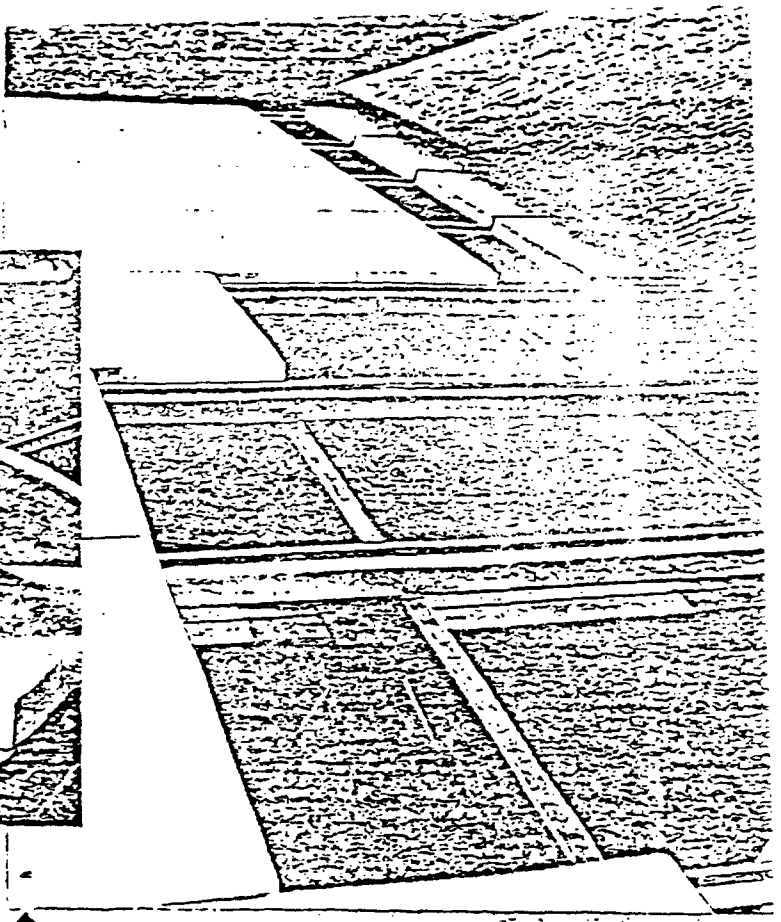
Size of Nail	6d	7d	8d	9d	10d	12d	16d	20d	30d	40d
Diameter in Inches	.113	.113	.131	.131	.148	.148	.162	.192	.207	.225
Resistance of Kaylo Roof Tile (Total Pull in Lbs. per Inch Penetration).	20	20	23	23	26	26	28	32	36	40

LIGHT REFLECTIVITY

Light reflectivity of Kaylo Roof Tile is approximately 80%.

Cutting of Kaylo Roof Tile to fit odd spaces is easily accomplished with a power saw or a hand saw. Tile can be cut or gouged with a knife to fit over rivet heads or other irregular surfaces.





The light weight of Kaylo Roof Tile reduces dead load on buildings and saves steel.

KAYLO®

Insulating

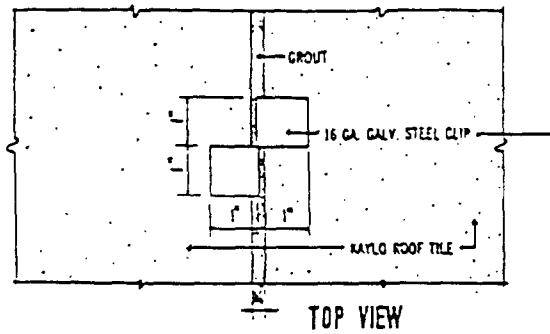
ROOF TILE

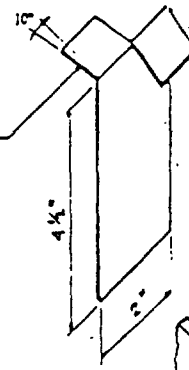
American Structural Products Co., Toledo, Ohio

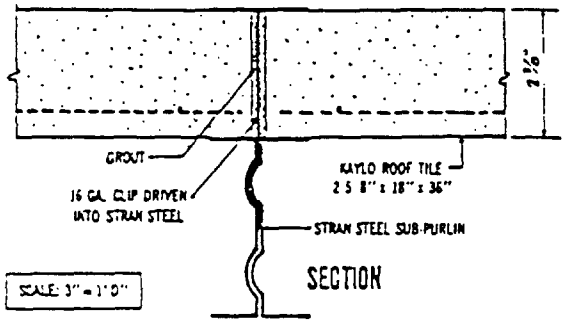
Subsidiary of Owens-Illinois Glass Company

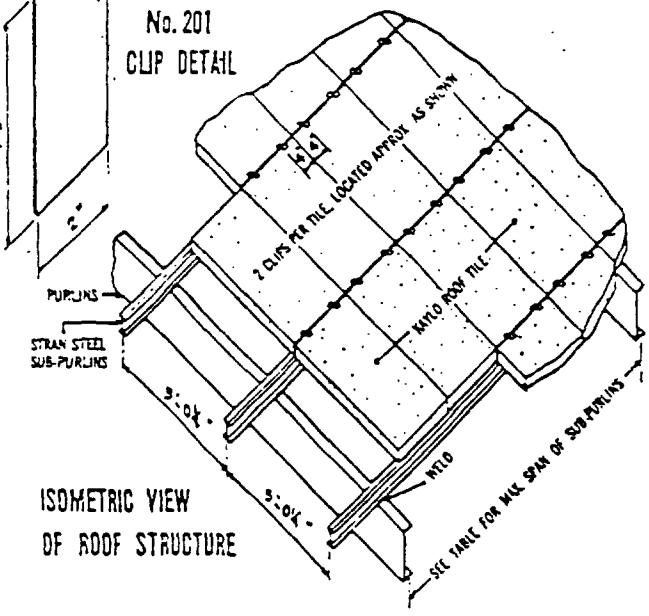
Bulletin K-1:0
Issued March 15, 1948

KAYLO ROOF TILE DETAILS WITH STRAN-STEEL SUB-PURLINS

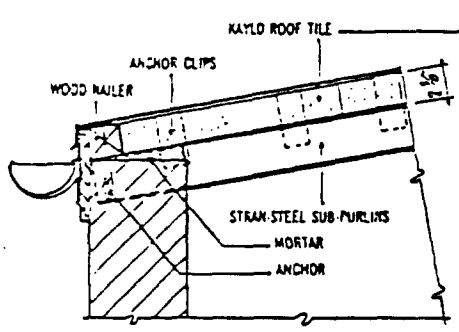


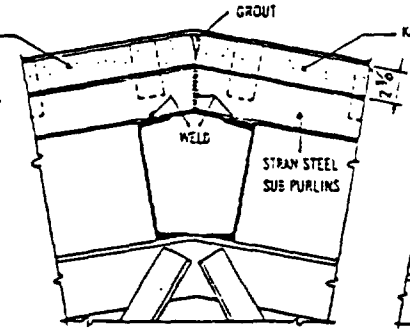


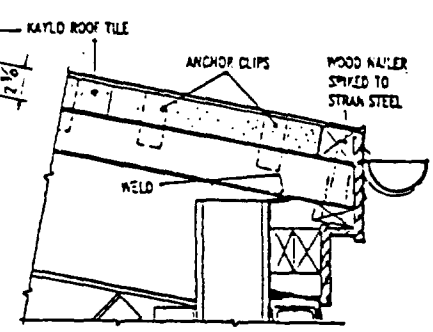


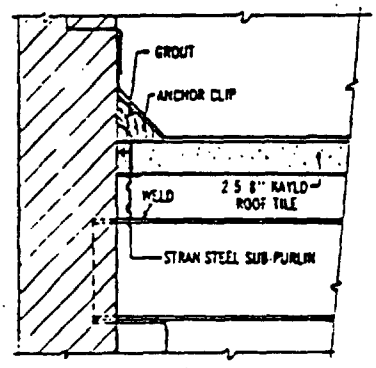


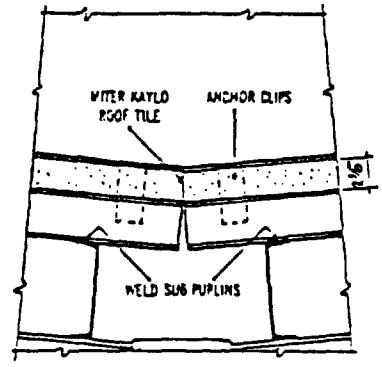
DETAILS OF ANCHORS TO STRAN-STEEL SUB-PURLINS

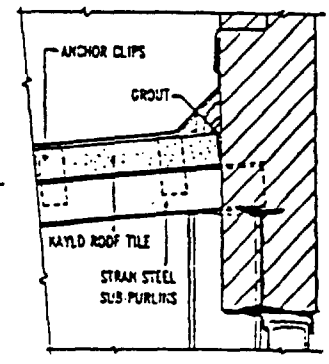












TYPICAL CONSTRUCTION DETAILS

SCALE 3 3" = 1'0"

SEE REVERSE SIDE FOR SPECIFICATIONS AND DATA

KAYLO INSULATING ROOF TILE SPECIFICATIONS

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including steel sub-purlins, grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. **Sub-purlins.** Steel sub-purlins shall be Stran-Steel joists of sizes shown on the drawings.

Before leaving the shop, all steel work shall be thoroughly cleaned of all loose rust, mill scale and foreign matter and given one coat of approved metal protection applied thoroughly and evenly.

2. **Kaylo Roof Tile.** Roof tile shall be precast and reinforced Kaylo Roof Tile, 2½ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

3. **Anchors.** Anchors to Stran-Steel joists shall be 16-gauge galvanized steel drive clips No. 201, as furnished by American Structural Products Company.

4. **Grout.** Grout for end joints of tile shall be composed of the following materials, measured by volume:

	Proportions Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water	0.55	4 gallons

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

5. **Curbs.** Kaylo Insulating Roof Tile 2½ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. **Sub-purlins.** To receive Kaylo Roof Tile, Stran-Steel sub-purlins shall be accurately spaced 3'-0¼" on centers.

Sub-purlins shall be welded to each support with one fillet weld, ¾ inch long placed on alternate sides of sub-purlins. Where joints of sub-purlins do not occur over supports, their ends shall be welded together. Where ends of sub-purlins bear on masonry, they shall be securely anchored to the masonry as shown on the drawings or with one-half inch diameter hook-bolt at each sub-purlin built into the masonry.

2. **Kaylo Roof Tile.** Kaylo Roof Tile shall be spaced evenly on sub-purlins to provide a minimum end bearing of ½-inch, with that side up which is marked "top". Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc., and grout in place.

Tiles shall be kept dry while being laid and before and during application of roofing.

Tiles may be cut with a hand saw or power saw where necessary to cut standard pieces.

3. **Anchors.** Ends of tile shall be secured to sub-purlins with two anchors, No. 201, per eighteen-inch tile. Anchors shall be spaced three inches from each edge of tile. Drive anchors down tightly so that flanges are practically flush with top of Kaylo Roof Tile.

4. **Grout.** Joints at end of tile over sub-purlins, and at ridges and hips, shall be filled with grout mixed as specified.

Grout shall be poured from a spouted can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

5. **Saddles.** Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per one hundred square feet of roof.

DESIGN DATA FOR KAYLO ROOF DECKS

KAYLO ROOF TILE

Size	2½" x 18" x 36"
Weight (21 lb. tile), Approx.	4¾ lb. per sq. ft.
Density, Approx.	20 lb. per cu. ft.
Reinforcing	3"x3"x10 ga. galv. welded wire mesh
Specific Heat	0.22 Btu per lb. per °F.
Av. Modulus of Rupture	180 lb. per sq. inch
Av. Crushing Strength	500 lb. per sq. inch
Av. Mod. of Elasticity	160,000 lb. per sq. inch
Light Reflection	Approx. 85%

OVER-ALL COEFFICIENT OF HEAT TRANSMISSION

"U" BTU/SQ.FT./HOUR/°F

Bare Tile	0.20
Tile + Built-up Roofing	0.19
Tile + 1" Insulation* + Built-up Roofing	0.13
Tile + 1½" Insulation + Built-up Roofing	0.11
Tile + 2" Insulation + Built-up Roofing	0.10

*11 lb. density Kaylo Insulation.

STRAN-STEEL SUB-PURLIN

Size	Weight Lb./L.F.	Weight Lb./S.F.	Spacing	Ix-x In. 4	Iy-y In. 4	Sx-x In. 3
2" Flange, 3¼" deep, 16 ga.	2.244	.75	3'-0¼" On Center	1.163	.090	.641

ALLOWABLE SPANS FOR VARIOUS LOAD CONDITIONS

	Southern States and Pacific Slope	Central States	Rock. Mount. and N. E. States	Northwest States
Total Load (Per Sq. Ft.)	32 lb.	42 lb.	49 lb.	57 lb.
Span*	10'-6"	9'-2"	8'-6"	7'-10"
Deflection	.31"	.24"	.21"	.17"

*Use cross-bracing according to Stran-Steel specs. Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bearing occurs, reduce spans.

Assumed dead load: 12 lb. per sq. ft. of roof made up as follows:

Kaylo Tile and Sub-purlins	6.0 lb.
Built-up Roofing (tar and gravel)	6.0 lb.
Total dead load	12.0 lb.

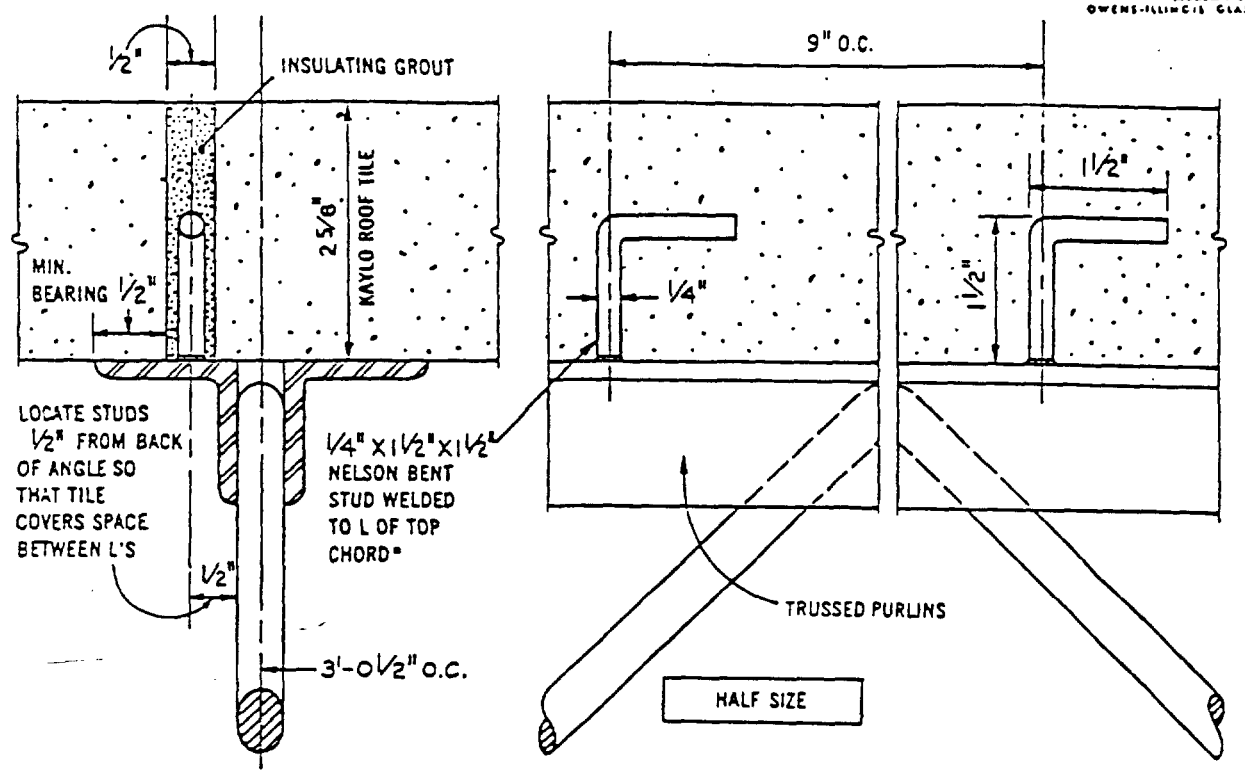
Assumed snow load on horizontal surface:

Southern States (live load)	20 lb. per sq. ft.
Central States	30 lb. per sq. ft.
Rocky Mountains and N. E. states	37 lb. per sq. ft.
Northwest States	45 lb. per sq. ft.

$M = \frac{W1}{10}$ f = 20,000 lb. per sq. inch.

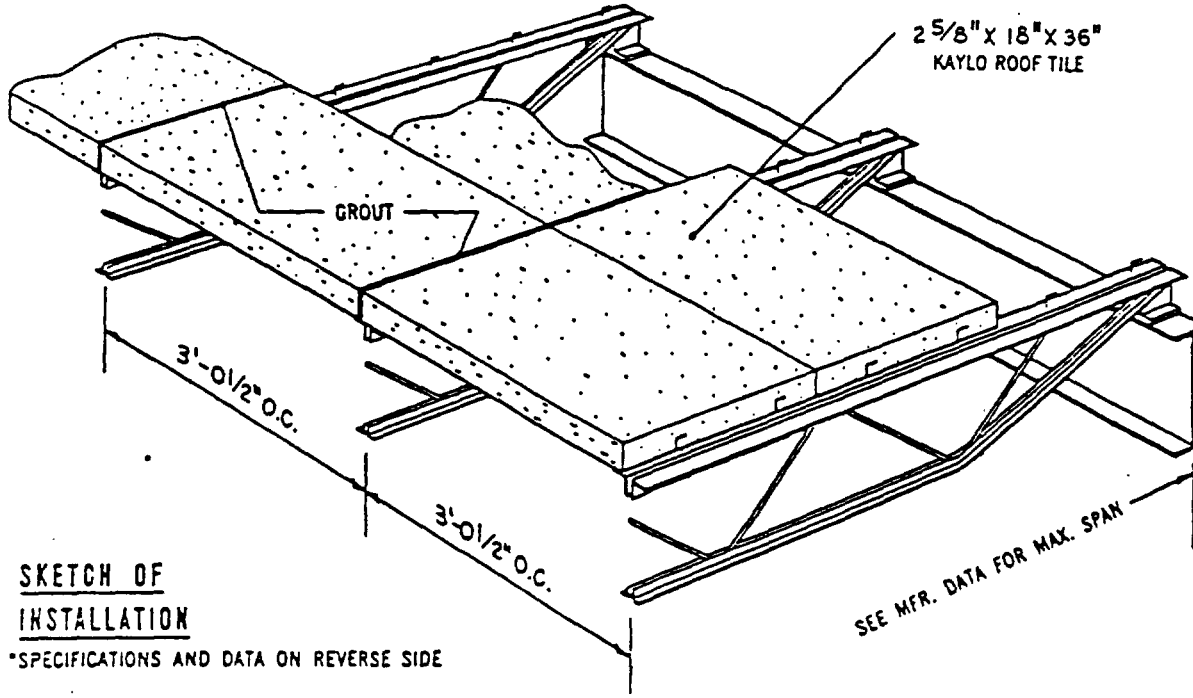
Bulletin R-1:4
Issued July 1, 1948

KAYLO ROOF TILE—DETAILS WITH TRUSSED PURLINS



CROSS SECTION

LONGITUDINAL SECTION



SKETCH OF INSTALLATION

*SPECIFICATIONS AND DATA ON REVERSE SIDE

NOTE: IF TOP CHORD IS ONE PIECE LOCATE STUDS ON CENTER LINE OF JOIST

KAYLO INSULATING ROOF TILE SPECIFICATIONS

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including bent studs, grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. Bent Studs

Bent Studs shall be 1½" x 1½" N.T. Bent O.L.E. Studs. (Not threaded; outside loaded end). Each stud shall have a suitable ferrule. Studs and ferrules shall be as manufactured by Nelson Stud Welding Corp., or approved equal.

2. Kaylo Roof Tile

Roof tile shall be precast and reinforced Kaylo Roof Tile, 2⅝ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

3. Grout

Grout for end joints of tile shall be composed of the following materials, measured by volume:

	Proportions Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gal.

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

4. Curbs

Kaylo Insulating Roof Tile 2⅝ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. Trussed Purlins

Trussed Purlins shall be furnished and installed by others. They shall be accurately spaced 3'-0½" on centers to receive Kaylo Roof Tile.

Trussed purlins shall be adequately braced to prevent lateral deflection. The ends of trussed purlins shall have a bearing of at least 4 inches on masonry or concrete and 2½ inches on steel supports and each purlin shall be securely anchored to its support.

2. Bent Studs

Bent Studs shall be securely welded to the top chord of purlins by the Nelson Gun Stud Welder or other approved method. They shall be spaced 9" o.c. and lined up accurately on each purlin.

3. Kaylo Roof Tile

Kaylo Roof Tile shall be spaced on purlins to provide an end bearing of at least ½ inch, with that side up which is marked "top". Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc., and grout in place.

Where necessary to cut standard pieces, any hand or power saw which will cut the wire mesh is suitable.

4. Grout

Joints at ends of tile over trussed purlins, and at ridges and hips, shall be filled with grout mixed as specified. The grout shall completely fill the joint over the purlins so that the bent studs are entirely encased in grout to provide anchorage against uplift pressure.

Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

5. Saddles

Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per hundred square feet of roof.

DESIGN DATA FOR KAYLO ROOF TILE

PHYSICAL CHARACTERISTICS

Size ..... 2⅝" x 18" x 36"
Weight, (23 lb. tile)
Approx. . . 5 lb. per sq. ft.
Density, approx. ..... 20½ lb. per cu. ft.
Reinforcing 3"x3"x10 ga. galv. welded wire mesh
Specific heat. . . . . 0.22 Btu per lb. per °F.
Av. modulus of rupture 175 lb. per sq. inch
Av. crushing strength .500 lb. per sq. inch
Av. mod. of elasticity . . . 160,000 lb. per sq. inch
Light reflection ..... approx. 80%

OVER-ALL COEF. OF HEAT TRANS.

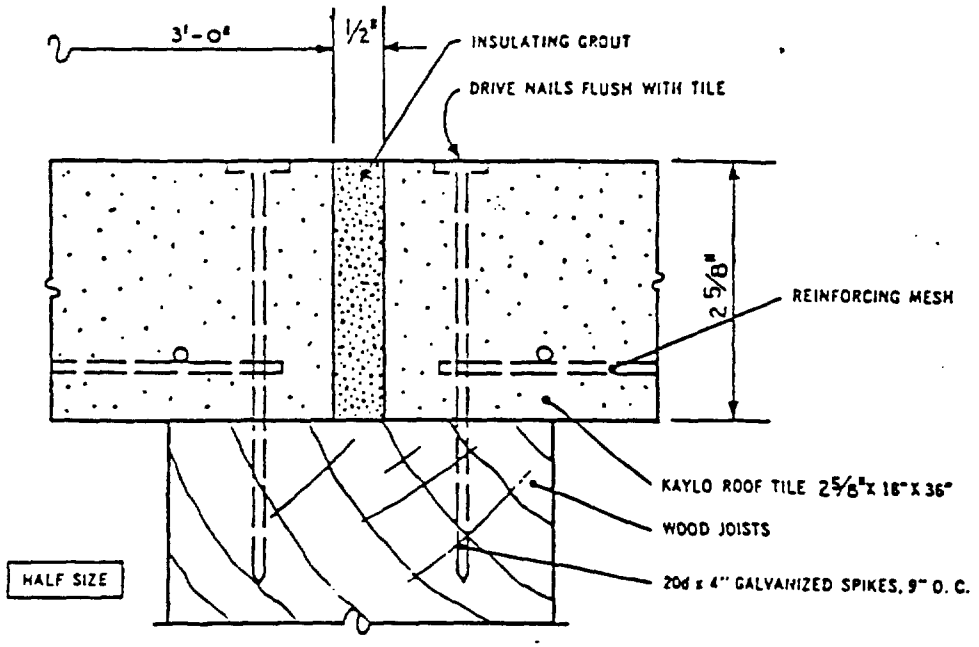
Bare tile	0.20
Tile + built-up roofing	0.19
Tile + 1½" insulation* + built-up roofing*	0.11
Tile + 2" insulation + built-up roofing	0.10

*11 lb. density Kaylo Insulation.

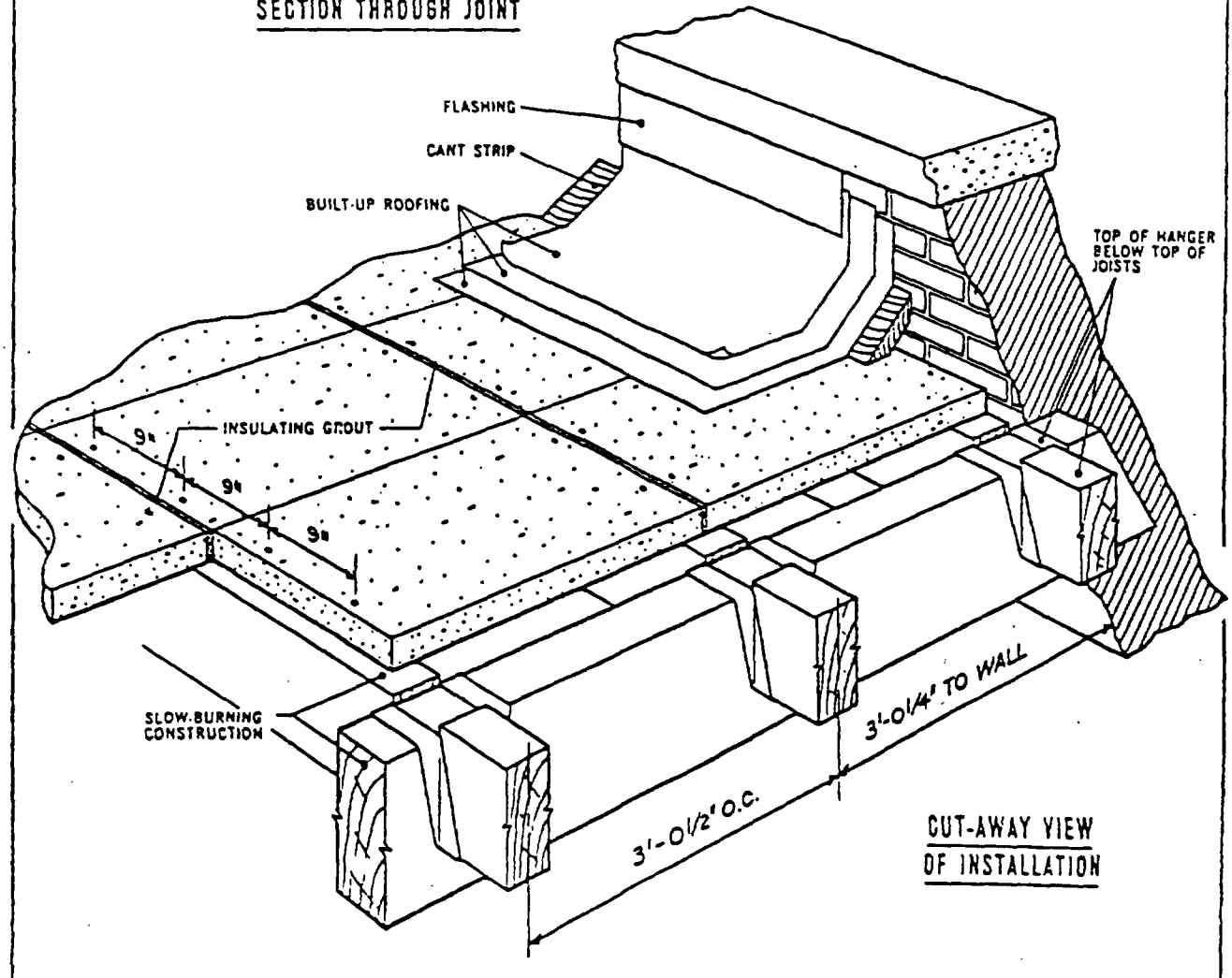
"U" BTU/SQ. FT./HOUR/°F.

FOR TRUSS SPANS, SEE TRUSS MFR'S SPECIFICATIONS

KAYLO ROOF TILE DETAILS · SLOW-BURNING CONSTRUCTION



SECTION THROUGH JOINT



CUT-AWAY VIEW OF INSTALLATION

SEE REVERSE SIDE FOR SPECIFICATIONS AND DATA

KAYLO INSULATING ROOF TILE SPECIFICATIONS

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including nails, grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. Kaylo Roof Tile

Roof tile shall be precast and reinforced Kaylo Roof Tile, 2⅜ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

2. Grout

Grout for end joints of tile shall be composed of the following materials, measured by volume:

	Proportions Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gal.

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

3. Curbs

Kaylo Insulating Roof Tile 2⅜ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. Wood Purlins or Joists

Wood purlins shall be furnished and installed by others. They shall be accurately spaced 3'-0½" on centers to receive Kaylo Roof Tile.

Wood purlins shall be adequately braced to prevent lateral deflection.

2. Kaylo Roof Tile

Kaylo Roof Tile shall be spaced on purlins to provide an end bearing of at least ½ inch, with that side up which is marked "top". Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc., and grout in place.

Where necessary to cut standard pieces, any hand or power saw which will cut the wire mesh is suitable.

Secure each tile to wood joists with two nails at each bearing. Nails shall be 20d x 4" long and spaced approximately 9" o.c. Drive nail heads flush with surface of tile.

3. Grout

Joints at ends of tile, at ridges and hips, and where shown on the drawing shall be filled with grout mixed as specified. The grout shall completely fill the joints.

Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

4. Saddles

Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per hundred square feet of roof.

DESIGN DATA FOR KAYLO ROOF TILE

PHYSICAL CHARACTERISTICS

Size	2⅜" x 18" x 36"
Weight (23 lb. tile) Approx.	5 lb. per sq. ft.
Density, approx.	20½ lb. per cu. ft.
Reinforcing	3"x3"x10 ga. galv. welded wire mesh
Specific heat	0.22 Btu per lb. per °F.
Av. modulus of rupture	175 lb. per sq. inch
Av. crushing strength	500 lb. per sq. inch
Av. mod. of elasticity	160,000 lb. per sq. inch
Light reflection	approx. 80%

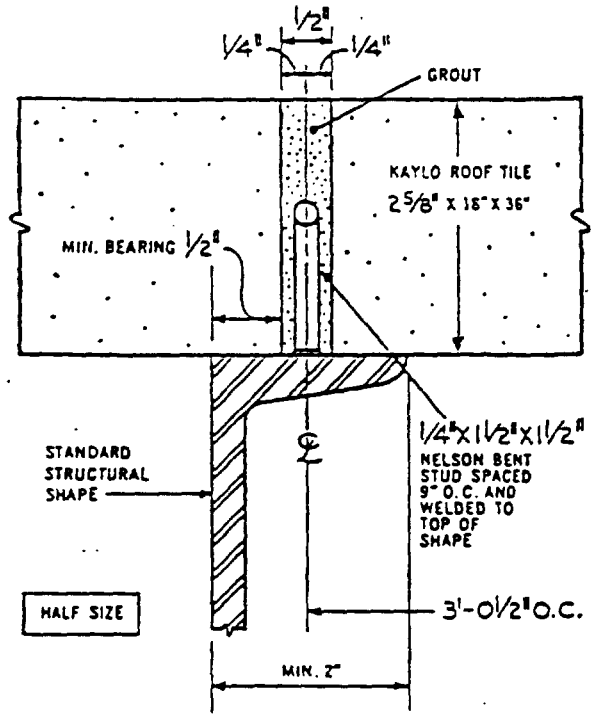
OVER-ALL COEF. OF HEAT TRANS.

Bare tile	0.20
Tile + built-up roofing	0.19
Tile + 1½" insulation* + built-up roofing	0.11
Tile + 2" insulation + built-up roofing	0.10

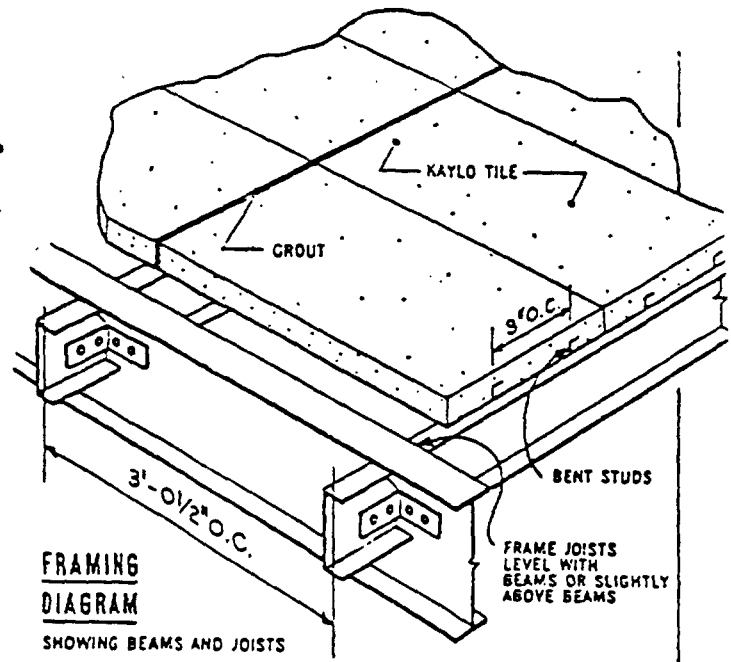
*11 lb. density Kaylo Insulation.

"U" BTU/SQ. FT./HOUR/°F.

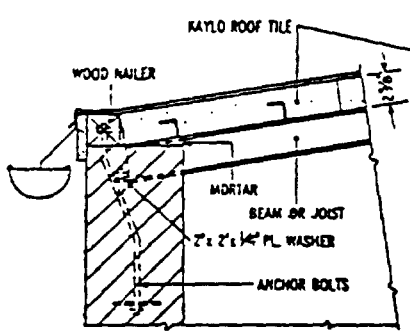
KAYLO ROOF TILE DETAILS · STANDARD STRUCTURAL SHAPES



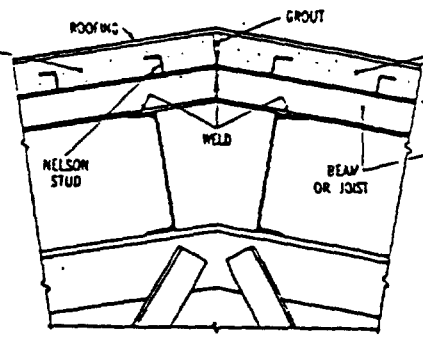
SECTION THROUGH JOINT



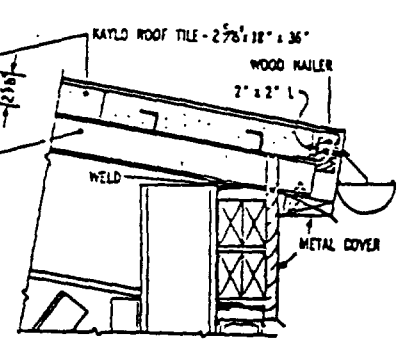
FRAMING DIAGRAM
SHOWING BEAMS AND JOISTS



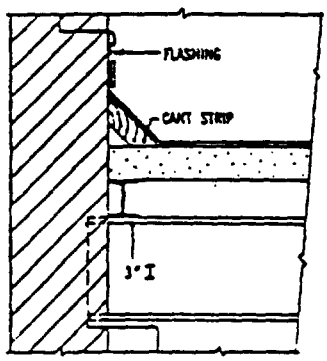
EAVE SECTION
WALL BEARING



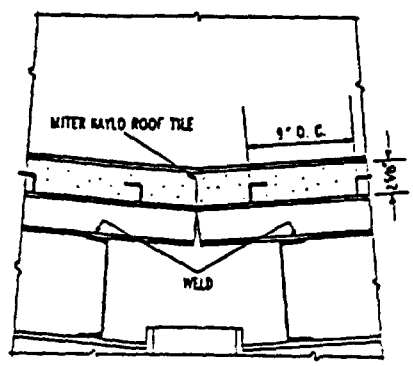
RIDGE SECTION



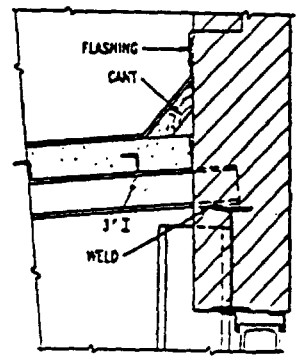
EAVE SECTION
SKELETON FRAME



PARAPET SECTION
SUB PURLIN PARALLEL TO WALL



VALLEY SECTION



PARAPET SECTION
SUB PURLIN PERPENDICULAR TO WALL

SCALE-3/4"=1'-0"

TYPICAL DETAILS

SEE REVERSE SIDE FOR SPECIFICATIONS AND DATA

KAYLO INSULATING ROOF TILE SPECIFICATIONS

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including bent studs, grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. Bent Studs

Bent Studs shall be 1½" x 1½" N.T. Bent O.L.E. Studs. (Not threaded; outside loaded end). Each stud shall have a suitable ferrule. Studs and ferrules shall be as manufactured by Nelson Stud Welding Corp., or approved equal.

2. Kaylo Roof Tile

Roof tile shall be precast and reinforced Kaylo Roof Tile, 2⅝ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

3. Grout

Grout for end joints of tile shall be composed of the following materials, measured by volume:

	Proportions Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gal.

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

4. Curbs

Kaylo Insulating Roof Tile 2⅝ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. Structural Framework

Structural Purlins shall be furnished and installed by others. They shall be accurately spaced 3'-0½" on centers to receive Kaylo Roof Tile.

2. Bent Studs

Bent Studs shall be securely welded to the top chord of purlins by the Nelson Gun Stud Welder or other approved method. They shall be spaced 9" o.c. and lined up accurately on each purlin.

3. Kaylo Roof Tile

Kaylo Roof Tile shall be spaced on purlins to provide an end bearing of at least ½ inch, with that side up which is market "top". Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc., and grout in place.

Where necessary to cut standard pieces, any hand or power saw which will cut the wire mesh is suitable.

4. Grout

Joints at ends of tile, at ridges and hips, and where shown on the drawing shall be filled with grout mixed as specified. The grout shall completely fill the joints so that the bent studs are entirely encased in grout to provide anchorage against uplift pressure.

Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

5. Saddles

Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per hundred square feet of roof.

DESIGN DATA FOR KAYLO ROOF TILE

PHYSICAL CHARACTERISTICS

Size	2⅝" x 18" x 36"
Weight (23 lb. tile) Approx.	5 lb. per sq. ft.
Density, approx.	20½ lb. per cu. ft.
Reinforcing	3"x3"x10 ga. galv. welded wire mesh
Specific heat	0.22 Btu per lb. per °F.
Av. modulus of rupture	175 lb. per sq. inch
Av. crushing strength	500 lb. per sq. inch
Av. mod. of elasticity	160,000 lb. per sq. inch
Light reflection	approx. 80%

OVER-ALL COEF. OF HEAT TRANS.

Bare tile	0.20
Tile + built-up roofing	0.19
Tile + 1½" insulation* + built-up roofing	0.11
Tile + 2" insulation + built-up roofing	0.10

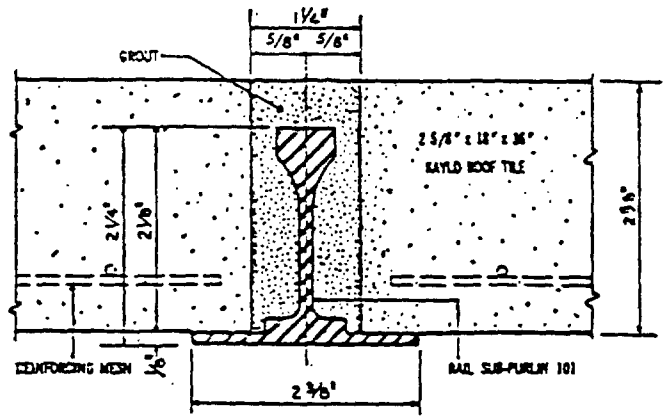
*11 lb. density Kaylo Insulation.

"U" BTU/SQ. FT./HOUR/°F.

FOR TRUSS SPANS, SEE TRUSS MFR'S SPECIFICATIONS

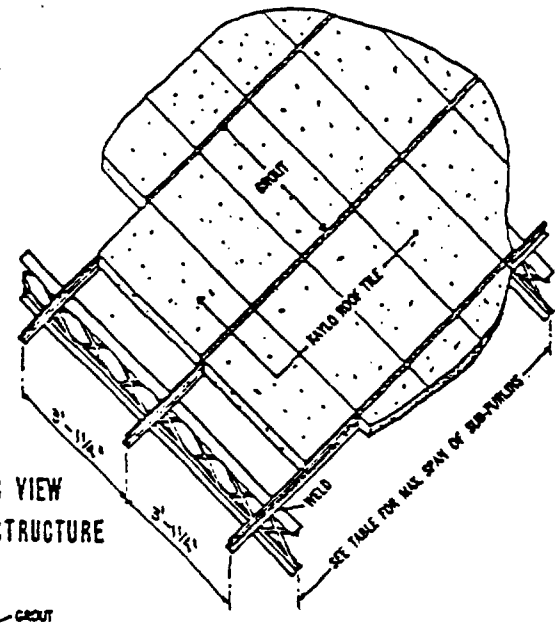
Bulletin R-1:2
Issued Sept. 15, 1948

KAYLO ROOF TILE DETAILS WITH RAIL SUB-PURLIN No. 101

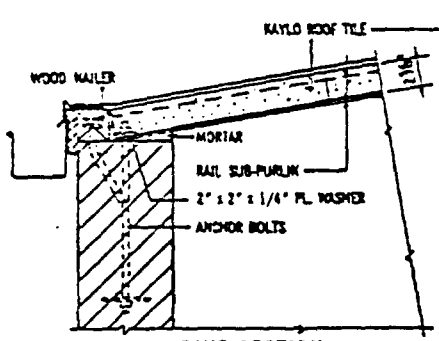


SECTION THROUGH JOINT

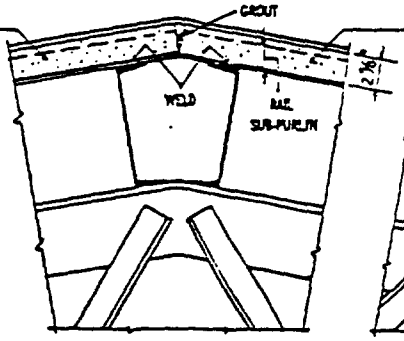
HALF SIZE



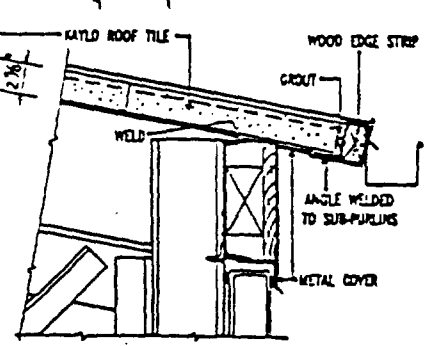
ISOMETRIC VIEW
OF ROOF STRUCTURE



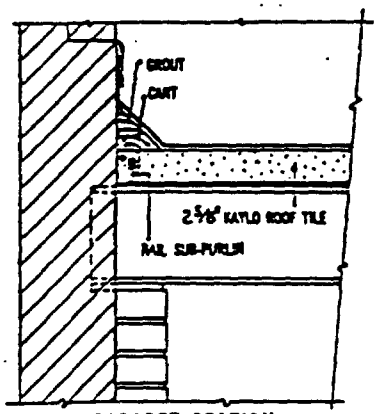
EAVE SECTION
WALL BEARING



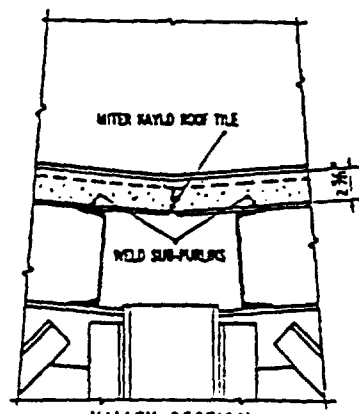
RIDGE SECTION



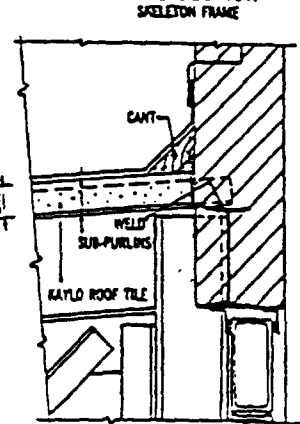
EAVE SECTION
SKELETON FRAME



PARAPET SECTION
SUB-PURLIN PARALLEL TO WALL



VALLEY SECTION



PARAPET SECTION
SUB-PURLIN PERPENDICULAR TO WALL

SCALE 3 4" = 1'0"

SEE REVERSE SIDE FOR SPECIFICATIONS AND DATA

KAYLO INSULATING ROOF TILE SPECIFICATIONS

NOTE: The general conditions of the contract are hereby made, by reference, a part of this specification.

SCOPE

This work consists of furnishing all labor and materials necessary for the installation of Kaylo Roof Tile, including steel sub-purlins, grout and curbs as shown on the drawings, or as specified herein, or both.

MATERIALS

1. **Sub-purlins.** Steel sub-purlins shall be American Structural Products rail sections No. 101.

Before leaving the shop, all steel work shall be thoroughly cleaned of all loose rust, mill scale and foreign matter and given one coat of approved metal protection applied thoroughly and evenly.

2. **Kaylo Roof Tile.** Roof tile shall be precast and reinforced Kaylo Roof Tile, 2½ inches thick by 18 inches wide by 36 inches long as made by American Structural Products Company.

3. **Anchors.** Anchors are not required with American Structural Products sub-purlins No. 101.

4. **Grout.** Grout for end joints of tile shall be composed of the following materials, measured by volume:

	PROPORTIONS	
	Ratio	Batch Volume
Gauging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7½ gallons

Consistency of grout shall be such that it can be poured, but not so thin that the vermiculite will float. Add water to provide proper consistency. Stir thoroughly to remove all lumps. Dry materials may be mixed in large quantities as desired, but water should be added only to small batches which can be used immediately.

5. **Curbs.** Kaylo Insulating Roof Tile 2½ inches thick by 18 inches wide by 36 inches long shall be used for curbs wherever shown on plans. Tiles shall be cut on job to height required.

INSTALLATION

1. **Sub-purlins.** To receive Kaylo Roof Tile, American Structural Products rail sub-purlins No. 101 shall be accurately spaced 3'-1¼" on centers.

Sub-purlins shall be welded to each support with one fillet weld, ¾ inch long placed on alternate sides of sub-purlins. Where joints of sub-purlins do not occur over supports, their ends shall be welded together. Where ends of sub-purlins bear on masonry, they shall be securely anchored to the masonry as shown on the drawings or with one bolt at each sub-purlin.

2. **Kaylo Roof Tile.** Kaylo Roof Tile shall be spaced evenly on sub-purlins to provide a minimum end bearing of ½ inch, with that side up which is marked "top." Tile shall be butted tightly together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc. and grout in place.

Where necessary to cut standard pieces for fitting, any hand or power saw which will cut the wire mesh is suitable.

3. **Grout.** Joints at ends of tile over sub-purlins, and at ridges and hips, shall be filled with grout mixed as specified. Where sub-purlin No. 101 is used the stem of the sub-purlin shall be completely surrounded with grout to provide a key anchorage against uplift pressure.

Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

4. **Saddles.** Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per one hundred square feet of roof.

DESIGN DATA FOR KAYLO ROOF DECKS

KAYLO ROOF TILE

Size	2½" x 18" x 36"
Weight (23 lb. tile) approx.	5 lb. per sq. ft.
Density, approx.	20.5 lb. per cu. ft.
Reinforcing	3"x3"x10 ga. galv. welded wire mesh
Specific heat	0.22 Btu per lb. per °F.
Av. modulus of rupture	175 lb. per sq. inch
Av. crushing strength	500 lb. per sq. inch
Av. mod. of elasticity	160,000 lb. per sq. inch
Light reflection	approx. 80%

OVER-ALL COEFFICIENT OF HEAT TRANSMISSION

"U" BTU/SQ.FT./HOUR/°F

Bare tile	0.20
Tile — built-up roofing	0.19
Tile — 1½" insulation* — built-up roofing	0.11
Tile — 2" insulation — built-up roofing	0.10

*11 lb. density Kaylo Insulation.

RAIL SUB-PURLIN NO. 101

Size	Weight		Spacing	In-x In.⁴	Iy-y In.⁴	Sx-x In.³
	Lb./L.F.	Lb./S.F. of Roof				
2¼"x2½"	3.3	1.1	3'-1¼" On Centers	.694	.182	.522

ALLOWABLE SPANS FOR VARIOUS LOAD CONDITIONS

	Total Load (Per Sq. Ft.)	Span*		Deflection	
		f = 20,000	f = 18,000	f = 20,000	f = 18,000
Southern States & Pacific Slope	32 lb.	9'-6"	9'-0"	.454	.370
Central States	42 lb.	8'-4"	7'-10"	.358	.279
Rocky Mountains & N. E. States	49 lb.	7'-9"	7'-4"	.310	.248
Northwest States	57 lb.	7'-2"	6'-8"	.258	.208

*Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bending occurs, reduce span.

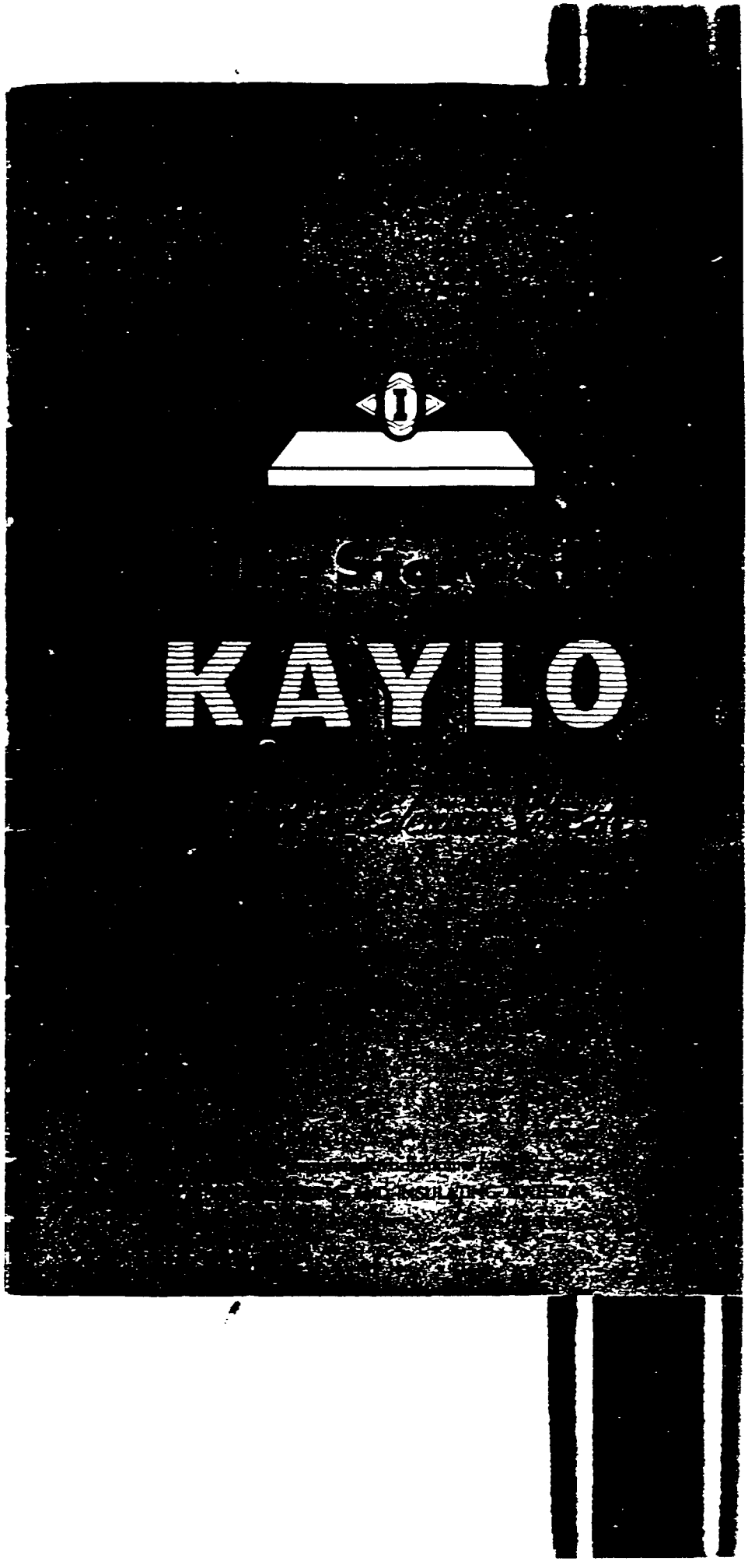
Assumed dead load, per square foot of roof:

Kaylo tile and sub-purlins	6.0 lb.
Built-up roofing (tar and gravel)	6.0 lb.
Total dead load	12.0 lb.

Assumed snow load on horizontal surface per square foot of roof:

Southern States and Pacific Slope (live load)	20 lb. per sq. ft.
Central States	30 lb. per sq. ft.
Rocky Mountains and N. E. States	37 lb. per sq. ft.
Northwest States	45 lb. per sq. ft.

$M = \frac{Wl}{}$


KAYLO

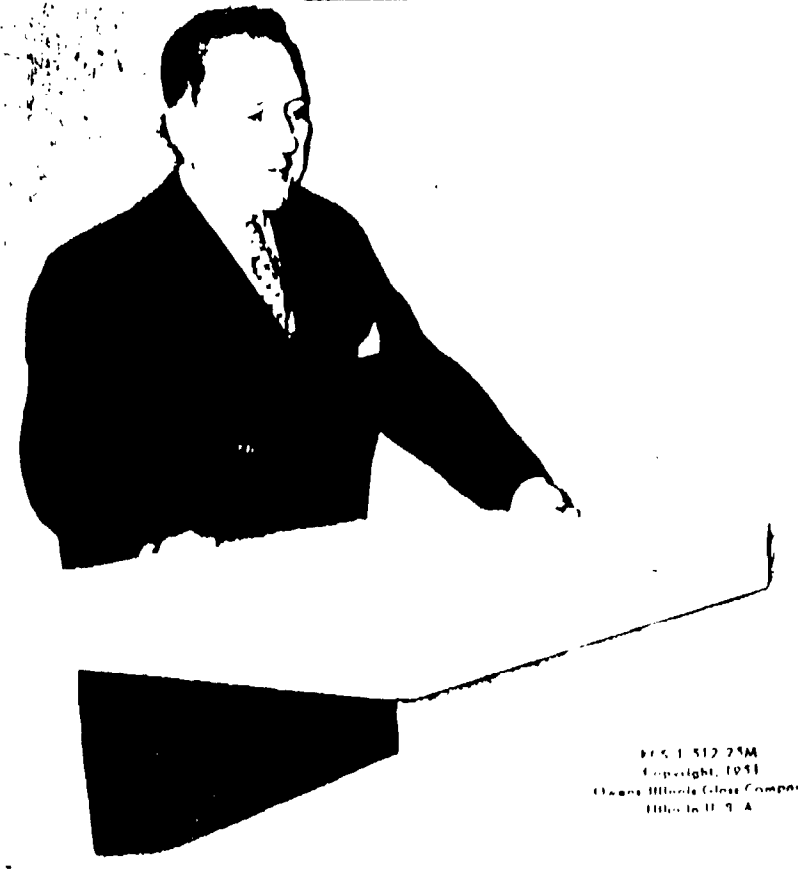
KAYLO*....

*Registered trade name for

A BETTER BUILDING AND INSULATING MATERIAL

...Pioneered by

OWENS-ILLINOIS
GLASS COMPANY
Toledo 1, Ohio



First in Calcium Silicate

A new material is taking its place alongside the "old stand bys" of construction and other industries—a material which combines the best properties of many others. It is a chemical compound of lime and sand (and small amounts of asbestos fibers) which the technically-minded call a "hydrous calcium silicate". Owens-Illinois introduced it to a limited market in 1943 and makes identification easier by using the trade name Kaylo for all their products made of this unique material.

The name "Kaylo" was taken from the symbol "k", meaning thermal conductivity (heat transfer) in engineering terminology, and "low", indicating that its thermal conductivity is low.

Not A Glass Product

Although Kaylo calcium silicate contains two of the raw materials which are used in making glass, it is not a glass product. Glass is made by fusion (melting together) of the raw materials. Calcium silicate is the result of a direct chemical reaction between lime and sand.

Unique Advantages for Variety of Uses

Lighter than wood, a better thermal insulator than gypsum, stronger than the common materials used for insulation and as incombustible as concrete, Kaylo material offers exciting possibilities for an almost unlimited number of uses. Application of Kaylo products all over the world has already established their superiority in a wide variety of uses. Others are being developed at this moment, both by Owens-Illinois and various manufacturers who make fabricated products. After reading this booklet, new uses may occur to you.

Kaylo calcium silicate and the products made from it will become increasingly important to you. This booklet tells you why.

WHAT KAYLO MATERIAL IS . . .

Courtesy Dr. Frank Kaylo Division
Owens-Illinois Glass Company

KAYLO CALCIUM SILICATE IS THE RESULT OF A CHEMICAL PROCESS

LIME

SAND

FLOW DIAGRAM

Kaylo Hydrous Calcium Silicate From Raw Material To Finished Product

LIME

SILICA SAND

ASBESTOS FIBERS

Inert Material

MIXING

MOLDING

HARDENING
Chemical Reaction

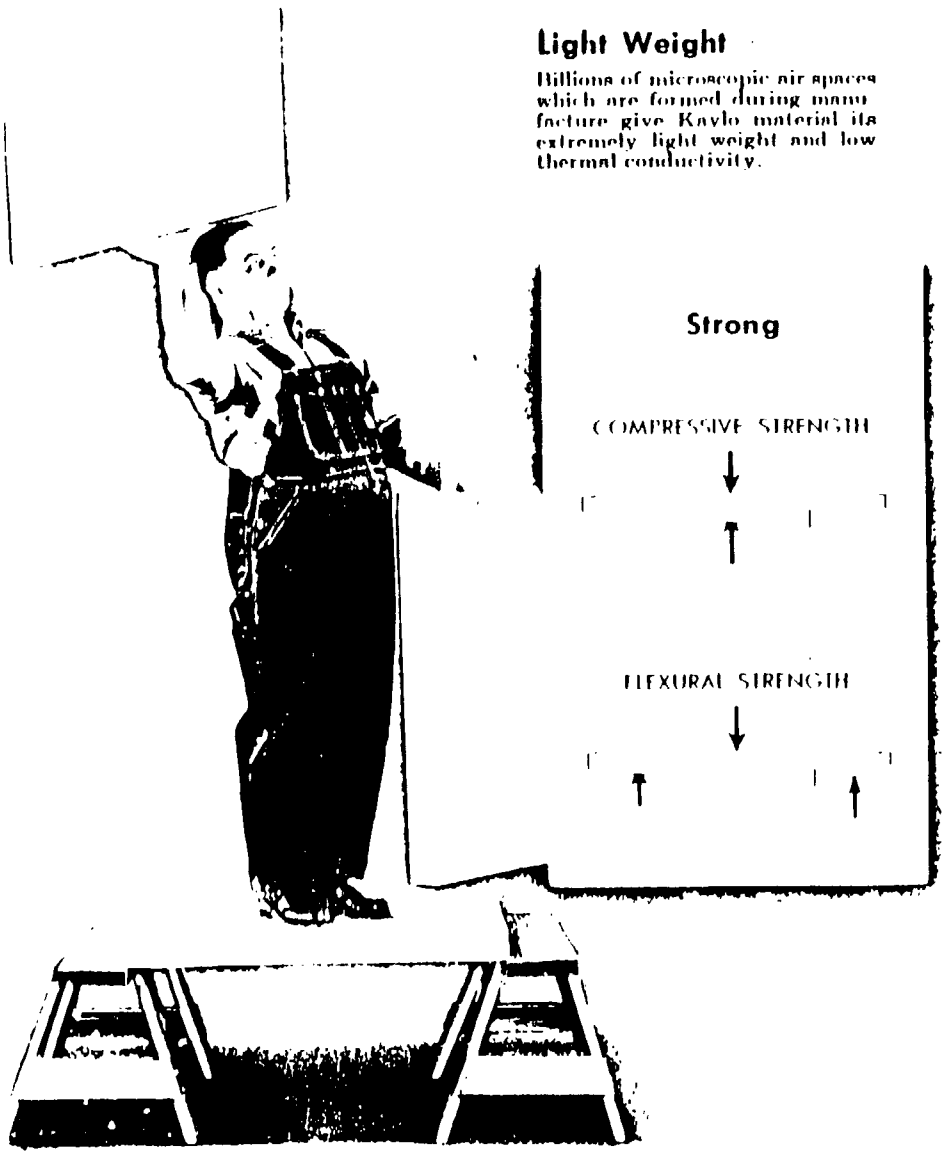
DRYING
Moisture Removed

FINISHING AND TRIMMING TO DIMENSIONS

Characteristics

Light Weight

Billions of microscopic air spaces which are formed during manufacture give Kaylo material its extremely light weight and low thermal conductivity.



Strong

Insoluble In Water

In tests, Kaylo material has been boiled continuously for 24 hours and longer. After drying, it regains strength and insulating efficiency. Even when saturated, Kaylo material retains about 85% of its strength.

Incombustible, Resistant to Heat Flow and to Temperature Change

Kaylo material has been tested at the Underwriters' Laboratories in Chicago and given the following rating, based on comparison with untreated Red Oak as 100:

Flame spread	0.0
Fuel contributed	negligible
Smoke produced	0.0

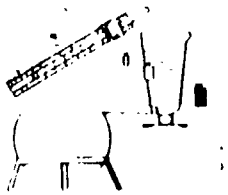
In another test, a section of Kaylo material is exposed to a flame temperature above 1600 F. The surface unexposed to flame remains cool enough to touch with the bare hand for an indefinite period.

Thirty seconds after the piece has been removed from the flame, the surface which has been exposed to the flame is cool enough to be touched. This also illustrates its low thermal diffusivity. In other words, it prevents the heat away faster from the surface than heat can come to the surface of the Kaylo calcium silicate.

Other Properties

Kaylo calcium silicate is exceptional in dimensional stability. It does not warp. It is rotproof and vermin proof. It does not support mold. It is a white color provide high light reflectivity. It is compatible with standard adhesives and may be handled in nearly any other type of construction material.

Research and Development



In *1948*, Owens-Illinois first turned its attention to this new field. By *1950* it was carrying on a comprehensive program of research and development on hydrous calcium silicates, beginning with a study of their fundamental chemistry.

Many other companies and groups had experimented with material of this type. Work had been done in Germany in the early 1940's. Several independent research organizations and manufacturing companies in the United States and Canada had attempted to develop commercial hydrous calcium silicates during this period.

Until the physicists, chemists and engineers of Owens-Illinois studied the chemical structures of the component materials and learned the secrets of their reactions on each other, however, no one had produced a stable, uniform product with the advantages of Kaylo calcium silicate. The formulations and methods Owens-Illinois uses today were developed by themselves, independently of any other groups.

Even though Kaylo calcium silicate is now an accepted commercial material, Owens-Illinois continues an extensive development program. Research projects include studies of basic chemistry to improve the physical properties of the material, modifications of the product, forming, metallization methods and manufacturing techniques.

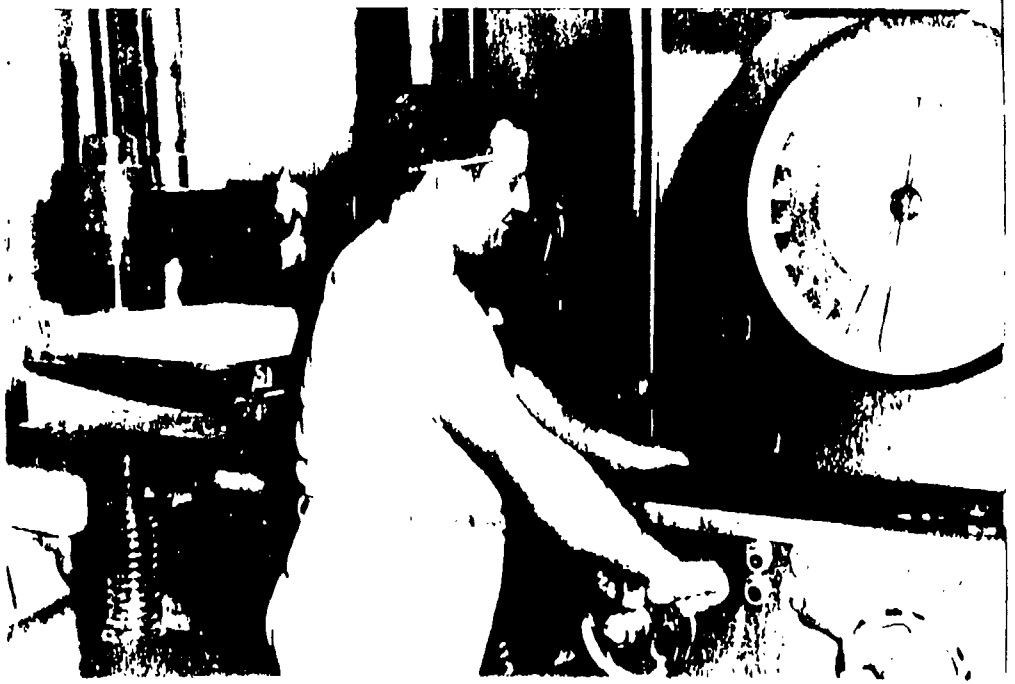
Entirely new fireproofing and insulating products are being developed today in Owens-Illinois laboratories.

FIRST SUCCESSFUL COMMERCIAL MANUFACTURER

In *1943*, Owens-Illinois began manufacturing limited quantities of calcium silicate. Material then being made at the plant at Berlin, New Jersey was used by government agencies in the form of heat insulating block and pipe covering.

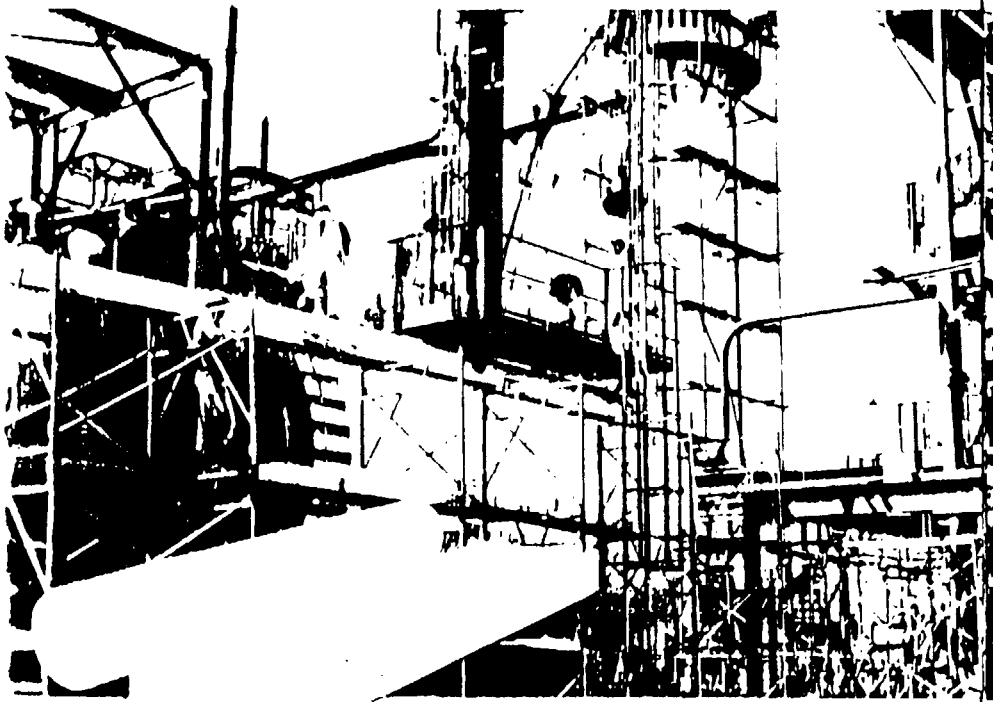
A few years later, construction began on a quarter-mile long manufacturing plant at Sayreville, New Jersey, and actual commercial manufacturing of Kaylo products started there in March, *1948*. Since that time the capacity of the Berlin plant has also been expanded several times.

Quality control plays an important part throughout the manufacture of Kaylo calcium silicate—from raw materials to finished products. Here a flexural test is being made on a block of structural density Kaylo material.



Two Densities

The term *density*, as used here, means the weight of one cubic foot of Kaylo material. By varying formulations, the density of Kaylo material can be changed to obtain the features and characteristics most desired in the end product. During manufacture, the density is controlled within narrow limits—well within plus or minus one pound per cubic foot. Two densities, 11 and 20 pounds per cubic foot, have proved to be the most useful.

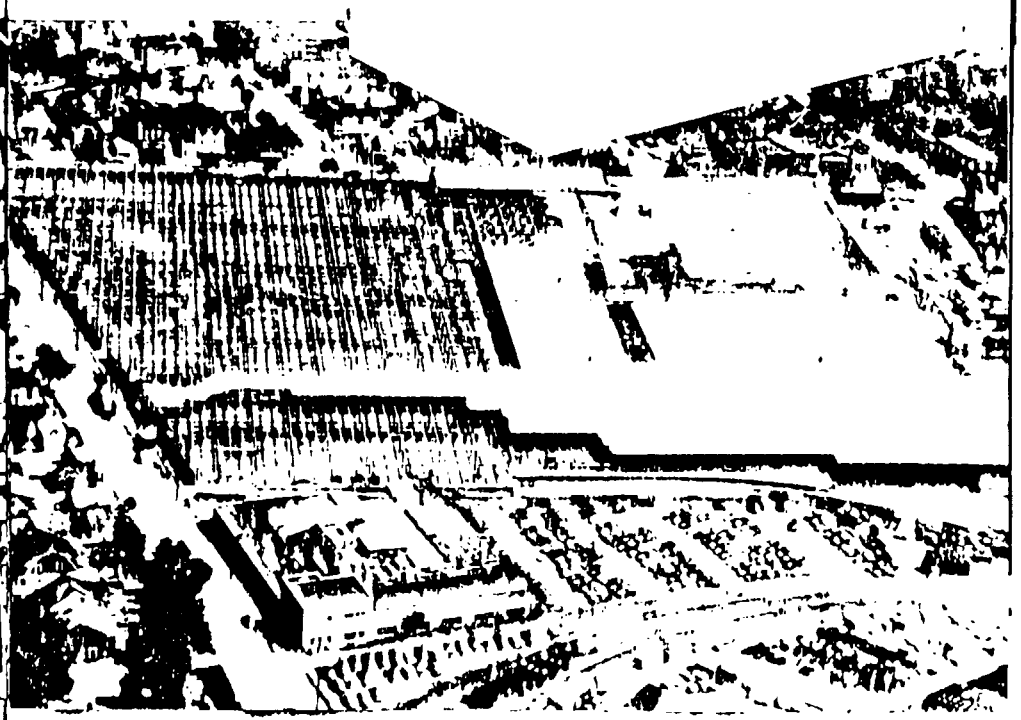


Thermal Density

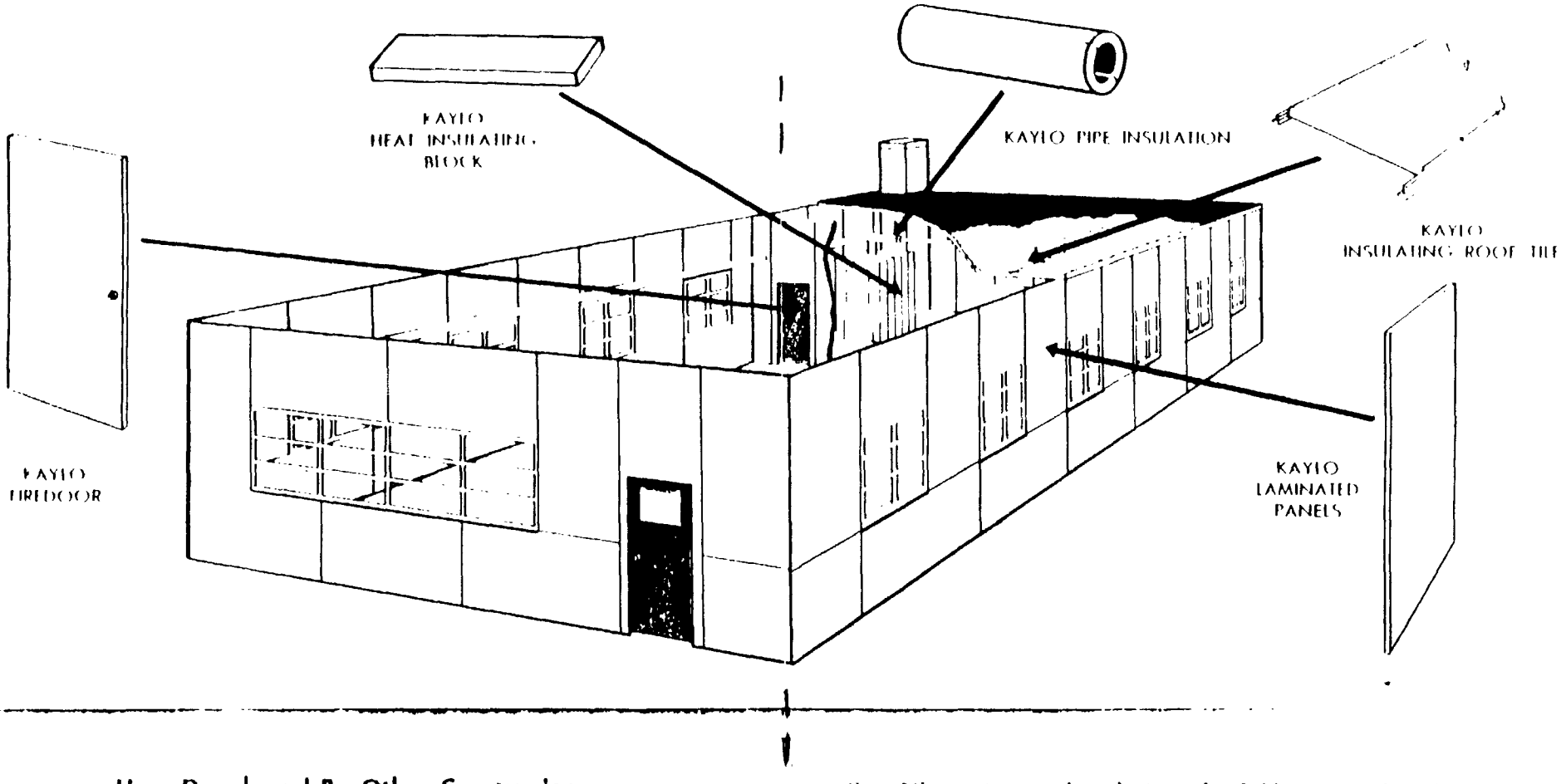
Thermal density (11 pounds per cubic foot) is used where heat insulating value is the primary need and mechanical strength secondary but still important. Thermal Kaylo density material is approximately 90 per cent air by volume, but the air spaces are too small to be seen.

Structural Density

Structural density (20 pounds per cubic foot) is used where substantial strength and fireproofing needs are important as well as heat insulation. While heavier than thermal density, it is extremely light when compared to other structural materials used for the same purpose. Structural density Kaylo material is approximately 80 per cent air by volume.



KAYLO CALCIUM SILICATE PRODUCTS BY OWENS-ILLINOIS



Uses Developed By Other Companies

Kaylo calcium silicate is used not only by Owens-Illinois for products which they market under the brand name of Kaylo, but also by other manufacturers who use it as a part of fabricated products marketed under their own names. For example, other manufacturers are using Kaylo calcium silicate as a core material for prefabricated wall sections, firedoors, ventilating units and for absorption units in humidifiers.

One of the most unusual products made of this material by other manufacturers is a tapper for blast furnaces. Structural density Kaylo material is molded into bullet like units. They carry a directed charge of explosives which open holes in furnaces to release molten metal. The charge in the tapper is detonated electrically by remote control, and if the electrical system fails, the thermal characteristics of the Kaylo material force the tapper to ignite automatically in a predetermined time by the heat of the furnace. This improvement over former hand methods of tapping furnaces provides greater safety for workmen.

KAYLO *Heat Insulation*

For Temperatures Up to 1200° F.

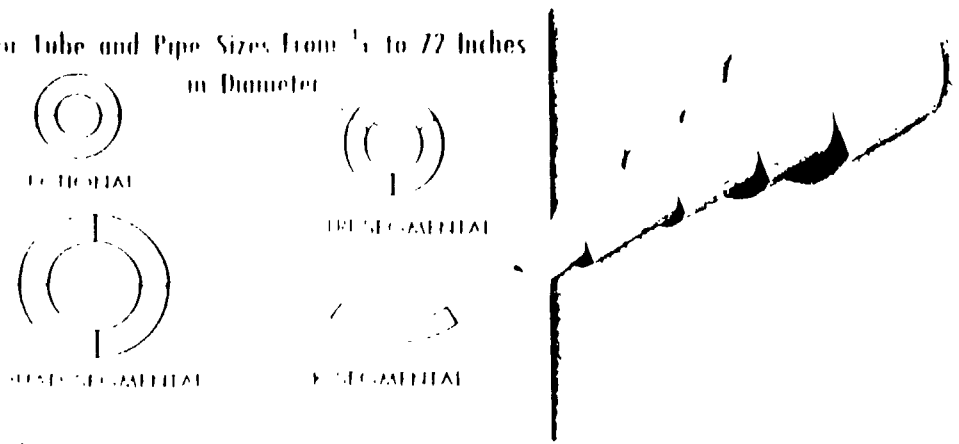
Kaylo Heat Insulation, with its remarkable combination of advantages, has gained recognition as the first major advancement in high temperature insulation. It is rapidly replacing other materials long used in this field.

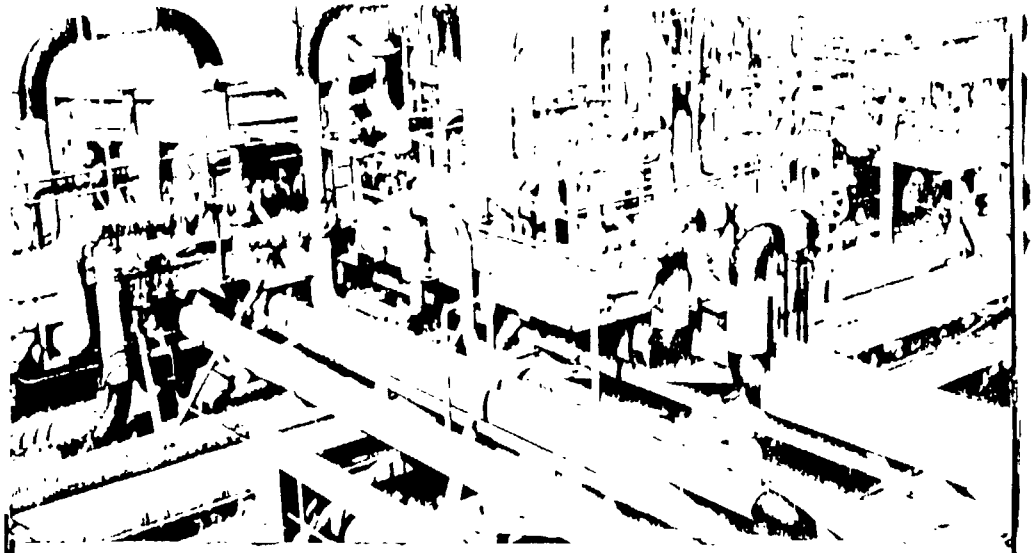
Kaylo Heat Insulation is of thermal density (11 pounds per cubic foot) and has a high effective temperature limit—1200°F. The extremely low thermal conductivity of Kaylo material assures high insulating efficiency throughout its entire temperature range.

Kaylo Heat Insulation is available in two forms: Kaylo Pipe Insulation and Kaylo Heat Insulating Block. Both have exceptionally good dimensional stability. Both are insoluble in water, incombustible, lightweight and strong . . . easy to handle and apply. Cutting and fitting is done with standard tools.

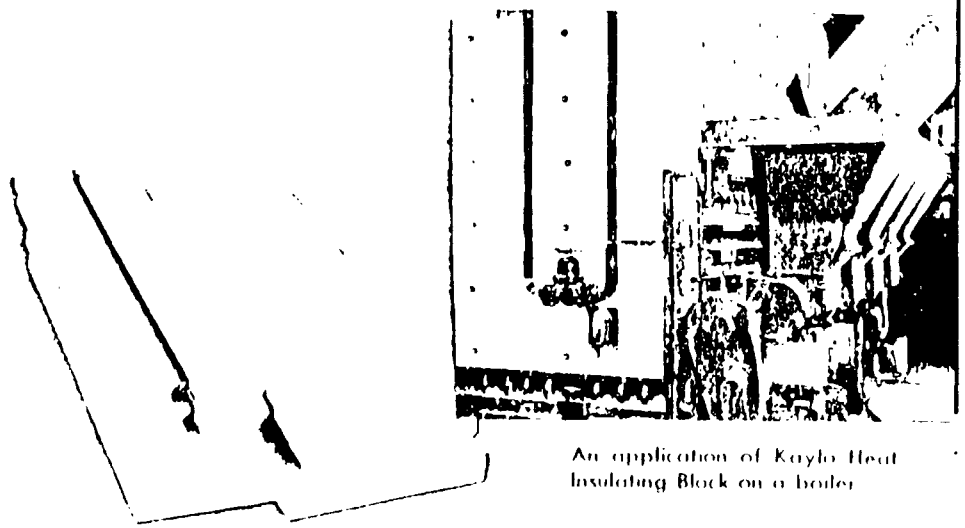
Simplified Dimensional Standards

Kaylo Pipe Insulation is produced in what is known as Simplified Dimensional Standards for tube and pipe sizes from ¼ in. to 72 in. in diameter. With this system the outside diameter of each piece of pipe covering is the same as the diameter of a standard pipe. This allows one piece of pipe covering to fit over another for snug nesting, when necessary.





An application of Kaylo Pipe Insulation in an oil refinery. Standard weather-proofing wrappings have been applied.

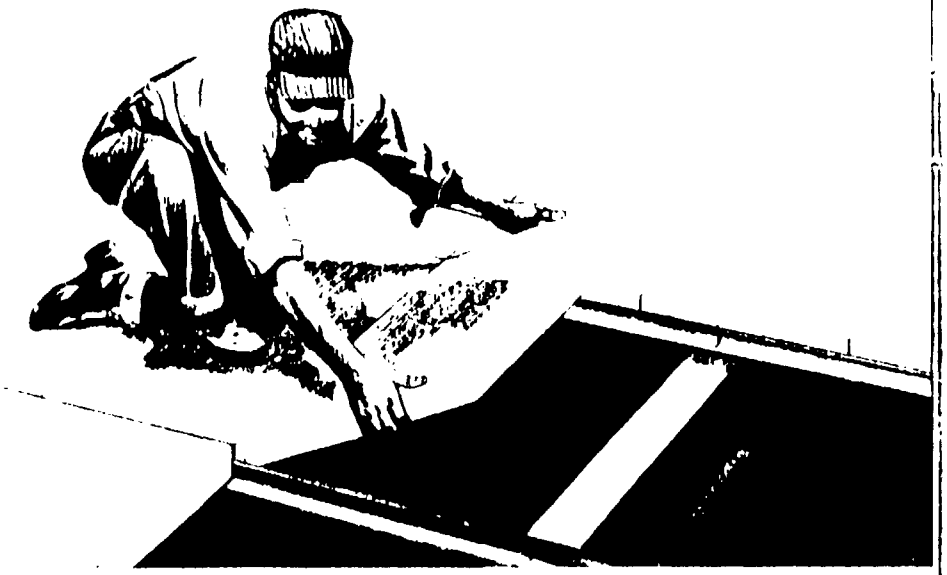


An application of Kaylo Heat Insulating Block on a boiler

Kaylo Heat Insulating Block

For insulating boilers or other equipment with surfaces that are flat or nearly flat, (diameters larger than 60 ft.) Kaylo Heat Insulating Block is available in units for single layer application. It is made in thicknesses from 1 in. to 6 in. and in all standard sizes up to 18 in. x 36 in. For vessels less than 60 ft. in diameter it is made in curved block 18 in. wide.

KAYLO *Insulating Roof Tile*



For A Better, Longer-Lasting Roof Deck

Kaylo Insulating Roof Tile of structural density (20 pounds per cubic foot) presents an outstanding advancement in roof design and construction. For flat or pitched roofs—for almost all kinds of buildings, Kaylo Roof Tile offers a combination of advantages never before obtainable in one material.

Fire Protection

Kaylo Insulating Roof Tile is incombustible. The tile themselves will withstand building fire temperatures up to three hours and are still strong enough to be walked on.

Insulating Value

Since Kaylo Roof Tile provides insulating value equal to that of an inch and one half of standard insulating board, no additional insulation is needed for usual installations.

Structural Strength

The structural strength of this steel mesh reinforced Kaylo Roof Tile is more than adequate for typical roof loads.

Inorganic Composition

Kaylo Insulating Roof Tile, made of inorganic calcium silicate, is rotproof, verminproof and insoluble in water.

Light Weight

Substantial savings are effected because the lightweight tile (only 5 pounds per square foot) permits the use of lighter and more economical supporting structural members and foundations.

Simple Fast Construction

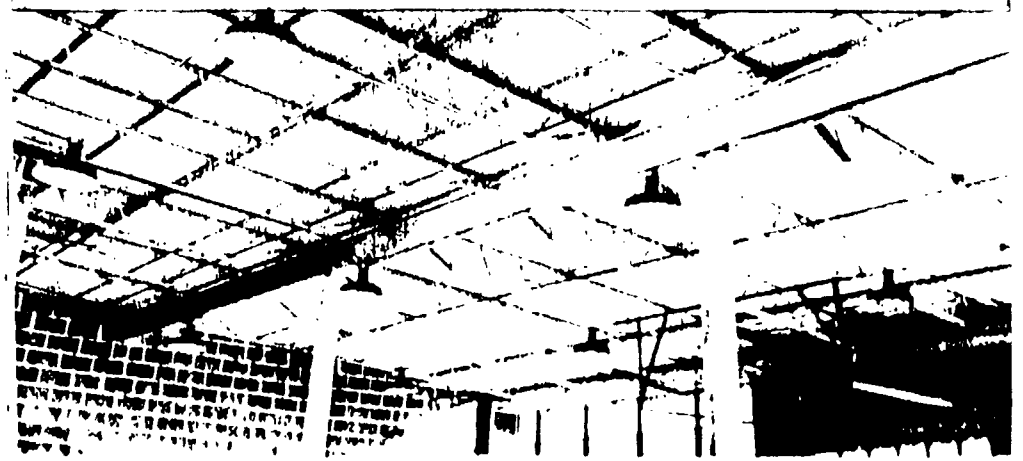
Kaylo Insulating Roof Tile are laid quickly and easily on steel sub purlins or standard structural shapes, or may be nailed to wood joists.

When Owens-Illinois sub-purlins are used, a Kaylo roof deck is constructed in only three steps—erecting the sub purlins, laying the tile and grouting the end joints. Then the deck is ready for covering by conventional roofing materials such as built-up roofing, asphalt, asbestos slate or terra cotta tile shingles.

No Special Tools Needed

Kaylo Insulating Roof Tile can be fitted to odd-sized spaces without special tools. Any saw which will cut the reinforcing wire mesh is suitable. Tile can be readily chipped or gouged to fit irregular surfaces. One man easily handles the 23-pound tile.

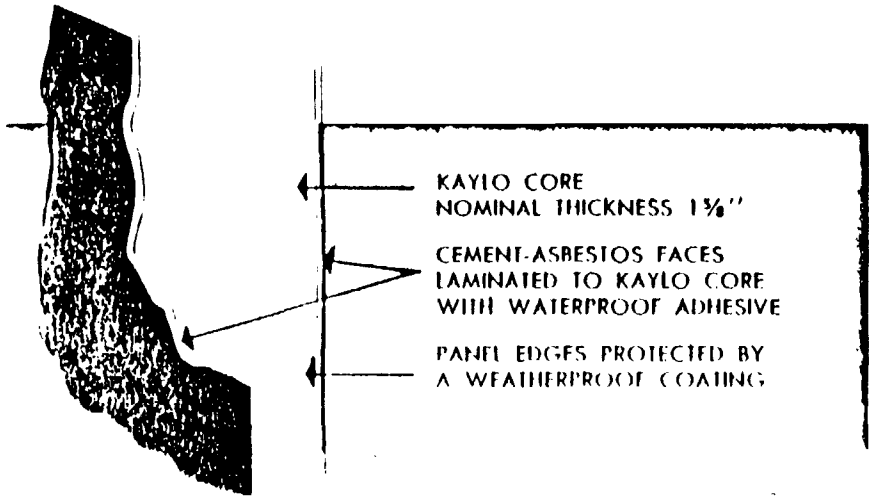
The smooth under-surface of Kaylo Insulating Roof Tile has a light reflection factor of approximately 80 per cent. Note the lightweight supporting structure made possible by a Kaylo roof deck.



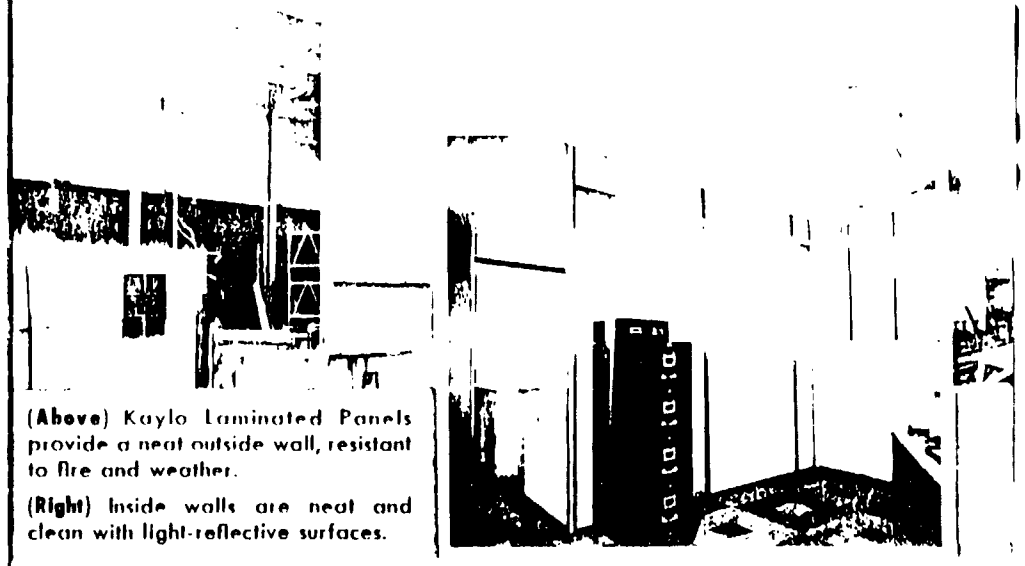
KAYLO *Laminated Panels*

Kaylo material of structural density (20 pounds per cubic foot) is used as the core in panels faced with wood veneer, cement asbestos or any of a variety of metals. The noncombustible Kaylo core is securely bonded to facings with a waterproof adhesive. This sandwich type of construction and the strong Kaylo core give Kaylo Laminated Panels exceedingly high strength, dimensional stability and resistance to impact. Kaylo cores are being used in a number of laminated products now on the market, in which fire resistance is the prime consideration.

Cement-Asbestos Board Facing



Kaylo Laminated Panels with cement asbestos facings provide complete curtain wall or nonload bearing partition sections which require no finishing on either side, no painting, furring, plastering, caulking or insulation. While not required, paint may be applied to the panels by conventional means.



(Above) Kaylo Laminated Panels provide a neat outside wall, resistant to fire and weather.

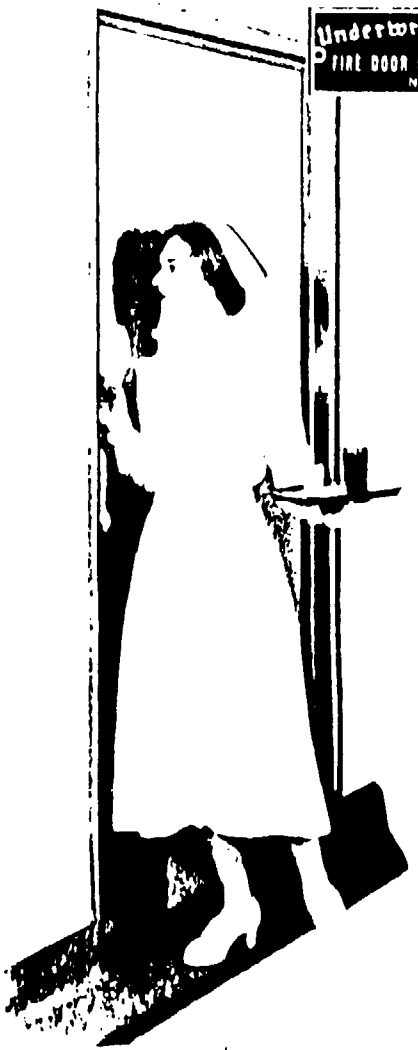
(Right) Inside walls are neat and clean with light-reflective surfaces.

Although nominally two inches thick, Kaylo Laminated Panels with cement asbestos facing have better insulating value than 16 inches of solid concrete. Installed with proper joint systems, the Kaylo Laminated Panels meet A.S.T.M. one hour fire standards. They have remarkable resistance to deterioration from water or exposure to the elements, even in extreme weather cycles.

Easy to Erect

Each standard 4 x 8 foot panel with cement asbestos facings provides a complete wall section. 32 square feet in area, which weighs only about 300 pounds. Two men can erect one of these panels in a few minutes. A brick wall of the same area would require 416 individually laid bricks and weigh about 7,400 pounds.

KAYLO *Firedoors*



Kaylo Firedoors, with their incombustible core of Kaylo calcium silicate, carry an Underwriters' label. This means they have passed tests under conditions similar to actual fire conditions. Many other important advantages are combined in the Kaylo Firedoor.

Handsome Appearance—The wood veneer faced Kaylo Firedoor equals the richness of the most striking conventional wood doors. It offers rated fire protection, without sacrifice in beauty.

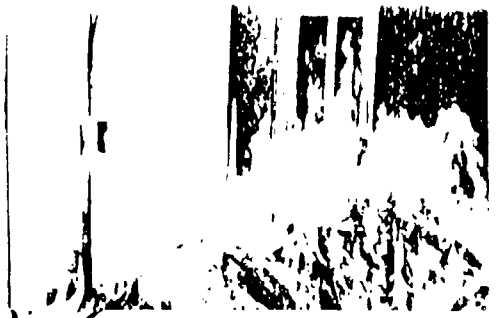
Insulating Value—Installed in an exterior opening with weather stripping, the Kaylo Firedoor insulates more effectively than a conventional door, *plus* a storm door.

Dimensional Stability—A Kaylo Firedoor does not warp, swell or shrink—even when subjected to extremes of heat or cold, dampness or dryness.

Light Weight Plus Strength—A standard 3'4"x7' Kaylo Firedoor weighs only 90 pounds, but can support an 8,000 pound distributed load with only one half inch deflection while loaded. After unloading it returns to its original position.

This label on doors means rated fire protection, safety and reduced insurance rates for building owners. It appears on every Kaylo Firedoor.

1 To test comparative fire resistance, a Kaylo Firedoor and conventional wood door, set side by side in a concrete block wall are exposed simultaneously to fire.



2 The fire is set in a wood pile soaked with fuel oil. This is an untouched photograph of the "hot side" after less than 10 minutes direct exposure to flame.

3 On the opposite side of the wall, flames lick through the conventional wood door. But the Kaylo Firedoor has completely checked the fire and most of the heat as well. Note the men holding their bare hands on the Kaylo Firedoor—snow on the sill—while fire rages.

KAYLO® *Building and Insulating Products*

Members of a Distinguished Family of

Quality Products

Owens Illinois has been best known as a manufacturer of glass containers, although through its various divisions and subsidiary companies it manufactures a diversity of products.

It was natural that Owens Illinois should pioneer in the development of hydrous calcium silicate. As a manufacturer of glass products for more than a century it has had long experience with the two principal raw materials used in calcium silicate—lime and sand. Among the developments of Owens Illinois are glass block which the company introduced in the early 1930's. Having thus entered the building material field, the company saw the great possibilities in the market and the need for a broader line. Hydrous calcium silicate, with its unique properties and great potentialities, was a logical development.

Owens Illinois success in calcium silicate, covering over a decade of research and several years of commercial manufacture, means better buildings and products for industry—and very likely for you.

KAYLO® ● BUILDING AND INSULATING PRODUCTS

INSULUX® ● STRUCTURAL GLASS BLOCK

Duraglas® ● CONTAINERS

O-I® ● CLOSURES AND PLASTIC PRODUCTS

K® ● LABORATORY AND SPECIAL GLASSWARE

Libbey Glass® ● TABLE GLASSWARE

HEMINGRAY® ● GLASS INSULATORS

● COATED BOARD ● FOLDING CARTONS

KIMBLE® ● ALL-GLASS TELEVISION BULBS

OWENS O-I ILLINOIS

GLASS COMPANY

Toledo 1, Ohio

With your help

Owens-Illinois Glass Company

makes and sells

Quality Products

Owens-Illinois Glass Company . . . . . *is proud of the quality of its products.*

We believe it takes quality to make quality.

We know the goods and services we

buy from others help us

maintain the high standards

on which we have established

sound customer relationships.

The fabled **"shoes and ships and sealing wax"** *is a small inventory compared to the amazing variety of goods and services required to run a business like ours.*

Among other things we buy in large quantities:

Abrasives
Accounting
Acetylene
Acids
Adhesives
Advertising
Alkali
Aluminum Sheet
Arsenic
Asbestos
Automobiles

Banking
Barium Carbonate
Bearings
Belting
Blue Prints
Boilers
Borax
Boxes
Brick
Bristles
Building Materials
Building Rentals
Burners

Calculating Machines
Caps
Castings
Ceramic Colors
Clocks
Coal
Cobalt
Construction
Conveyors
Corrugated Paper
Cranes
Cullet

Dies
Disinfectants
Displays
Dredging

Electric Lamps
Electric Power
Electrical Supplies
Enamels
Engineering
Engravings

Feldspar
Fence
Fire Extinguishers
Fire Insurance
Flat Glass
Fluorspar
Forms
Fuel Oil
Furniture

Gasoline
Gears
Gloves
Glass Fiber
Gummed Tape
Gypsum

Hardware
Hose

Insulation
Insurance

Laboratory Equipment
Lacquers
Lead
Lime
Limestone
Locks
Lubricating Oils
Lumber

Machinery
Marble
Meters
Molding Compounds
Molds
Mortar
Motors

Nails
Natural Gas

Office Equipment
Ovens
Oxygen

Paint
Paper
Patterns
Plastics
Potash
Petroleum Products
Plating
Plywood
Printing Inks
Printing Presses
Printing
Public Address Systems
Pulleys
Pumps

Quartz

Refractory Materials
Registers
Regulators
Rubber

Sand
Salt
Scales
Selenium
Sheet Metal
Silk Screen
Smelting
Soda Ash
Springs
Sprinklers
Starch
Steel
Sulphur

Telegraph
Telephone
Tin Plate
Tools
Tractors
Transformers
Transportation
Trucks
Typewriters

Van Lines

Warehousing
Waste Paper
Watches
Water
Welding
Wire

Many of our suppliers are our customers, too. **We sell them....**

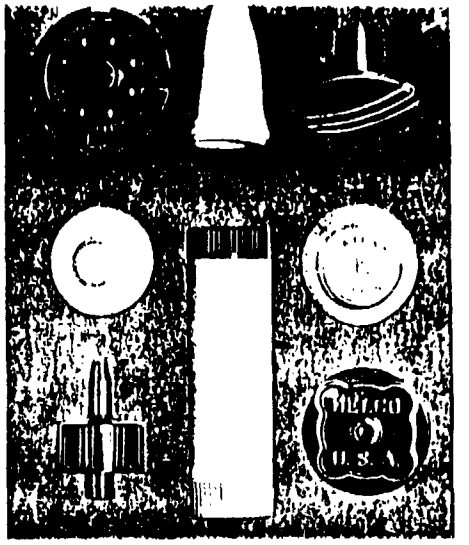
glass containers • closures

Every manufacturer or processor who makes a product which requires packaging, should be acquainted with the many advantages which are offered by Duraglas containers and closures made by Owens-Illinois.

If you now are using packages made of some other material, Owens-Illinois research staffs may be able to demonstrate that Duraglas containers and closures would do a better packaging job for you. You owe it to yourself to let our packaging research people look into your problems.

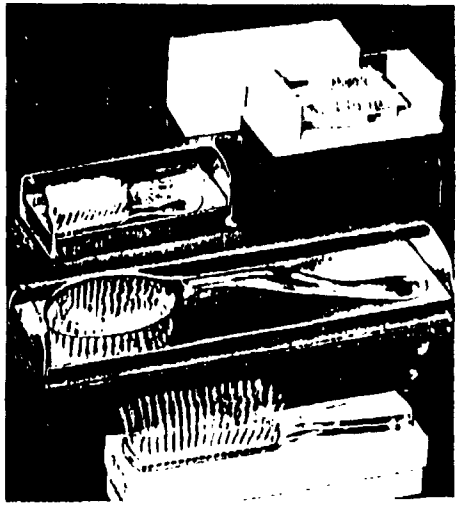
plastic products

The fabrication of plastics into many useful products is a major enterprise at Owens-Illinois. In addition to plastic closures which are a necessary part of our packaging business, we stand ready to supply custom made plastic products for many other uses.



brushes

Owens Brush Company, a subsidiary of Owens-Illinois, manufactures and distributes a complete line of personal brushes, such as tooth brushes, hair brushes, nail and hand brushes, eyebrow and mascara brushes and clothes brushes. Both natural bristle and nylon are used. In Owens brushes each bristle knot is anchored in the head of the brush.

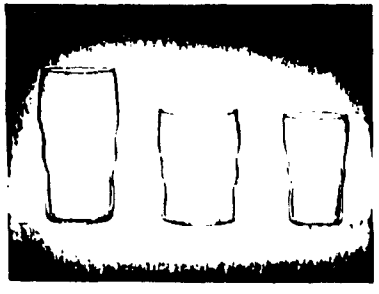


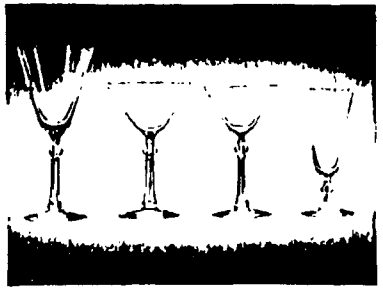
tableware

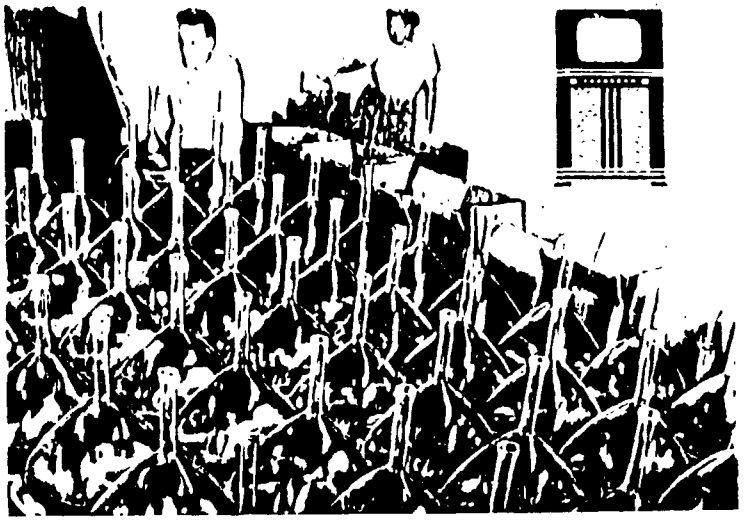
Every manufacturing plant which has food service facilities for its employees, needs the kind of fine Safedge glass drinking tumblers which are made by Owens-Illinois' Libbey Glass Division.

If your industry uses premiums as a part of your merchandising, Libbey would like to add your organization to its many satisfied customers.

Remember—over 34% of all women interviewed in a recent survey preferred glassware as premiums! And these glasses carry the famous Libbey guarantee: "A new glass if Safedge ever chips."





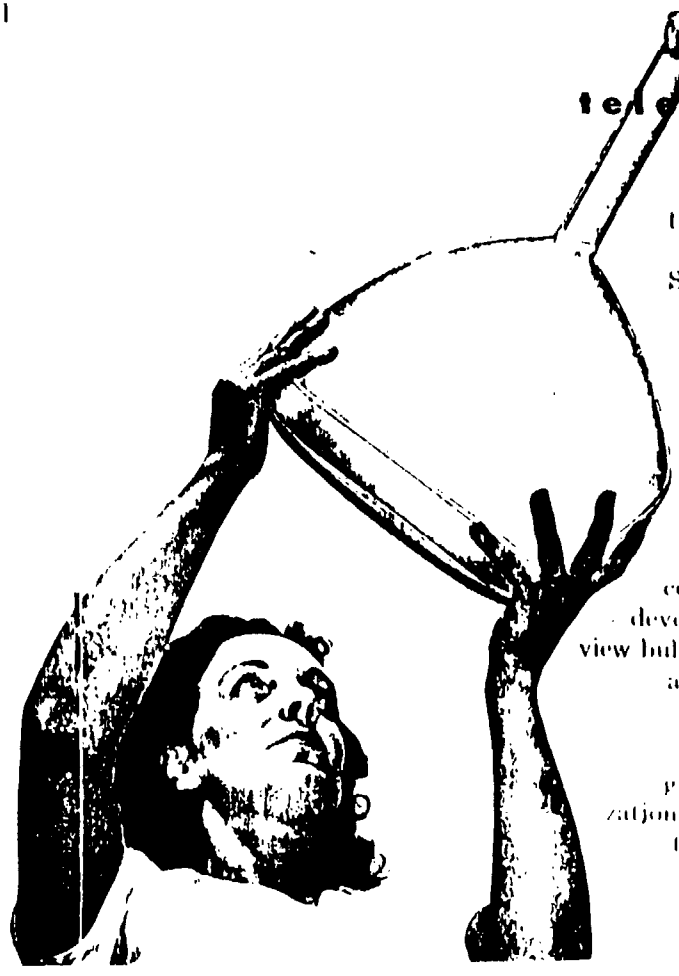


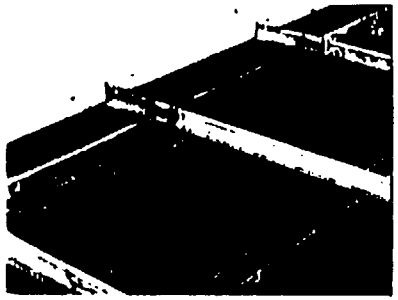
television bulbs

The mass production of television bulbs now is a major enterprise of the American Structural Products Company, an Owens-Illinois Glass Company subsidiary.

Owens-Illinois, a pioneer leader in television bulb production, has applied its vast background of research and experience to this fascinating new industry and has contributed greatly to its rapid development. The all glass direct view bulbs are made into tubes which are the very heart of television receiving sets.

Bulbs are turned out in great quantities by our organization. Many of the country's major tube manufacturers look to us as a source of supply for this all important item.





roof tile

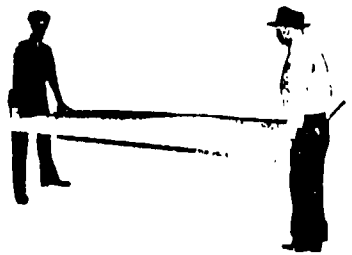
When building a commercial or industrial structure, cover it the modern and practical way with Kaylo Roof Tile. Here is a roof deck material that combines thermal insulation and structural strength. It's lightweight doesn't burn.

pipe insulation

Kaylo Pipe Insulation has been tested under severe service conditions. Years of research and development have combined in this product, light weight, high strength, moisture resistance, low conductivity, low heat capacity and thermal stability.

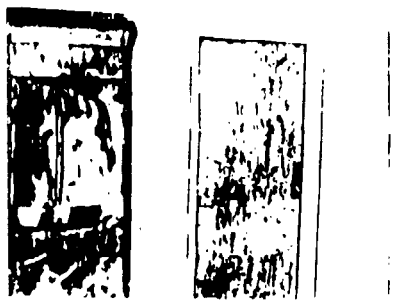
heat insulating block

Kaylo Heat Insulating Block has advantages almost every user of heat insulating block seeks—light weight, strength, high efficiency and a wide temperature range. It is less fragile and less subject to abrasion than most insulating blocks—less affected by moisture.



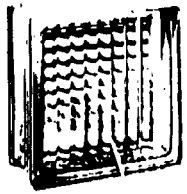
laminated panels

Kaylo Laminated Panels provide complete wall sections with interior and exterior finishes. A non-combustible core of Kaylo insulation and faces of various materials give high insulating value, light weight, fire resistance and stability.



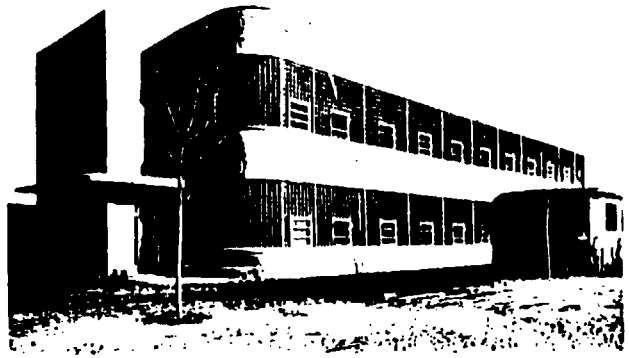
fireproof doors

Kaylo Firedoors, flush veneer with Kaylo cores, are the only wood-faced doors to carry the official Underwriters' Laboratories one-hour fire rating. They are beautiful, light and extremely stable. Wall panels are also available.



glass block

Insulux Glass Block is used in thousands of buildings because of its superior light transmitting characteristics, its high insulation value, low sound transmission, its capacity to reduce air infiltration and because of its permanence and low maintenance. Insulux Glass Block is ready to do a job for you just as it has for many others.

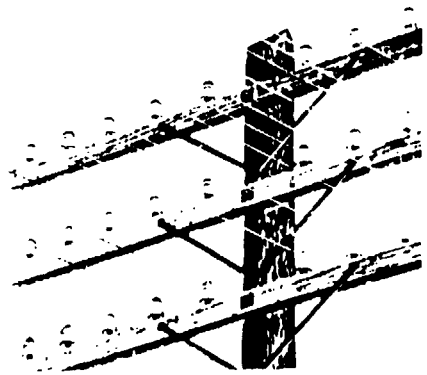


plywood products

Through the facilities of two subsidiary companies, Blair Veneer Company and Vermont Plywood, Inc., Owens-Illinois offers veneer and plywood panels for the furniture trade, piano sounding boards and a line of office desks and tables.

insulators

Accepted practice in present day usage indicates a high preference for Hemingray glass insulators in the field of communication, both telegraph and telephone. They also are used importantly for power lines. Cost aside, there are many reasons. Glass cannot absorb water, does not rot, corrode or lose its shape. Hemingray Insulators are made by Owens-Illinois.

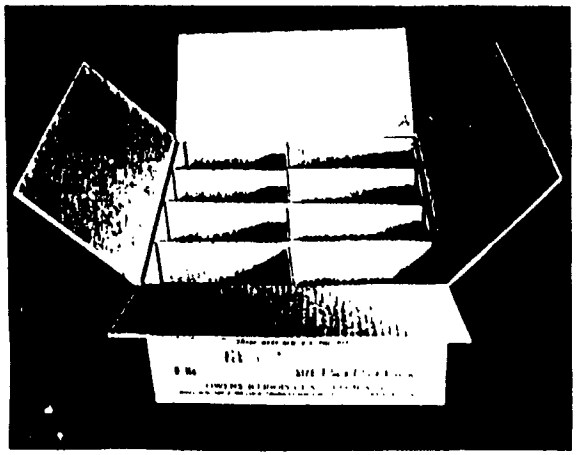


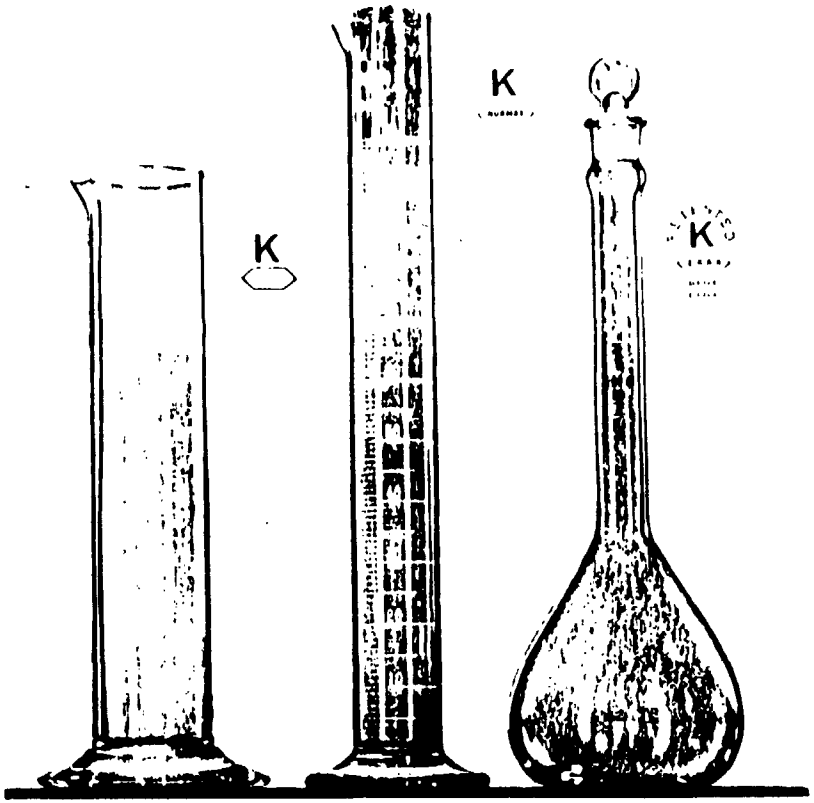
cartons

For more than 30 years Owens-Illinois has been making corrugated cartons and this operation now has expanded so that our company is an important factor in the corrugated carton industry.

More recently, Owens-Illinois has acquired American Coating Mills, one of the country's leading manufacturers of high quality folding cartons and clay coated folding box board. American Coating Mills now is operated as a division of Owens-Illinois.

Products of this division include all styles of multicolor folding cartons and folding carton displays produced by both the letter-press and offset processes; also clay-coated folding boxboard and all of the various grades of combination folding boxboard.





laboratory and scientific ware

Laboratory and Scientific Glassware made by the Kimble Glass Division of Owens-Illinois represents faithful adherence to a pledge made to American science and industry a quarter century ago, to design and produce laboratory and pharmaceutical glassware to equal or surpass the products of Europe.

In fulfilling this pledge, Kimble research and experience have developed features and practices of design, of material and of skilled workmanship which assure high quality, satisfactory performance and adaptation to exacting requirements.

Kimble Glass Division's knowledge and experience are constantly at your service, alert to guard the quality of Kimble tools for your laboratory jobs today and to anticipate your needs.

Perhaps you have
requirements which
we could supply.

We invite an inquiry.

OWENS-ILLINOIS GLASS COMPANY
Dept. SS, Box 1035
Toledo 1, Ohio

47, 50, 99

IN THE CIRCUIT COURT FOR BALTIMORE CITY

*
* ALL CT-1 CASES
* ALL CT-2 CASES
* ALL CT-4 CASES
* ALL CT-5 CASES
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DEFENDANT OWENS-ILLINOIS, INC.'S ANSWERS TO PLAINTIFFS' MASTER INTERROGATORIES TO ALL DEFENDANTS

To: All Defendants, to be answered individually and separately by each Defendant.

Plaintiffs, by their attorneys, John T. Enoch, John Amato, IV, and Goodman, Meagher & Enoch, request Defendants to answer the following Interrogatories. The Interrogatories are to be read and answered in accordance with the following instructions and definitions.

a. These Interrogatories are continuing in character and, in accordance with the Maryland Rules, you are required to supplement your answers promptly after you obtain further material information.

Furthermore, Owens-Illinois, Inc. objects to the instructions and definitions supplied by Plaintiffs with regard to these Interrogatories, on the basis that the definitions are overbroad, vague, and often inconsistent with the normal usage and meaning of such words, and the instructions are overbroad, burdensome and constitute an unreasonable expansion of the Interrogatories themselves. Owens-Illinois, Inc. therefore gives notice that it does not consider itself bound by the instructions and definitions propounded by Plaintiffs, and instead shall answer the Interrogatories in a manner consistent with a normal understanding of the language used in the answer and to the extent necessary to fairly and fully answer the Interrogatory.

PART I - GENERAL INTERROGATORIES

INTERROGATORY NO. 1: State the name, address and official capacity of each person who has supplied information used in answering these interrogatories and indicate for which interrogatory each such person is responsible.

RESPONSE NO. 1: This Defendant states that it has referred to the relevant business records of the Owens-Illinois Glass Company, which are still in the possession of Owens-Illinois, Inc., in connection with the preparation of answers to these Interrogatories unless otherwise indicated.

INTERROGATORY NO. 2: Identify each document that was examined, reviewed and/or used in answering each interrogatory, specify the interrogatory and identify the present custodian of each document.

RESPONSE NO. 2: This Defendant objects to this Interrogatory on the basis that it is overly broad and unduly burdensome, and calls for information which is immune from discovery under the attorney work product doctrine.

Without waiving above objections this Defendant states that it has referred to the relevant business records of the Owens-Illinois Glass Company, which are still in the possession of Owens-Illinois, Inc., in connection with the preparation of answers to these Interrogatories unless otherwise indicated.

INTERROGATORY NO. 3: State whether you are a corporation. If so, state: your corporate name; state of incorporation; date of incorporation; address of principal place of business; address(es) of any other place of business; whether, if you are a "foreign corporation" as defined in Maryland General Corporation Law Sec. 1-101(1), you are now or have ever been registered or qualified to do business in the State of Maryland; and the corporate name, state of incorporation and date of incorporation of any subsidiary, predecessor or affiliate corporation.

RESPONSE NO. 3: Owens-Illinois Glass Company was incorporated in the State of Ohio in 1929. Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965. The address of the principal place of business is One SeaGate, Toledo, Ohio 43666.

INTERROGATORY NO. 4: Identify all prior names by which you have existed.

RESPONSE NO. 4: Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965.

INTERROGATORY NO. 5: If you have divisions which have ever mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce asbestos products, identify each such division and state the names, addresses and job titles of each person who supervised each division, specifying the applicable time periods.

RESPONSE NO. 5: This Defendant does not now and has not in the past engaged in the mining, milling, sale, supply or distribution of asbestos of any type. This Defendant, likewise, does not now and has not in the past engaged in the business of manufacturing, selling, supplying or distributing asbestos-containing textile products, asbestos-containing thermal insulation products, or any asbestos-containing products, except asbestos-containing thermal insulation products in the form of pipe covering and block. Further, this Defendant does not now or has not in the past operated "contract units" or any other entity that installed or contracted to install asbestos-containing products.

Owens-Illinois Glass Company began limited pilot plant operations involving the production of asbestos-containing products in 1943. It began the manufacture of commercial quantities of asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

American Structural Products Company, a wholly owned subsidiary of Owens-Illinois Glass Company, engaged in the manufacture, sale and distribution of asbestos-containing products from about January, 1948 until about June, 1949 when it became the Kaylo Division of Owens-Illinois Glass Company. The Kaylo Division of this Defendant continued to manufacture such

products until about April 30, 1958 when it was purchased by Owens-Corning Fiberglas Corporation from this Defendant effective on that date. As of that time, this Defendant ceased the manufacture and sale of asbestos-containing products, and it has not engaged in any such business since that date.

INTERROGATORY NO. 6: Have you controlled, purchased or in any way acquired any interest in any corporation or business entity which mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce asbestos products?

RESPONSE NO. 6: No, however, Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965.

INTERROGATORY NO. 7: If your Answer to Interrogatory No. 6 is in the affirmative, identify and attach copies of all documents related thereto and state:

(a) The name(s), including prior name(s), and the business address(es) of any and all such corporation(s) or business entity(ies);

(b) The date(s) on which you first controlled, purchased or acquired said interest;

(c) The manner in which you acquired said interest, i.e., cash purchase, merger, consolidation, exchange or sale of assets, etcetera;

(d) The percentage of assets, ownership and/or control acquired by you;

(e) Whether the corporation(s) or business entity(ies) acquired by you continued to exist following the acquisition and, if not, the date on which its existence ceased;

(f) The nature of and/or amount of consideration paid by you for said interest;

(g) The terms and conditions of any contracts or agreements by and between you and such corporation(s) or business entity(ies), including, but not limited to, the terms and conditions relating to the transfer of liabilities for obligations of such corporation(s) or business entity(ies);

(h) Whether you continued the manufacture, sale and/or distribution of such corporation's or business entity's asbestos products and, if so, whether you used the same product name(s) in so doing; and

(i) Whether there was an identity of name, officers, directors, personnel, property, suppliers, distribution outlets and/or clients between you and such corporation(s) or business entity(ies);

RESPONSE NO. 7: Refer to Response No. 6.

INTERROGATORY NO. 8: If you have directly or indirectly mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce asbestos or asbestos-containing products, state as to each such product, indicating separately those products dealt with by you, your predecessor(s) in interest, your subsidiary(ies), and your affiliate(s), if any, the following:

(a) Brand name, trade-name, and/or trade-mark;

(b) The generic name or identity;

(c) Description, including size, shape, color and composition, i.e. solid, powder or other form;

(d) Chemical and physical composition, including, but not limited to, the percentage of asbestos by weight and volume;

(e) Type of asbestos, i.e. chrysotile, amosite, crocidolite, actinolite, anthophyllite, or tremolite, indicating the percentage of each such asbestos fiber by weight and volume;

(f) Intended marketable use; and

(g) Dates during which each asbestos product was mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce.

RESPONSE NO. 8: (a) Kaylo and Kaylo-20;

(b) This Defendant's asbestos-containing products were hydrous calcium silicate materials;

(c) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

(d) This Defendant ceased the manufacture, sale and distribution of its asbestos-containing products in 1958. Its investigation as to the composition of each such product, including the type of asbestos-contained therein (i.e., amosite or chrysotile) and the quantitative percentage of asbestos, is continuing, although this Defendant now believes that this Defendant's commercially produced asbestos-containing products were hydrous calcium silicates containing between 13% and approximately 20% asbestos. Chrysotile asbestos was the primary type apparently used. Amosite was used to a lesser extent.

(f) The asbestos-containing products manufactured by this Defendant were intended to be used for industrial high temperature thermal insulation such as pipe covering and block insulation, and to increase fireproofing and fire protection and for insulation through use as a roof deck or fireproof material or door core material.

(g) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

INTERROGATORY NO. 9: State whether you presently mine, manufacture, produce, fabricate, import, convert, compound, process, sell, merchandise, supply, distribute and/or otherwise place in the stream of commerce any asbestos product(s) listed in your Answer to the preceding interrogatory.

RESPONSE NO. 9: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. It does not now, and it has not since that time, manufactured, sold or distributed any asbestos-containing products.

INTERROGATORY NO. 10: Identify each individual who participated in the design and preparation of manufacturing specifications for each asbestos product identified in your Answer to Interrogatory No. 8.

RESPONSE NO. 10: This Defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 11: State whether any written memoranda, specifications, blueprints or other written materials of any kind or character now exist relating to the design and preparation of the asbestos products identified in your Answer to Interrogatory No. 8. If so, identify:

(a) Each such written material or document; and

(b) The custodian, identity and location of each written material or document.

RESPONSE NO. 11: This defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to Plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 12: Identify, by location and product, each plant of your in which the asbestos products identified in your Answer to Interrogatory No. 8 have been manufactured and/or assembled and the dates said plants have been in operation.

RESPONSE NO. 12: This defendant's manufacturing plants were located in Berlin, New Jersey and Sayreville, New Jersey. The Berlin plant was in operation from approximately 1943 until on or about April 30, 1958. The Sayreville plant was in operation from February, 1948 until about April 30, 1953.

INTERROGATORY NO. 13: If you have discontinued mining, manufacturing, producing, fabricating, importing, converting, compounding, processing, selling, merchandising, supplying, distributing and/or otherwise placing in the stream of commerce any asbestos products listed in your Answer to Interrogatory No. 8, identify the products discontinued, give the date of discontinuance and specify the reason(s) for such discontinuance.

RESPONSE NO. 13: In 1953, this Defendant entered into a sales agreement with Owens-Corning Fiberglas Corporation under which it agreed to the sale of asbestos-containing products to that corporation. This Defendant believes that it ceased the general marketing and sales of its asbestos-containing thermal insulation products at that time, disbanded its sales force, and that thereafter, Owens-Corning Fiberglas Corporation was the primary marketer of its product until the sale of the division to Owens-Corning Fiberglas Corporation in 1958.

INTERROGATORY NO. 14: If you have done so, when did you first determine that any other material could be used in place of asbestos for high-temperature insulation or any other use to or for which asbestos has been applied. If you have, in fact, substituted other material(s) for asbestos in your product(s), then state:

(a) The identity of such substituted material(s);

(b) When the product(s) with such substituted material(s) was first marketed; and

(c) The tradename(s) and brand name(s) of the product(s) marketed with such substituted material(s).

RESPONSE NO. 14: This defendant has located information in its records indicating that several efforts were made to substitute other materials for the asbestos in its Kaylo products; however, such efforts were unsuccessful. Defendant will make available to plaintiffs' counsel through its local counsel reports on such experiments. Some of the reports are contained on microfilm which is old and of poor quality.

INTERROGATORY NO. 20: Identify the distributors of your asbestos products at any time during the period from 1930 to the present and attach copies of all documents relating to said distributors. For each distributor, indicate:

(a) The terms of all assignments, agreements, licenses and other arrangements by and between you and said distributor;

(b) Whether the distribution relationship was exclusive;

(c) The year or years in which the distribution relationship was in effect;

(d) The identity of your asbestos products which the distributor was authorized to and did distribute; and

(e) The quantity of your asbestos products distributed by the distributor on a year-by-year and product-by-product basis.

RESPONSE NO. 20: To the extent that this Interrogatory seeks information for any state other than Maryland, this Defendant objects to this Interrogatory on the basis that it is overbroad and it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

Without waiving the above objection, and insofar as this Interrogatory pertains to Maryland, this Defendant states that McCormick Asbestos Company was a distributor of this Defendant's asbestos-containing products. In 1953, this Defendant entered into a sales agreement with Owens-Corning Fiberglas Corporation under which it agreed to the sale of asbestos-containing products to that corporation. This Defendant believes that it ceased the general marketing and sales of its asbestos-containing thermal insulation products at that time,

disbanded its sales force, and that thereafter, Owens-Corning Fiberglas Corporation was the primary marketer of its products until the sale of the division to Owens-Corning Fiberglas Corporation in 1958, and that these circumstances are the reason that it does not have records or correspondence which would enable it to answer this Interrogatory for the period after 1954.

INTERROGATORY NO. 21: State whether you have ever sold, distributed or otherwise furnished any of your asbestos products to any other person and/or business entity for resale or redistribution at any time from 1930 to the present. If so, state:

(a) The identity of each such person and/or business entity;

(b) The brand name, tradename and/or trademark adopted and used by you for each such product;

(c) The brand name, tradename and/or trademark adopted and used by each such person and/or business entity for each such product;

(d) The generic name or identity of each such product;

(e) The year(s) in which each such product was sold, distributed or otherwise furnished to each such person and/or business entity, and for each year, the quantity of each product sold, distributed or otherwise furnished;

(f) The intended marketable use for each such product;

(g) Whether each such product was intended to be used, resold, or distributed by such other person and/or business entity in the same or substantially the same condition as it was when shipped or delivered by you; and

(h) The custodian, identity and location of all documents pertaining to agreements for the resale, distribution, or furnishing of your asbestos products to each other person and/or business entity.

RESPONSE NO. 21: This Defendant ceased the manufacture, sale and distribution of asbestos-containing thermal insulation products in 1958. This Defendant states that in 1953 it entered into a "Sales Agreement" under which it agreed to sell certain amounts of its asbestos-containing thermal insulation products to Owens-Corning Fiberglas Corporation. Furthermore, this Defendant has found information in its records which indicate that in at least 1956, it placed Owens-Corning Fiberglas Corporation's logo on some of its boxes. This Defendant does not have information sufficient to further respond to this Interrogatory.

INTERROGATORY NO. 22: State the following with respect to the packages and containers in which you sold, distributed or otherwise furnished each of the asbestos products described in your Answer to Interrogatory Nos. 8 and 19 on a year-by-year and product-by-product basis;

(a) A description of the package or container in which each product was sold, distributed or otherwise furnished, including composition, size, shape and color;

(b) A description of the markings or printed material that appeared on each package or container, indicating the size and color of the same;

(c) A description of any logo or other design appearing on the package or container;

(d) A verbatim description of any caution or warning notice appearing on the package or container, setting forth the year(s) in which each such notice appeared on each such product; and

(e) A verbatim description of any instructions appearing on the package or container.

defendant made appropriate efforts to provide ventilation and to control the emissions of all dust emitted during the manufacturing process within recognized save levels of exposure, including the use of respirators in some instances, dust collection equipment and other devices as necessary. Therefore, during the period in which this defendant was in the business of manufacturing Kaylo it had no reason to believe that the foreseeable use of Kaylo would create a hazard to users.

The documents produced by Owens-Corning Fiberglas Corporation indicate that the September, 1955 publication in the A.M.A. Archives of Industrial Health was a publication of inhalation experiments.

To the extent that this interrogatory seeks the production of documents, such documents, as outlined in this response, have not been found as part of this defendant's records and, to the extent that this defendant is in possession of copies of documents, it possesses copies only of documents collected in preparation for litigation. This defendant objects to producing the same. The documents are available from their proper source.

INTERROGATORY NO. 39: Identify all trade organizations, associations or other entities to which you belong or belonged. Said organizations, etc., include, at a minimum, the following:

Asbestos Textile Institute (ATI);

Industrial Hygiene Foundation and/or Industrial Health Foundation (IHF);

Mineral Wool Institute;

Industrial Mineral Insulation Manufacturers Institute;

Magnesia Silica Insulation Manufacturers Association;

National Insulation Manufacturers Association (NIMA);

Thermal Insulation Manufacturers Association (TIMA);

Asbestos Information Association (AIA);

Quebec Asbestos Mining Association (QAMA);

National Safety Council;

Asbestos Cement Producers Association;

Refractories Institute.

RESPONSE NO. 39: This defendant objects to this interrogatory on the grounds that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence except as it relates to the period of time within which this defendant manufactured its asbestos-containing products.

Without waiving the above objection, this defendant states that insofar as this interrogatory refers to associations or organizations of which this defendant was a member during the time when it manufactured asbestos-containing products, it was a member of the Industrial Hygiene Foundation (which changed its name to the Industrial Health Foundation in 1970) for the years 1936 through 1975. This defendant was not a member of any of the other organizations about which this interrogatory inquires.

INTERROGATORY NO. 40: For each trade organization, association or other entity identified in your Answer to Interrogatory No. 39, state:

(c) All documents relating to Saranac Laboratory studies or tests which were received or submitted by you, either directly or indirectly through predecessor(s) in interest, subsidiary(ies) or affiliate(s), if any, through other companies, or through any trade associations, organizations or entities;

(d) All recommendations or findings of such studies in relation to:

(i) adequacy or inadequacy of the threshold limit values;

(ii) the substitution of materials for asbestos; and

(e) The custodian and location of all documents and/or communications identified in your Answer to this Interrogatory.

RESPONSE NO. 45: Refer to response to interrogatory no. 44.

INTERROGATORY NO. 46: State the amount of money spent or contributed by you annually from 1930 to the present for research of the relationship between exposure to asbestos dusts, fibers and/or products and any pulmonary pathology and identify each person or organization to whom the expenditure or contribution was made.

RESPONSE NO. 46: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

INTERROGATORY NO. 47: State whether you have ever maintained a library (or libraries) which contains books, articles, periodicals, journals and/or reference materials that relate to the subjects of asbestos, industrial hygiene, medicine, safety, occupational disease and/or engineering. If so, state:

Exhibit II

(a) The date each such library was established;

(b) The location of each such library;

(c) The identity of each librarian or other person in charge of the operation and materials of each such library;

(d) For whose use each such library was established;

(e) The title, publisher and dates of subscription to or acquisition of each such periodical or journal for each such library; and

(f) The title, author, publisher, date and dates of acquisition of each such article and book for each such library.

RESPONSE NO. 47: During the period of time pertinent to these actions, this defendant did not maintain an entity which would be characterized as an industrial hygiene, medicine, safety and/or engineering library. However, this defendant believes that a separate engineering library may have been maintained by its technical facility. This defendant also states that although it has no records indicating the existence of such a library, upon becoming involved in asbestos-related litigation this defendant listed all the publications which were in its then-existing industrial hygiene library. These publications are listed on **Exhibit II.** This defendant has not yet determined which, if any, of these publications were in this defendant's possession during the time it manufactured, sold and distributed asbestos-containing products.

INTERROGATORY NO. 48: State whether any of the co-defendants in asbestos litigation have ever furnished you with any information as to the state of the medical knowledge at any time regarding the relationship between exposure to asbestos dusts, fibers and/or products and the contracting of diseases, including asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers.

RESPONSE NO. 48: This defendant objects to this interrogatory as being irrelevant and not reasonably calculated to lead to the discovery of admissible evidence and not limited

to any issue which is the subject of this case. This defendant further objects to this interrogatory on the grounds that it seeks information within the work-product privilege and on the ground that it is oppressive and burdensome in that it would have to review all of the files and all of the records of all of its attorneys all over the country to respond to this interrogatory.

INTERROGATORY NO. 49: If your Answer to Interrogatory No. 48 is in the affirmative, identify:

(a) How the information was furnished;

(b) Who furnished said information;

(c) When said information was given to you; and

(d) The substance of said information.

RESPONSE NO. 49: Refer to objections to interrogatory no. 48.

INTERROGATORY NO. 50: State whether, at any time since 1930, you have interchanged, exchanged or communicated, the results of research, tests, studies or experiments regarding the relationship between exposure to asbestos dusts, fibers and/or products and the contracting of diseases, including asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers, with any other person, corporation or other business entity, including co-defendants in this action.

RESPONSE NO. 50: This defendant objects to this interrogatory insofar as it may seek to discover work product of counsel and trial preparation material. Without waiving such objection, this defendant states that it ceased the manufacture, sale and distribution of asbestos-containing products and does not have any records of having interchanged any of the material referred to in this interrogatory with any of the other defendants named in this case; however, this defendant states that defendant Owens-Corning Fiberglas Corporation was entitled

to receive and may have received from this defendant material of the type specified in this interrogatory pursuant to an Agreement dated March 9, 1958 by which this defendant sold the Kaylo Division to Owens-Corning Fiberglas, if in fact this defendant had any material of said type at that time. This defendant's investigation into the subject matter of this interrogatory is continuing.

INTERROGATORY NO. 51: If your Answer to Interrogatory No. 50 is in the affirmative, state:

(a) When said interchanges, exchanges or communications occurred;

(b) The identity of those persons, corporations or business entities who participated in said interchanges, exchanges or communications;

(c) The content of said interchanges, exchanges or communications; and

(d) The identity of the custodian of any documents which relate to said interchanges, exchanges or communications.

RESPONSE NO. 51: Refer to objection and response to interrogatory no. 50.

INTERROGATORY NO. 52: Identify all persons who have testified on your behalf before the Occupational Safety and Health Administration, the National Institute of Occupational Safety and Health, any United States congressional committee, sub-committee, administrative hearing or investigative proceeding on the subjects of the human health consequences of exposure to asbestos dusts, fibers and/or products and the setting, modification, feasibility and acceptance of allegedly safe or proper levels of exposure to said asbestos and asbestos products.

RESPONSE NO. 52: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not

RESPONSE NO. 97: Not applicable. Refer to response to interrogatory no. 96.

INTERROGATORY NO. 98: Identify any and all insurance agreements entered into by and between any person carrying on an insurance business and you which may be available to satisfy part or all of a judgment that might be entered in this action or to indemnify or reimburse you for payments made to satisfy the judgment. As to each such agreement, identify the insurance carrier, the amount of coverage and the applicable dates of coverage.

RESPONSE NO. 98: This defendant objects to this interrogatory on the grounds that it seeks information which is not relevant to the subject matter of this litigation and is not calculated to lead to the discovery of admissible evidence. Without waiving the above objections, this defendant has liability coverage by its insurer, Aetna, for some of the actions brought against it which allegedly result from the use of asbestos-containing products.

INTERROGATORY NO. 99: Describe the method by which you have maintained records concerning the manufacture, sale, advertising, distribution, delivery and installation of each of the asbestos products identified in your Answer to Interrogatory Nos. 8 and 19.

RESPONSE NO. 99: This defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958 pursuant to the sale of its Kaylo division to Owens-Corning Fiberglas Corporation on April 30, 1958. It has not found any information in its records pertinent to a record or document retention policy during the period when it manufactured its asbestos-containing products or for the period of years shortly thereafter. In accordance with the contract for the sale of the Kaylo division, in the ordinary course of business

relating to such sale, and because of the production of certain documents by counsel for Owens-Corning Fiberglas Corporation in several jurisdictions involving asbestos-related litigation in the United States, this defendant believes that most of its records pertinent to the Kaylo division were either transferred or made available to the purchaser of the division in 1958. This defendant states that it has not destroyed any documents or records pertaining to the Kaylo division which have been found in its records in 1975 (the year in which this defendant first became aware of asbestos-related actions against it) and thereafter.

INTERROGATORY NO. 100: With regard to the record-keeping method described in your Answer to Interrogatory No. 99, identify:

(a) Each present and former corporate department, division or subdivision responsible for maintaining the records;

(b) How the records are kept, e.g.,in boxes, files, on microfilm, microfiche or computer tape or disk;

(c) The inclusive dates of manufacture, sale, advertising, distribution, delivery and installation that the record keeping system covers;

(d) The location(s) where such records are maintained; and

(e) The identity of each person employed by you at any time from 1930 to the present, in the highest supervisory capacity, who is or was directly responsible for the collection and maintenance of such records.

RESPONSE NO. 100: Refer to response to interrogatory no. 99.

INTERROGATORY NO. 101: If the record keeping system described in your Answer to Interrogatory No. 99 includes use of microfilm, microfiche, computer tape or disk or any other system in which data is taken from other records, state whether you have

AFFIDAVIT

STATE OF OHIO)

)SS:

COUNTY OF LUCAS)

M. F. McCARTHY, being duly sworn according to law, deposes and says that he is an Assistant Secretary of Owens-Illinois, Inc., a defendant herein; that as such he is authorized to make an Affidavit on its behalf; and that the facts set forth in the foregoing DEFENDANT, OWENS-ILLINOIS, INC.'S ANSWERS TO INTERROGATORIES, are true and correct to the best of his knowledge, information and belief.

M. F. McCARTHY

SWORN TO and subscribed before me this 27th day of August, 1987.

Notary Public

My Commission Expires:

BEVERLY A. McNEAR
Notary Public — State of Ohio
My Commission Expires Jan. 29, 1990

IN THE CIRCUIT COURT FOR BALTIMORE CITY

*
* ALL CT-1 CASES
* ALL CT-2 CASES
* ALL CT-4 CASES
* ALL CT-5 CASES
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DEFENDANT OWENS-ILLINOIS, INC.'S ANSWERS TO PLAINTIFFS' MASTER INTERROGATORIES TO ALL DEFENDANTS

To: All Defendants, to be answered individually and separately by each Defendant.

Plaintiffs, by their attorneys, John T. Enoch, John Amato, IV, and Goodman, Meagher & Enoch, request Defendants to answer the following Interrogatories. The Interrogatories are to be read and answered in accordance with the following instructions and definitions.

a. These Interrogatories are continuing in character and, in accordance with the Maryland Rules, you are required to supplement your answers promptly after you obtain further material information.

RESPONSE NO. 2: This Defendant objects to this Interrogatory on the basis that it is overly broad and unduly burdensome, and calls for information which is immune from discovery under the attorney work product doctrine.

Without waiving above objections this Defendant states that it has referred to the relevant business records of the Owens-Illinois Glass Company, which are still in the possession of Owens-Illinois, Inc., in connection with the preparation of answers to these Interrogatories unless otherwise indicated.

INTERROGATORY NO. 3: State whether you are a corporation. If so, state: your corporate name; state of incorporation; date of incorporation; address of principal place of business; address(es) of any other place of business; whether, if you are a "foreign corporation" as defined in Maryland General Corporation Law Sec. 1-101(1), you are now or have ever been registered or qualified to do business in the State of Maryland; and the corporate name, state of incorporation and date of incorporation of any subsidiary, predecessor or affiliate corporation.

RESPONSE NO. 3: Owens-Illinois Glass Company was incorporated in the State of Ohio in 1929. Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965. The address of the principal place of business is One SeaGate, Toledo, Ohio 43666.

INTERROGATORY NO. 4: Identify all prior names by which you have existed.

RESPONSE NO. 4: Owens-Illinois Glass Company changed its name to Owens-Illinois, Inc. on April 28, 1965.

(g) The terms and conditions of any contracts or agreements by and between you and such corporation(s) or business entity(ies), including, but not limited to, the terms and conditions relating to the transfer of liabilities for obligations of such corporation(s) or business entity(ies);

(h) Whether you continued the manufacture, sale and/or distribution of such corporation's or business entity's asbestos products and, if so, whether you used the same product name(s) in so doing; and

(i) Whether there was an identity of name, officers, directors, personnel, property, suppliers, distribution outlets and/or clients between you and such corporation(s) or business entity(ies);

RESPONSE NO. 7: Refer to Response No. 6.

INTERROGATORY NO. 8: If you have directly or indirectly mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce asbestos or asbestos-containing products, state as to each such product, indicating separately those products dealt with by you, your predecessor(s) in interest, your subsidiary(ies), and your affiliate(s), if any, the following:

(a) Brand name, trade-name, and/or trade-mark;

(b) The generic name or identity;

(c) Description, including size, shape, color and composition, i.e. solid, powder or other form;

(d) Chemical and physical composition, including, but not limited to, the percentage of asbestos by weight and volume;

(e) Type of asbestos, i.e. chrysotile, amosite, crocidolite, actinolite, anthophyllite, or tremolite, indicating the percentage of each such asbestos fiber by weight and volume;

(f) Intended marketable use; and

(g) Dates during which each asbestos product was mined, manufactured, produced, fabricated, imported, converted, compounded, processed, sold, merchandised, supplied, distributed and/or otherwise placed in the stream of commerce.

RESPONSE NO. 8: **(a) Kaylo and Kaylo-20;**

(b) This Defendant's asbestos-containing products were hydrous calcium silicate materials;

(c) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

(d) This Defendant ceased the manufacture, sale and distribution of its asbestos-containing products in 1958. Its investigation as to the composition of each such product, including the type of asbestos-contained therein (i.e., amosite or chrysotile) and the quantitative percentage of asbestos, is continuing, although this Defendant now believes that this Defendant's commercially produced asbestos-containing products were hydrous calcium silicates containing between 13% and approximately 20% asbestos. Chrysotile asbestos was the primary type apparently used. Amosite was used to a lesser extent.

(f) The asbestos-containing products manufactured by this Defendant were intended to be used for industrial high temperature thermal insulation such as pipe covering and block insulation, and to increase fireproofing and fire protection and for insulation through use as a roof deck or fireproof material or door core material.

(g) Owens-Illinois Glass Company began limited pilot plant operations involving the production of "Kaylo" asbestos-containing products in 1943. It began the manufacture of commercial quantities of "Kaylo" asbestos-containing products in about 1948 and continued such manufacture until about April 30, 1958.

INTERROGATORY NO. 9: State whether you presently mine, manufacture, produce, fabricate, import, convert, compound, process, sell, merchandise, supply, distribute and/or otherwise place in the stream of commerce any asbestos product(s) listed in your Answer to the preceding interrogatory.

RESPONSE NO. 9: This Defendant ceased the manufacture, sale and distribution of asbestos-containing products in 1958. It does not now, and it has not since that time, manufactured, sold or distributed any asbestos-containing products.

INTERROGATORY NO. 10: Identify each individual who participated in the design and preparation of manufacturing specifications for each asbestos product identified in your Answer to Interrogatory No. 8.

RESPONSE NO. 10: This Defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 11: State whether any written memoranda, specifications, blueprints or other written materials of any kind or character now exist relating to the design and preparation of the asbestos products identified in your Answer to Interrogatory No. 8. If so, identify:

(a) Each such written material or document; and

(b) The custodian, identity and location of each written material or document.

RESPONSE NO. 11: This defendant has in its records technical reports relating to the development and testing of Kaylo, and will make available to Plaintiff's counsel through its local counsel these records. Many of the reports are contained on microfilm which is old and of poor quality. Adequate copies may not be made from it, and reading it requires a reader device. This defendant further states that its investigation into the subject matter referred to in this Interrogatory is continuing.

INTERROGATORY NO. 12: Identify, by location and product, each plant of your in which the asbestos products identified in your Answer to Interrogatory No. 8 have been manufactured and/or assembled and the dates said plants have been in operation.

RESPONSE NO. 12: This defendant's manufacturing plants were located in Berlin, New Jersey and Sayreville, New Jersey. The Berlin plant was in operation from approximately 1943 until on or about April 30, 1958. The Sayreville plant was in operation from February, 1948 until about April 30, 1953.

INTERROGATORY NO. 13: If you have discontinued mining, manufacturing, producing, fabricating, importing, converting, compounding, processing, selling, merchandising, supplying, distributing and/or otherwise placing in the stream of commerce any asbestos products listed in your Answer to Interrogatory No. 8, identify the products discontinued, give the date of discontinuance and specify the reason(s) for such discontinuance.

RESPONSE NO. 13: In 1953, this Defendant entered into a sales agreement with Owens-Corning Fiberglas Corporation under which it agreed to the sale of asbestos-containing products to that corporation. This Defendant believes that it ceased the general marketing and sales of its asbestos-containing thermal insulation products at that time, disbanded its sales force, and that thereafter, Owens-Corning Fiberglas Corporation was the primary marketer of its product until the sale of the division to Owens-Corning Fiberglas Corporation in 1958.

INTERROGATORY NO. 14: If you have done so, when did you first determine that any other material could be used in place of asbestos for high-temperature insulation or any other use to or for which asbestos has been applied. If you have, in fact, substituted other material(s) for asbestos in your product(s), then state:

(a) The identity of such substituted material(s);

(b) When the product(s) with such substituted material(s) was first marketed; and

(c) The tradename(s) and brand name(s) of the product(s) marketed with such substituted material(s).

RESPONSE NO. 14: This defendant has located information in its records indicating that several efforts were made to substitute other materials for the asbestos in its Kaylo products; however, such efforts were unsuccessful. Defendant will make available to plaintiffs' counsel through its local counsel reports on such experiments. Some of the reports are contained on microfilm which is old and of poor quality.

INTERROGATORY NO. 20: Identify the distributors of your asbestos products at any time during the period from 1930 to the present and attach copies of all documents relating to said distributors. For each distributor, indicate:

(a) The terms of all assignments, agreements, licenses and other arrangements by and between you and said distributor;

(b) Whether the distribution relationship was exclusive;

(c) The year or years in which the distribution relationship was in effect;

(d) The identity of your asbestos products which the distributor was authorized to and did distribute; and

(e) The quantity of your asbestos products distributed by the distributor on a year-by-year and product-by-product basis.

RESPONSE NO. 20: To the extent that this Interrogatory seeks information for any state other than Maryland, this Defendant objects to this Interrogatory on the basis that it is overbroad and it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

Without waiving the above objection, and insofar as this Interrogatory pertains to Maryland, this Defendant states that McCormick Asbestos Company was a distributor of this Defendant's asbestos-containing products. In 1953, this Defendant entered into a sales agreement with Owens-Corning Fiberglas Corporation under which it agreed to the sale of asbestos-containing products to that corporation. This Defendant believes that it ceased the general marketing and sales of its asbestos-containing thermal insulation products at that time,

disbanded its sales force, and that thereafter, Owens-Corning Fiberglas Corporation was the primary marketer of its products until the sale of the division to Owens-Corning Fiberglas Corporation in 1958, and that these circumstances are the reason that it does not have records or correspondence which would enable it to answer this Interrogatory for the period after 1954.

INTERROGATORY NO. 21: State whether you have ever sold, distributed or otherwise furnished any of your asbestos products to any other person and/or business entity for resale or redistribution at any time from 1930 to the present. If so, state:

(a) The identity of each such person and/or business entity;

(b) The brand name, tradename and/or trademark adopted and used by you for each such product;

(c) The brand name, tradename and/or trademark adopted and used by each such person and/or business entity for each such product;

(d) The generic name or identity of each such product;

(e) The year(s) in which each such product was sold, distributed or otherwise furnished to each such person and/or business entity, and for each year, the quantity of each product sold, distributed or otherwise furnished;

(f) The intended marketable use for each such product;

(g) Whether each such product was intended to be used, resold, or distributed by such other person and/or business entity in the same or substantially the same condition as it was when shipped or delivered by you; and

(h) The custodian, identity and location of all documents pertaining to agreements for the resale, distribution, or furnishing of your asbestos products to each other person and/or business entity.

defendant made appropriate efforts to provide ventilation and to control the emissions of all dust emitted during the manufacturing process within recognized save levels of exposure, including the use of respirators in some instances, dust collection equipment and other devices as necessary. Therefore, during the period in which this defendant was in the business of manufacturing Kaylo it had no reason to believe that the foreseeable use of Kaylo would create a hazard to users.

The documents produced by Owens-Corning Fiberglas Corporation indicate that the September, 1955 publication in the A.M.A. Archives of Industrial Health was a publication of inhalation experiments.

To the extent that this interrogatory seeks the production of documents, such documents, as outlined in this response, have not been found as part of this defendant's records and, to the extent that this defendant is in possession of copies of documents, it possesses copies only of documents collected in preparation for litigation. This defendant objects to producing the same. The documents are available from their proper source.

INTERROGATORY NO. 39: Identify all trade organizations, associations or other entities to which you belong or belonged. Said organizations, etc., include, at a minimum, the following:

Asbestos Textile Institute (ATI);

Industrial Hygiene Foundation and/or Industrial Health Foundation (IHF);

Mineral Wool Institute;

Industrial Mineral Insulation Manufacturers Institute;

Magnesia Silica Insulation Manufacturers Association;

National Insulation Manufacturers Association (NIMA);

Thermal Insulation Manufacturers Association (TIMA);

Asbestos Information Association (AIA);

Quebec Asbestos Mining Association (QAMA);

National Safety Council;

Asbestos Cement Producers Association;

Refractories Institute.

RESPONSE NO. 39: This defendant objects to this interrogatory on the grounds that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence except as it relates to the period of time within which this defendant manufactured its asbestos-containing products.

Without waiving the above objection, this defendant states that insofar as this interrogatory refers to associations or organizations of which this defendant was a member during the time when it manufactured asbestos-containing products, it was a member of the Industrial Hygiene Foundation (which changed its name to the Industrial Health Foundation in 1970) for the years 1936 through 1975. This defendant was not a member of any of the other organizations about which this interrogatory inquires.

INTERROGATORY NO. 40: For each trade organization, association or other entity identified in your Answer to Interrogatory No. 39, state:

(c) All documents relating to Saranac Laboratory studies or tests which were received or submitted by you, either directly or indirectly through predecessor(s) in interest, subsidiary(ies) or affiliate(s), if any, through other companies, or through any trade associations, organizations or entities;

(d) All recommendations or findings of such studies in relation to:

(i) adequacy or inadequacy of the threshold limit values;

(ii) the substitution of materials for asbestos; and

(e) The custodian and location of all documents and/or communications identified in your Answer to this Interrogatory.

RESPONSE NO. 45: Refer to response to interrogatory no. 44.

INTERROGATORY NO. 46: State the amount of money spent or contributed by you annually from 1930 to the present for research of the relationship between exposure to asbestos dusts, fibers and/or products and any pulmonary pathology and identify each person or organization to whom the expenditure or contribution was made.

RESPONSE NO. 46: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not reasonably calculated to lead to the discovery of admissible evidence.

INTERROGATORY NO. 47: State whether you have ever maintained a library (or libraries) which contains books, articles, periodicals, journals and/or reference materials that relate to the subjects of asbestos, industrial hygiene, medicine, safety, occupational disease and/or engineering. If so, state:

Exhibit II

(a) The date each such library was established;

(b) The location of each such library;

(c) The identity of each librarian or other person in charge of the operation and materials of each such library;

(d) For whose use each such library was established;

(e) The title, publisher and dates of subscription to or acquisition of each such periodical or journal for each such library; and

(f) The title, author, publisher, date and dates of acquisition of each such article and book for each such library.

RESPONSE NO. 47: During the period of time pertinent to these actions, this defendant did not maintain an entity which would be characterized as an industrial hygiene, medicine, safety and/or engineering library. However, this defendant believes that a separate engineering library may have been maintained by its technical facility. This defendant also states that although it has no records indicating the existence of such a library, upon becoming involved in asbestos-related litigation this defendant listed all the publications which were in its then-existing industrial hygiene library. These publications are listed on **Exhibit II.** This defendant has not yet determined which, if any, of these publications were in this defendant's possession during the time it manufactured, sold and distributed asbestos-containing products.

INTERROGATORY NO. 48: State whether any of the co-defendants in asbestos litigation have ever furnished you with any information as to the state of the medical knowledge at any time regarding the relationship between exposure to asbestos dusts, fibers and/or products and the contracting of diseases, including asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers.

RESPONSE NO. 48: This defendant objects to this interrogatory as being irrelevant and not reasonably calculated to lead to the discovery of admissible evidence and not limited

to any issue which is the subject of this case. This defendant further objects to this interrogatory on the grounds that it seeks information within the work-product privilege and on the ground that it is oppressive and burdensome in that it would have to review all of the files and all of the records of all of its attorneys all over the country to respond to this interrogatory.

INTERROGATORY NO. 49: If your Answer to Interrogatory No. 48 is in the affirmative, identify:

(a) How the information was furnished;

(b) Who furnished said information;

(c) When said information was given to you; and

(d) The substance of said information.

RESPONSE NO. 49: Refer to objections to interrogatory no. 48.

INTERROGATORY NO. 50: State whether, at any time since 1930, you have interchanged, exchanged or communicated, the results of research, tests, studies or experiments regarding the relationship between exposure to asbestos dusts, fibers and/or products and the contracting of diseases, including asbestosis, pneumoconiosis, mesothelioma, lung cancer and other cancers, with any other person, corporation or other business entity, including co-defendants in this action.

RESPONSE NO. 50: This defendant objects to this interrogatory insofar as it may seek to discover work product of counsel and trial preparation material. Without waiving such objection, this defendant states that it ceased the manufacture, sale and distribution of asbestos-containing products and does not have any records of having interchanged any of the material referred to in this interrogatory with any of the other defendants named in this case; however, this defendant states that defendant Owens-Corning Fiberglas Corporation was entitled

to receive and may have received from this defendant material of the type specified in this interrogatory pursuant to an Agreement dated March 9, 1958 by which this defendant sold the Kaylo Division to Owens-Corning Fiberglas, if in fact this defendant had any material of said type at that time. This defendant's investigation into the subject matter of this interrogatory is continuing.

INTERROGATORY NO. 51: If your Answer to Interrogatory No. 50 is in the affirmative, state:

(a) When said interchanges, exchanges or communications occurred;

(b) The identity of those persons, corporations or business entities who participated in said interchanges, exchanges or communications;

(c) The content of said interchanges, exchanges or communications; and

(d) The identity of the custodian of any documents which relate to said interchanges, exchanges or communications.

RESPONSE NO. 51: Refer to objection and response to interrogatory no. 50.

INTERROGATORY NO. 52: Identify all persons who have testified on your behalf before the Occupational Safety and Health Administration, the National Institute of Occupational Safety and Health, any United States congressional committee, sub-committee, administrative hearing or investigative proceeding on the subjects of the human health consequences of exposure to asbestos dusts, fibers and/or products and the setting, modification, feasibility and acceptance of allegedly safe or proper levels of exposure to said asbestos and asbestos products.

RESPONSE NO. 52: This defendant objects to this interrogatory on the basis that it seeks information which is not relevant to the subject matter of this litigation and is not

AFFIDAVIT

STATE OF OHIO)
)SS:
COUNTY OF LUCAS)

M. F. McCARTHY, being duly sworn according to law, deposes and says that he is an Assistant Secretary of Owens-Illinois, Inc., a defendant herein; that as such he is authorized to make an Affidavit on its behalf; and that the facts set forth in the foregoing DEFENDANT, OWENS-ILLINOIS, INC.'S ANSWERS TO INTERROGATORIES, are true and correct to the best of his knowledge, information and belief.

M. F. McCARTHY

SWORN TO and subscribed before me this 27th day of August, 1987.

Notary Public

My Commission Expires:

BEVERLY A. McNEAR
Notary Public — State of Ohio
My Commission Expires Jan. 29, 1990