

STATE OF ILLINOIS
IN THE CIRCUIT COURT OF THE ELEVENTH JUDICIAL CIRCUIT
COUNTY OF MC LEAN

NANCY KEILHACK, Individually and)
as Special Administrator of the)
Estate of Thomas Keilhack,)
deceased,)
)
Plaintiff,)
)
V.) No. 92 L 212
OWENS-CORNING FIBERGLAS)
CORPORATION, et al.,)
)
Defendants.)

**DEFENDANT, OWENS-ILLINOIS, INC.'S AMENDED AND SUPPLEMENTAL
ANSWERS TO PLAINTIFF'S FIRST SET OF INTERROGATORIES**

Defendant Owens-Illinois, Inc., without waiving any of its objections that were overruled by the Circuit Court on July 2, 1996, hereby provides its Amended and Supplemental Answers to Plaintiff's First Set of Interrogatories.

INTERROGATORIES

Q. 1. Have these interrogatories been answered fully and in good faith to the extent of the actual knowledge and information available to Defendant, OWENS-ILLINOIS, INC., its insurance carrier(s) and attorneys?

A. 1. These interrogatories request information about matters some of which occurred between forty and fifty

years ago. Moreover, Owens-Illinois last sold the kind of insulation product involved in this case in April, 1958, over thirty-eight years ago. Accordingly, many of the individuals who might have had personal knowledge of the matters asked about are now deceased or unavailable to Owens-Illinois.

However, a former Owens-Illinois industrial hygienist, Willis Hazard, gave deposition testimony in 1981 regarding the insulation products made by the Kaylo division at Owens-Illinois in the 1940's and 1950's. This testimony is the most comprehensive source of information regarding Owens-Illinois' perceptions regarding the safety of its asbestos-containing insulation products.

Mr. Hazard's testimony includes references to records regarding, among other things, animal experiments conducted at laboratories at Saranac Lake, New York (collectively the "Saranac Documents"). These records were, according to Mr. Hazard, transferred to Owens-Corning Fiberglas ("OCF") when Owens-Illinois sold the Kaylo division to OCF in April, 1958. These records were not found in the business records of Owens-Illinois, but copies of some of these documents were obtained by counsel for Owens-Illinois in the course of discovery in asbestos litigation.

Accordingly, the answers to these interrogatories are based largely on the testimony of Mr. Hazard, who is now deceased, and the Saranac Documents obtained by Owens-Illinois in the course of litigation. In addition, Owens-Illinois has reviewed the business records still in the possession of Owens-Illinois to answer some of these interrogatories. Finally, some of these answers to interrogatories are based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation.

While these answers are as accurate as currently possible, Owens-Illinois' investigation regarding many of the matters which are the subjects of these interrogatories is continuing, and Owens-Illinois cannot exclude the possibility that it may obtain more complete information or even information which indicates that a particular response being supplied is incorrect. Owens-Illinois has answered these interrogatories as fully as possible given the above limitations and in good faith based on the extent of its actual knowledge. See also the attached affidavit of H.G. Bruss.

Q. 2. Is the Defendant, OWENS-ILLINOIS, INC., a corporation? If so, state:

(a) the exact corporate name;

(b) the state of incorporation;

(c) the name and address and position within Defendant of the person providing sworn answers to these interrogatories.

A. 2.

(a) Owens-Illinois, Inc.;

(b) Delaware; and

(c) Howard G. Bruss, Assistant Secretary of Owens-Illinois, Inc., One SeaGate, Toledo, Ohio 43666.

Q. 3. Has anyone obtained from any person a statement (whether oral or written, signed or unsigned) concerning the occurrence involved in this cause of action? If so, state as to each statement:

(a) the name and last known address of the person making the statement;

(b) when, where and by whom the statement was taken;

(c) is there any tangible preservation of the statement, such as a document signed by the person making the statement, a tape-recording, a transcript or a memorandum purporting to reflect what was said?

(d) ~~if~~ your answer to (c) is affirmative, state the name and address of the person having possession of the tangible preservation of the statement.

A. 3. Assuming that the "occurrence involved in this cause of action" refers to the alleged inhalation of asbestos fibers by Thomas Keilhack and his subsequent death, Owens-Illinois has not obtained any such statement.

Q. 4. Has any private firm or company adjustor been directed to investigate the occurrence or ask questions of persons who may have knowledge of facts concerning the occurrence? If so, state the full name and address of each firm or adjustor.

A. 4. Assuming that "occurrence" refers to the alleged inhalation of asbestos fibers by Thomas Keilhack and his subsequent death, Owens-Illinois has not directed any such investigation.

Q. 5. Do you have any information regarding Thomas Keilhack's physical condition other than that information furnished you by Plaintiff's counsel? If so, state the nature of

that information, the name and address of its source, and if documentary in nature, who now has each.

A. 5. Assuming that such "information" does not refer to whatever information, if any, Owens-Illinois has received from any consulting experts, Owens-Illinois has no such information.

Q. 6. Were any photos taken of Thomas Keilhack? If so, state the total number of photos, the date of each photo, and who has each.

A. 6. Owens-Illinois did not take and does not possess any photographs of Thomas Keilhack.

Q. 7. Were you named or covered under any policy of liability insurance, effective on the date of the occurrence, which may be construed to provide coverage for any claim stated in the Complaint? If so, as to each policy, state:

- (a) the name of the company;
- (b) the policy number;
- (c) the effective period;
- (d) the maximum liability limits for:
 - (1) injury to any one person;

(2) aggregate personal injury limits;

(e) what amounts, if any, have previously been paid under the policy which in the opinion of the carrier reduces the coverage available;

(f) whether the carrier denied coverage or tendered a defense under a reservation of rights;

(g) whether the policy contains any first party medical pay or disability coverage, and, if so, describe the coverage.

A. 7. Assuming that "occurrence" refers to the alleged inhalation of asbestos fibers by Thomas Keilhack and his subsequent death, Owens-Illinois states that while the issues surrounding its insurance coverage for asbestos claims are complex, this particular case is not "covered under any policy of liability insurance" because the projected liabilities of Owens-Illinois are larger than its remaining insurance coverage. Owens-Illinois currently pays all its asbestos litigation costs out of its corporate revenues, although it expects that a certain portion of these costs to be reimbursed by certain insurance carriers.

Q. 8. Which, if any, of the carriers listed in your answer to the preceding interrogatory are providing a defense to this suit?

A. 8. Not applicable.

Q. 9. Identify those expert witnesses (as defined in Supreme Court Rule 220(a) (1) from whom you may offer opinion testimony at trial, and for each such expert, state:

(a) his name, current address, telephone number, occupation, and employer;

(b) the subject matter on which the expert is expected to testify;

(c) his conclusions and opinions and the basis therefore;

(d) his qualifications, including all formal education subsequent to high school, a history of his employment and the citation to each of his published writings;

(e) the amount paid, or agreed to be paid to him, specifying his hourly rate of compensation;

(f) the name of the first Plaintiff, first Defendant, the court in which filed, and the cause number for every cause in

which such expert has testified, whether at deposition or trial, and the date of his testimony.

A. 9. The identity of the particular expert witnesses to be called at trial has not been determined at the present time. However, Owens-Illinois reserves the right to select expert witnesses to be used at trial from the list of witnesses it has previously filed.

Q. 10. Identify with specificity any documents, objects, and tangible things, as defined in Supreme Court Rule 214, which are or were in the possession of any consulting expert as defined in Supreme Court Rule 220 which do not contain the consulting expert's opinion.

A. 10. Owens-Illinois believes that one of its co-Defendants, on behalf of certain Defendants including Owens-Illinois, engaged a consulting expert and provided that expert with pathology material and documents obtained from Plaintiff's counsel. Owens-Illinois and its counsel have no personal knowledge regarding which materials have been provided to that consulting expert. However, on information and belief, Owens-Illinois, states that pathology material and medical records from Central DuPage Hospital, as well as medical records from Elmhurst

Clinic, Stratford Internal Medicine, Suburban Lung Association, and the offices of Dr. J. Huml, as well as the Plaintiff's death certificate, have been provided to the consulting expert.

Q. 11. Has Defendant ever had one or more persons whose primary responsibility included looking after or monitoring the health of Defendant's employees, such as a medical director? If so, state the following as to each person who has held this position:

- (a) the name and address of the person;
- (b) the name of the position he or she held;
- (c) the dates during which he or she held the position;
- (d) the address of his or her office during the time he or she held the position;
- (e) state whether there was a written job description for that position at that time;
- (f) if there was a written job description, set forth the words of the description or attach a copy hereto.

A. 11.(a)-(d) Charles Shook, M.D., now deceased, was employed by Owens-Illinois from March 25, 1946 until June 30, 1960 and had primary responsibility for monitoring the health of Owens-Illinois employees. Dr. Glenn Usher succeeded Dr. Shook

for the period April 1, 1961 to December 31, 1969. Dr. George Bates held this responsibility from March 1, 1971 until his retirement on December 31, 1983. After December 31, 1983, Owens-Illinois did not have a full-time corporate medical director, although Dr. Bates has continued to provide part-time consulting services since his retirement. All medical directors have maintained offices at Owens-Illinois, Inc. One Seagate, Toledo, Ohio 43604.

(e) Owens-Illinois has found in its business records two written job descriptions for the position of Corporate Medical Director, one dated in 1973 and the other dated in 1984. Copies of these descriptions will be furnished to Plaintiff's counsel.

Q. 12. Has Defendant ever directed or contributed money toward a study of the effects of asbestos exposure upon the health of some or all of its employees? If so, state the following as to each such study:

- (a) the description or title of the study;
- (b) the dates during which it was made;
- (c) the location or locations of the plants at which the employees were employed;

(d) the number of employees studied;

(e) brief description of the study;

(f) whether any of the results were reported into written form, and if so, who now has a copy of the report.

A. 12.(a) Based on the deposition testimony of its former industrial hygienist, Willis Hazard, Owens-Illinois believes that Kaylo plant employees received periodic x-rays in an attempt to monitor whether there was any effect of asbestos exposure upon the health of those employees. These x-rays did not demonstrate any asbestos-related disease.

(b) The program appears to have been in effect as early as 1948. Owens-Illinois has not found information sufficient to determine when this program ended, but Owens-Illinois sold the Kaylo division to OCF in April, 1958.

(c) The employees were from plants located in Berlin and Sayreville, New Jersey;

(d) Owens-Illinois has not found information sufficient to answer this portion of this interrogatory;

(e) See answer to (a) above; and

(f) See answer to (d) above.

Q. 13. Have there been any studies of the effect of asbestos exposure upon the health of any of Defendant's employees? If so, state:

- (a) the description or title of the study;
- (b) the dates during which it was made;
- (c) the location or locations of the plants at which the employees were employed;
- (d) the number of employees studied;
- (e) brief description of the study;
- (f) whether any of the results were reported into written form, and if so, who now has a copy of the report.

A. 13. See answer to Interrogatory No. 12.

Q. 14. Is there a disease or disease process known as asbestosis?

A. 14. Based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation, Owens-Illinois believes that there is a disease known as asbestosis.

Q. 15. Is asbestosis caused by exposure to asbestos?

A. 15. Based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation, Owens-

Illinois believes that inhalation of asbestos dust in excessive amounts over a prolonged period of years may cause the disease asbestosis.

Q. 16. If your answer to the preceding interrogatory is in the affirmative, when did Defendant first learn that asbestosis was caused by exposure to asbestos?

A. 16. The only information Owens-Illinois has with respect to when it first learned that asbestosis was caused by exposure to asbestos is contained in the sworn deposition testimony of its former industrial hygienist, Willis Hazard. A copy of the transcript of Mr. Hazard's testimony will be provided to Plaintiff's counsel upon request.

Q. 17. Is there a disease or disease process known as lung cancer?

A. 17. Based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation, Owens-Illinois believes that there is a disease known as lung cancer.

Q. 18. Can lung cancer be caused by exposure to asbestos?

A. 18. Based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation, Owens-Illinois does not believe that mere exposure to asbestos can cause lung cancer, but does believe that there is an increased risk of lung cancer in individuals who develop the disease asbestosis.

Q. 19. If your answer to the preceding interrogatory is in the affirmative, when did Defendant first learn that lung cancer can be caused by exposure to asbestos?

A. 19. The only information Owens-Illinois has with respect to when it first learned that individuals who develop asbestosis are at an increased risk of lung cancer is contained in the sworn deposition testimony of its former industrial hygienist, Willis Hazard. A copy of the transcript of Mr. Hazard's testimony will be provided to Plaintiff's counsel upon request.

Q. 20. Does exposure to asbestos increase the incidence of lung cancer?

A. 20. See answer to Interrogatory No. 18.

Q. 21. If your answer to the preceding interrogatory is in the affirmative, state when Defendant first learned that exposure to asbestos increased the incidence of lung cancer.

A. 21. See answer to Interrogatory No. 19.

Q. 22. Is there a disease or disease process known as mesothelioma?

A. 22. Based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation, Owens-Illinois believes that there is a disease process known as mesothelioma.

Q. 23. Can mesothelioma be caused by exposure to asbestos?

A. 23. Based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation, Owens-Illinois believes that mesothelioma can be caused by exposure to certain types of asbestos.

Q. 24. If your answer to the preceding interrogatory is in the affirmative, when did Defendant first learn that mesothelioma can be caused by exposure to asbestos?

A. 24. The only information Owens-Illinois has with respect to when it first learned that mesothelioma can be caused by exposure to certain types of asbestos is contained in the sworn deposition testimony of its former industrial hygienist, Willis Hazard. However, in light of the fact that the association between asbestos exposure and mesothelioma was not established with scientific certainty until 1960, Owens-Illinois could not have learned that exposure to certain types of asbestos could cause mesothelioma until at least 1960, two years after it ceased manufacturing Kaylo. A copy of the transcript of Mr. Hazard's testimony will be provided to Plaintiff's counsel upon request.

Q. 25. Does exposure to asbestos increase the incidence of mesothelioma?

A. 25. Based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation, Owens-Illinois believes that exposure to certain types of asbestos above the threshold for the disease mesothelioma increases the incidence of mesothelioma.

Q. 26. If your answer to the preceding interrogatory is in the affirmative, state when Defendant first learned that exposure to asbestos increased the incidence of mesothelioma.

A. 26. The only information Owens-Illinois has with respect to when it first learned that exposure to certain types of asbestos above the threshold for the disease mesothelioma increases the incidence of mesothelioma is contained in the sworn deposition testimony of its former industrial hygienist, Willis Hazard. However, in light of the fact that the association between asbestos exposure and mesothelioma was not established with scientific certainty until 1960, Owens-Illinois could not have learned that exposure to certain types of asbestos above the threshold for the disease mesothelioma increases the incidence of that disease until at least 1960, two years after it ceased manufacturing Kaylo. A copy of the transcript of Mr. Hazard's testimony will be provided to Plaintiff's counsel upon request.

Q. 27. Is there a disease or disease process known as cancer of the gastrointestinal tract?

A. 27. Based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation, Owens-

Illinois believes that there is a disease or disease process known as cancer of the gastrointestinal tract.

Q. 28. Can cancer of the gastrointestinal tract be caused by exposure to asbestos?

A. 28. Based on the opinions of experts retained by Owens-Illinois in connection with asbestos litigation, Owens-Illinois does not believe that cancer of the gastrointestinal tract can be caused by exposure to asbestos.

Q. 29. If your answer to the preceding interrogatory is in the affirmative, when did Defendant first learn that cancer of the gastrointestinal tract can be caused by exposure to asbestos?

A. 29. Not applicable.

Q. 30. Does exposure to asbestos increase the incidence of cancer of the gastrointestinal tract?

A. 30. See answer to Interrogatory No. 28.

Q. 31. If your answer to the preceding interrogatory is in the affirmative, state when Defendant first learned that

exposure to asbestos increased the incidence of cancer of the gastrointestinal tract.

A. 31. Not applicable.

Q. 32. List the following information for each claim brought against Defendant by a present or former employee of Defendant or the spouse or child of a deceased such employee alleging a disease or condition of ill-being caused by asbestos (limited to claims brought prior to 1/1/80):

(a) the name and address of the person alleged to be diseased or in a condition of ill-being;

(b) when the alleged disease or condition of ill-being began;

(c) the circumstances under which the employee is alleged to have come into contact with asbestos;

(d) whether the person is represented by an attorney, and if so, the name and address of his attorney;

(e) the agency where the claim was filed, the docket number of the claim and the date the claim was filed.

A. 32. Owens-Illinois never received any workers' compensation or other claims for any asbestos-related disease from any employees of the Kaylo division, or spouses or children

of any deceased employees of that division. Owens-Illinois believes that it received workers' compensation claims for asbestos-related disease from employees not employed by the Kaylo division at the time of their claim. Owens-Illinois is not presently able to identify which specific workers' compensation claims were asbestos-related because the workers' compensation have been handled by several insurance carriers which cannot retrieve claims based on the nature of the injury involved. If requested, Owens-Illinois will identify each carrier and arrange for Plaintiff's counsel to have access to whatever files are still in existence.

Q. 33. List the following information for each claim, not identified in your answer to the preceding interrogatory, brought against Defendant by a present or former employee of Defendant or the spouse or child of a deceased employee alleging a disease or condition of ill-being caused by asbestos:

- a) the name and address of the person alleged to be diseased or in a condition of ill-being;
- b) when the alleged disease or condition of ill-being began;

c) the circumstances under which the employee is alleged to have come into contact with asbestos;

d) whether the person is represented by an attorney, and if so, the name and address of his attorney;

e) the agency where the claim was filed, the docket number of the claim and the date the claim was filed.

A. 33. See answer to Interrogatory No. 32.

Q. 34. List the following information for each claim or report, not identified in your answer to any preceding interrogatory, alleging a disease or condition of ill-being caused by asbestos or an asbestos containing product sold by Defendant (limited to suits prior to 1/1/80);

a) the name and address of the person alleged to be diseased or in a condition of ill-being;

b) when the alleged disease or condition of ill-being began;

c) the circumstances under which the employee is alleged to have come into contact with asbestos sold by you;

d) whether the person is represented by an attorney, and if so, the name and address of his attorney;

e) whether the claim has resulted in a lawsuit against you, and if so, the court where the suit was filed, the docket number of the suit, and the date the suit was filed.

A. 34. A list of the lawsuits for asbestos-related disease filed against Owens-Illinois before January 1, 1980 will be furnished to Plaintiff's counsel, including the court in which the suit was filed, the docket number, the date of filing and the name of Plaintiff's attorney. The information requested in subparts (b) and (c) of this interrogatory are matters of public record which would be no less burdensome for Plaintiff to obtain than for Owens-Illinois.

Q. 35. List the following information regarding each document (as defined in Supreme Court Rule 201(b)(1) authored by an employee of Defendant in the course of his employment, dealing in whole or in part with the consequences of exposure to asbestos:

(a) name, title or other means of identification of the document;

(b) name, position at time document authored, and current address, position and employer of each author of the document;

(c) date prepared or published;

(d) the name and address of the entity responsible for its publication and/or distribution;

(e) if available in typewritten or printed form, the number of pages.

A. 35. See documents produced in response to Plaintiff's First Request for Discovery, Number 12.

Q. 36. When did Defendant first sell asbestos or products containing asbestos?

A. 36. 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.

Q. 37. Does Defendant still sell asbestos or products containing asbestos? If not, when did Defendant stop selling?

A. 37. No. Owens-Illinois stopped selling Kaylo asbestos-containing insulation products in April, 1958. Commencing in 1963 and continuing through 1977, Kimble Glass

Company, a unit of Owens-Illinois, Inc., offered for sale gaskets, inserts and spacers as accessory parts intended for use in conjunction with Kimble's conical end glass piping system. Some of these accessory parts contained asbestos as one of their ingredients. These accessory parts were not manufactured by Kimble, but were purchased from other suppliers. From approximately 1966 through 1977, the Kimble Division also offered for sale a field beading kit which included a small plate and a covering over each of two small hoses. The plate and hose coverings may possibly have contained asbestos, but Owens-Illinois cannot yet confirm the ingredients of these materials based upon its business records presently reviewed. Kimble also sold Glass Lined Reactors manufactured by Schwelm for a period of time presently unknown, but apparently no later than the end of 1977, which incorporated gaskets containing asbestos as one of their ingredients. From 1982 through 1985, Kontes Glass Company, a subsidiary of Owens-Illinois during that time period, purchased certain asbestos-containing materials from other manufacturers and incorporated those materials into four of its products.

Q. 38. List the following information about each different type (as opposed to different sizes of the same type) of asbestos containing building and/or insulation product manufactured or sold by Defendant:

- (a) brand or trade name;
- (b) description;
- (c) uses Defendant recommended of it;
- (d) asbestos content;
- (e) dates of manufacture and/or sale.

A. 38. (a) Kaylo and Kaylo-20.

(b) Kaylo and Kaylo-20 were premolded, light density rigid products, and were manufactured in several forms: block, pipe covering, fire-door, roof tile and laminated panels. Kaylo was white or off-white in color, and Kaylo-20 was pinkish in color.

(c) The Kaylo asbestos-containing products manufactured by Owens-Illinois 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 as core material for use in fire doors and laminated panels.

(d) Owens-Illinois believes that its 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 incorporated to a lesser extent.

(e) 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 began the manufacture of commercial quantities of Kaylo-20 in or after mid-1955, and continued such manufacture until April 30, 1958.

Q. 39. Has Defendant, at any time since it began selling asbestos or asbestos containing products, issued a warning concerning the consequences of exposure to asbestos, which warning was intended by Defendant to reach those persons who would breath or ingest asbestos or asbestos containing products during their distribution and/or use? If so, state as to each such warning:

- (a) the language of the warning;
- (b) date first issued or distributed;

(c) date last issued or distributed;

(d) the method of communication or distribution used;

(e) the name, position at that time, and current address, position and employer of each person ordering or recommending the warning.

A. 39. Based on the deposition testimony of its former industrial hygienist, Willis Hazard, Owens-Illinois does not believe it ever issued any warning regarding any of its asbestos-containing insulation products because Owens-Illinois did not believe that persons using its asbestos containing products were at risk of developing any asbestos-related disease. Specifically, Owens-Illinois believed that there was a safe level of asbestos to which a person could be exposed without risk of injury and that people who worked with Owens-Illinois insulation products were not exposed to levels of asbestos above the safe levels.

Q. 40. If your answer to the preceding interrogatory is in the affirmative, state the following as to the first information Defendant received that exposure to asbestos caused disease:

- a) the form in which it was received, e.g., orally, in writing;
- b) if orally, the name and address of the person from whom received;
- c) if the information was received in written form, give the author, title of the document, and date of the document;
- d) the name and address of the employee or employees who received the information;
- e) briefly describe the information.

A. 40. Not applicable.

Q. 41. If your answer to the second preceding interrogatory was affirmative, list the name and address of each employee who was responsible to investigate whether:

- a) the warnings were reaching the persons who were breathing and/or ingesting the asbestos from the asbestos containing products;
- b) the warnings were being read by the persons who were breathing and/or ingesting the asbestos from the asbestos containing products;

c) the warnings were being understood by the persons who were breathing and/or ingesting the asbestos from the asbestos containing products;

d) the warnings were being heeded by the persons who were breathing and/or ingesting the asbestos from the asbestos containing products.

A. 41. Not applicable.

Q. 42. Did Defendant ever have one or more employees who routinely performed the task of sawing asbestos containing pipe covering? If so, state the following:

a) the name and address of each plant at which the process was conducted, and the inclusive period of years during which the process was conducted, at that plant;

b) the number of employees who performed the task for one year or more;

c) the name and address of each employee who performed the task for one year or more at one of Defendant's plants and who was known by Defendant to be free of asbestos disease 25 years or more after having first performed the task for at least one year.

A. 42. (a) Based on the Saranac Documents, the previous sworn testimony of Willis Hazard and Sam Schillaci, a former Kaylo division employee, Owens-Illinois believes that certain employees at Owens-Illinois' Berlin, New Jersey plant sawed Kaylo pipecovering in connection with the manufacturing process during the period that Owens-Illinois commercially manufactured Kaylo at Berlin, from 1948 through April 30, 1958. Owens-Illinois is unaware of the exact street address of the Berlin plant.

Pipecovering may have been manufactured at Owens-Illinois' Sayreville, New Jersey facility at some time between 1948 and 1953; however, Owens-Illinois has not found information sufficient to determine the specific time period involved. Owens-Illinois believes that its Sayreville facility was located on Bordentown Avenue.

(b) Owens-Illinois has not found information sufficient to answer this interrogatory.

(c) As of 1958, the date Owens-Illinois sold the Kaylo division, Owens-Illinois had manufactured asbestos-containing products for only 15 years. After the sale, many of the Kaylo division employees became employees of OCF. Owens-Illinois has no information regarding the health of those former employees.

Q. 43. List the following information regarding each worker or group of workers who, as of 1960, had used asbestos-containing building or insulation products for 25 years or more and were known by Defendant to be free of asbestos disease:

- a) current name and address;
- b) location(s) and inclusive dates of asbestos product usage;
- c) date(s) of the examination(s) which revealed the worker to be free of asbestos disease.

A. 43. See answer to Interrogatory No. 42(c).

Q. 44. List the following information regarding each instance where an employee of Defendant testified (at deposition or trial) in asbestos disease litigation:

- a) name of employee;
- b) date and place testimony was given;
- c) first named Plaintiff and Defendant, case number and court in which pending;
- d) name and address of reporter;
- e) whether you have a transcript of the testimony.

A. 44. Owens-Illinois is aware that the following present or former employees of Owens-Illinois 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 (trial), 10/11/84 (trial), 7/1/87 (trial), 12/12/90 (trial), 1/31/91 (trial), 10/23/91 (trial), 1/13/92 (trial), 2/8/95 (trial), 5/10/95 (trial), 2/14/96 (trial) and 4/18/96 (trial).

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: 2/11/81, 3/27/81, 12/14/81, and 1/27/82.

Howard G. Bruss, Esq.: 6/29/93.

David Van Hooser: 8/11/93 (trial)

Michael E. McConnell, Esq.: 2/24/89 and 10/25/90.

Richard R. Beck: 4/1/81.

Samuel F. Schillaci: 4/7/81, 7/31/81 (trial), 11/9/81 (trial), 11/17/81 (trial), 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), 10/8/86, 4/10/87 (trial), 6/25/87 (trial), 11/4/87 (trial), 1/20/88, 9/20/88 (trial), 10/15/88 (trial), 11/14/88 (trial), 11/22/88 (trial), 11/29/88 (trial), 12/8/88 (trial), 12/15/88 (trial), 3/14/89, 3/21/89, 3/28/89 (trial), 5/9/89 (trial), 6/15/89, 6/30/89 (trial), 7/7/89 (trial), 7/27/89, 8/18/89 (trial), 11/2/89 (trial), 11/6/89, 11/16/89 (trial), 11/17/89 (trial), 1/9/90 (trial), 1/31/90 (trial), 2/23/90 (trial), 3/14/90, 4/17-18/90, 4/24/90, 5/16/90 (trial), 5/24/90 (trial), 5/30/90 (trial), 6/8/90 (trial), 6/12/90 (trial), 6/20/90 (trial), 6/21/90 (trial), 6/29/90 (trial), 7/17/90 (trial), 7/19/90 (trial), 8/30/90 (trial), 10/11/90 (trial), 10/17/90, 11/20/90 (trial), 11/28/90 (trial), 12/11/90 (trial), 12/19/90 (trial), 1/24/91 (trial), 2/1/91 (trial), 2/22/91 (trial), 2/27/91, 3/8/91 (trial), 4/25/91 (trial), 4/26/91 (trial), 5/20/91 (trial), 6/13/91 (trial), 8/2/91 (trial), 8/8/91 (trial), 9/30/91 (trial), 10/8/91 (trial), 10/25/91 (trial), 10/30/91 (trial), 10/31/91 (trial), 11/4/91 (trial), 11/7/91 (trial), 11/13/91 (trial), 1/23/92 (trial), 1/28-29/92 (trial), 2/24/92 (trial), 12/15/92 (trial), 3/11/93 (trial), 3/12/93 (trial), 3/19/93 (trial), 5/21/93 (trial), 8/16/93 (trial), 2/2/94 (trial), and 6/17/94 (trial).

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.

Michael R. Scheiding: 6/13/95 (trial).

Robert Towles: 1/18/96

William Lugar: 5/15/96 and 5/16/96 (trial).

Q. 45. Withdrawn.

Q. 46. List the name and address of all international unions and local unions which have represented employees of Defendant while the employees were using asbestos containing products or were being exposed to asbestos, and indicate the address of the plant or group of employees represented and the date of such representation.

A. 46. Owens-Illinois has not found information sufficient to answer this interrogatory. However, in the course of its search for this information, Owens-Illinois has found materials that lead it to believe that the workers at the Berlin plant were represented by Local 231 of the G.B.B.A., the Glass Bottle Blowers Association. Owens-Illinois does not have any information regarding the local that might have represented employees at the Sayreville facility.

Q. 47. Did any of the unions listed in your answer to the previous interrogatory ever instruct, advise or caution your employees on the safe handling of asbestos or precautions to be taken when working in airborne asbestos? If so, please state for each instruction, advice or warning:

a) the name and address of the union and person instructing, advising or warning your employees;

- b) the method and content of the instruction, advice or warning;
- c) the dates of the instruction, advice or warning;
- d) whether the union ever promulgated, recommended or bargained for any regulations, standards or guidelines concerning the safe handling of asbestos or precautions to be taken when working in airborne asbestos.

NOTE TO DEFENDANT: You may reproduce this page as many times as necessary so that you have a separate page upon which to answer for each instruction, advice or warning.

A. 47. Owens-Illinois has not found information sufficient to answer this interrogatory.

Q. 48. Did Defendant sell, ship or deliver any asbestos containing products to any of the sites on Exhibit A? If so, state the following:

- a) the type and quantity sold, shipped or delivered;
- b) the date;
- c) describe or attach the documents evidencing such sale or shipment.

A. 48. Regarding the time period before 1953, Owens-Illinois has limited records. None of these records reflects shipments to any of the sites listed in Exhibit A. Regarding the period between 1953 and 1960, Owens-Illinois has obtained, in the course of litigation, copies of certain OCF invoices. These invoices were not found in Owens-Illinois, Inc.'s own records. None of these invoices reflects shipments to any of the sites listed on Exhibit A.

Q. 49. List the following information regarding each instance known to Defendant where an individual has testified (at deposition or trial) that a product manufactured or sold by Defendant was present or used at any of the sites on Exhibit A (in lieu of providing the answers to the following, you may provide a transcript of the testimony and Plaintiff's lawyer will pay your charges for providing the same):

- a) name and address of witness;
- b) first named Plaintiff, case number, and court in which case is pending;
- c) date of testimony;
- d) name and address of reporter;
- e) whether you have a transcript of the testimony.

A. 49. While counsel for Owens-Illinois has copies of hundreds of deposition transcripts from "fact" witnesses obtained over years of litigation, Owens-Illinois has no index of the sites identified in these transcripts, and the sites identified in these transcripts are not accessible by any computer search. Upon request, Owens-Illinois will provide Plaintiff's counsel with access to all of the deposition transcripts, in its possession, of fact witnesses obtained in cases litigated in Illinois, Wisconsin and Indiana.

Q. 50. On what date did Defendant first become aware that asbestosis was a compensable occupational disease under a State Worker's Compensation Act? (Source: GAF's Int. 53 in Reed, 83 L 68).

A. 50. The only information Owens-Illinois has with respect to when it first learned that asbestosis was a compensable occupational disease is contained in the sworn deposition testimony of its former industrial hygienist, Willis Hazard. A copy of the Hazard deposition will be provided to Plaintiff's counsel upon request.

Q. 51. Please describe the date, place and circumstances under which Defendant first became aware that any adverse effects of exposure to asbestos and asbestos containing materials may be cumulative in nature and that continued exposure to such materials by one suffering from asbestosis or related illnesses might have a significant adverse effect upon the extent and severity of such illness. In addition, please state:

a) the specific identity of each source of information providing or leading to such awareness; and

b) any change in Defendant's behavior, work rules, etc., precipitated by such awareness. (Source: GAF's Int. 54 in Reed, 83 L 68).

A. 51. (a) The only information Owens-Illinois has with respect to when it first learned that any adverse effects of the exposure to asbestos and asbestos containing materials may be cumulative in nature and that continued exposure to such materials by one suffering from asbestosis or related illnesses might have a significant adverse affect upon the extent and severity of such illness is contained in the sworn deposition testimony of its former industrial hygienist, Willis Hazard. A copy of the Hazard deposition will be provided to Plaintiff's counsel upon request.

(b) Based on the deposition testimony of its former Industrial Hygienist, Willis Hazard, Owens-Illinois believes that from the beginning of Kaylo production, Owens-Illinois made appropriate efforts to provide ventilation and to control the emissions of asbestos dust released 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.

Q. 52. Did Defendant ever suggest or recommend that persons using or exposed to the dust from Defendant's asbestos containing products might or should use any device to reduce exposure to, or inhalation of, asbestos dust or fibers? If so, please state for each and every such suggestion or recommendation:

a) date, time and place when each such suggestion or recommendation was made;

b) identify each person present when such suggestion or recommendation was made to or received by Plaintiff;

c) identify each person receiving same or similar suggestion or recommendation;

e) whether such suggestions or recommendation was written or oral, and

1) if written, please identify in detail each such writing;

2) if oral, identify all persons involved and details as to the manner in which each such suggestion or recommendation was presented;

f) type, make and model of each device referred to in each such suggestion or recommendation. (Source: GAF's Int. 58 in Reed 83 L 68).

A. 52. See answers to Interrogatories 39 and 51(b). However, Owens-Illinois has not found information sufficient to answer which persons were involved or the details of the ventilatory and/or respiratory practices used.

Q. 53. Withdrawn.

Q. 54. List the name and present address of all persons who have been a director in Defendant from the date of its incorporation to the present and list the dates during which the person was a director.

A. 54. Owens-Illinois will provide Plaintiff with the last known address of each living former and current inside director, and each current outside director.

Q. 55. List the name and current address of each person who has held any of the following offices in Defendant from the date of its incorporation to the present and also list the office held and the inclusive date during which the office was held: President, Vice-President; Secretary; and Treasurer.

A. 55. Owens-Illinois will provide Plaintiff with the last known address of each living former and current inside officer, and each current outside officer.

Q. 56. Withdrawn.

Q. 57. Pursuant to Supreme Court Rule 213(e), identify and give the location of those persons, not previously disclosed, having knowledge of facts relevant to the nature and extent of Thomas Keilhack's injury.

A. 57. To Owens-Illinois' knowledge there are none, excluding these individuals involved in preparing the defense of Owens-Illinois in this matter, such as attorneys, paralegals and

other related persons, and the consulting expert referred to in the answer to Interrogatory No. 10.

EXHIBIT A

Jobsites:

Mount Clare Bowling, 2957 Harlem Avenue, Chicago, IL;

Zenith Corporation, 1900 N. Austin Avenue, Chicago, IL;

Brookfield Zoo, Brookfield, IL;

Continental Assurance Company, 55 Jackson, Chicago, IL;

Tinker Toy Factory, Lake and Crawford (now Pulaski), Chicago, IL;

First National Bank of Lincolnwood, 6401 N. Lincoln Avenue,
Lincolnwood, IL;

Cenetex Project - Oak Grove Home Development - single family
dwellings in Chicago, area;

Ammice Brothers - Housing Project - single family dwellings in
Chicago area;

City of Chicago Low Income Housing Project, Chicago, IL

Kimberly Clark Executive Office Buildings, Menasha-Neenah, WI;

Appleton High School East, Appleton, WI;

City & County Building, Indianapolis, IN;

Purdue University, West Lafayette, IN;

Valparaiso University, Valparaiso, IN;

AFFIDAVIT

STATE OF OHIO)

) SS:

COUNTY OF WOOD)

H.G. BRUSS, 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.

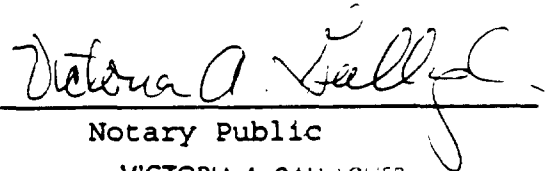


H.G. BRUSS

SWORN TO and subscribed before me this ¹⁵~~12~~ day of ^{August}~~January~~, 1996

My Commission Expires: September, 22 1997

SEAL



Notary Public

VICTORIA A. GALLAGHER

Notary Public, State of Ohio

My Commission Expires Sept. 22, 1997

CH13:60547.6 08.12.96 17.39

EXHIBIT I

NEW

KAYLO

HEAT INSULATING BLOCK
For Temperatures up to 1200° F.

**AMERICAN STRUCTURAL
PRODUCTS COMPANY
TOLEDO, OHIO
SUBSIDIARY OF
OWENS-ILLINOIS GLASS COMPANY**

A NEW HEAT INSULATION WITH A REMARKABLE COMBINATION OF ADVANTAGES....



Kaylo Heat Insulating Block is a new type of lightweight mineral insulation that is *efficient* enough to be used at ordinary room temperatures and *resistant* enough to perform effectively up to 1200° F.

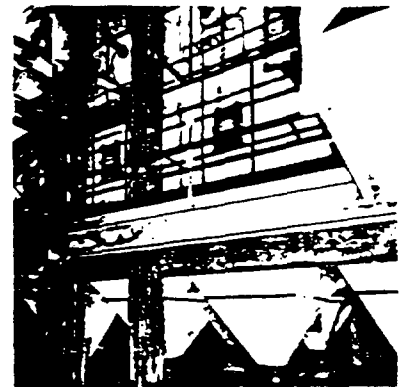
Few new products of any kind have been so thoroughly researched before being placed on the market. Kaylo Heat Insulating Block is the achievement of many years' work by Owen Illinois Glass Company engineers, physicists and chemists.

No other material, new or old, so effectively combines the most desirable characteristics of the ideal heat insulation.

For instance...

LOW DENSITY

Kaylo Heat Insulating Block weighs only 11 pounds per cubic foot. This light weight (less than one pound to the board foot) simplifies handling, shipping and application. Its great weight reduction is an important advantage on ships, for an example.



Notice the clean, straight edge on these insulated precipitator hoppers. Applicators find it easy to do this kind of work with Kaylo Heat Insulating Block because they are so easy to cut and yet they have a surprising flexural strength. The walls above the hoppers are also insulated with Kaylo Heat Insulating Block.

LOW THERMAL CONDUCTIVITY

The coefficient of conductivity, or K , of Kaylo Heat Insulating Block, is shown on the chart on page four. It is among the most efficient insulators for medium high temperatures. Its insulation value comes principally from its fine, interlaced cellular structure. These cells are so tiny and so numerous that they present a material surface of approximately 140 acres per cubic foot of insulation.

Experience shows that the insulation value of Kaylo insulation improves when the material is put into service.

EFFECTIVE OVER WIDE TEMPERATURE RANGE

Kaylo Heat Insulating Block performs efficiently not only on temperatures in the low pressure steam and hot water range but on temperatures in the superheated steam range as well. This is shown by the flatness of the conductivity curve. One-material coverage with Kaylo insulation handles applications which often require two thicknesses of different materials.

HIGH COMPRESSIVE STRENGTH

Its compressive strength is unusually 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 insulation of this type. This strength makes for easy handling and application, and contributes to long service with low maintenance.

NO ADDED BINDER

Kaylo insulation is an inorganic compound, containing no added binder. Its performance characteristics, therefore, are not affected by additives, which often reduce insulating value, modify effective temperature range or otherwise limit performance.

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 problem with Kaylo insulation. Even when subjected to an atmosphere of 90% relative humidity and a temperature of 120° F., in standard tests, specimens absorb less than 1% moisture by volume.

RETAINS EFFECTIVENESS 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 rumbling tests, run after prolonged heating, produce relatively little crumbling or breakdown of the material.

STANDARD SIZES

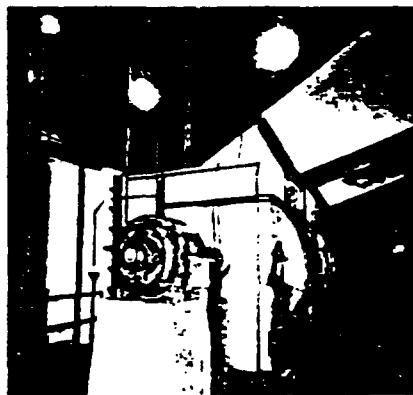
Lengths (inches)	Widths (inches)	Thicknesses (inches)
36	6	1
36	6	1½
36	6	2
36	6	2½
36	6	3
36	12	1
36	12	1½
36	12	2
36	12	2½
36	12	3

Other sizes are available on special order

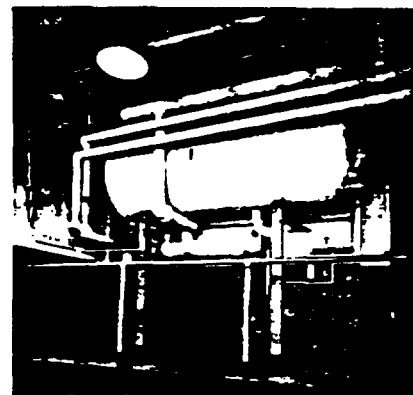
AND A REMARKABLE VERSATILITY



On large or small equipment, inside or out, Kaylo Heat Insulating Block performs efficiently and with a minimum of maintenance. Here it is being applied to the walls of a large precipitator. 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 covers both flat and curved surfaces on the power house equipment pictured here. At the right are fresh air intakes; the center compartments house induced 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 Insulating block are listed on the back page

OF KAYLO HEAT INSULATING BLOCK

EASY TO APPLY



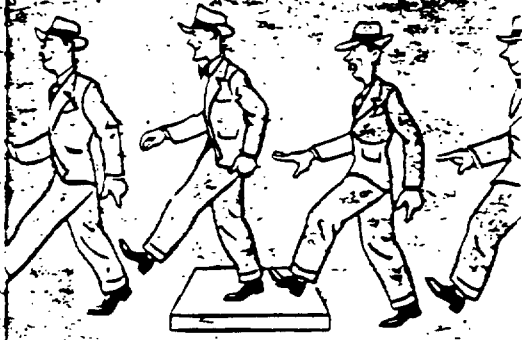
EXTREMELY LIGHTWEIGHT



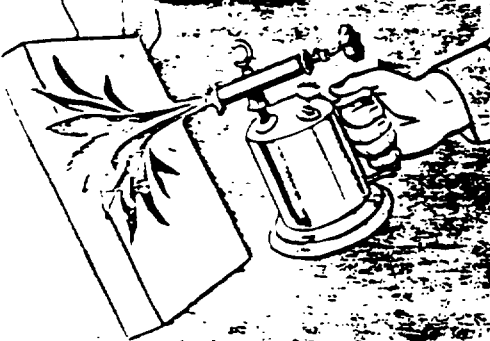
EASY TO APPLY



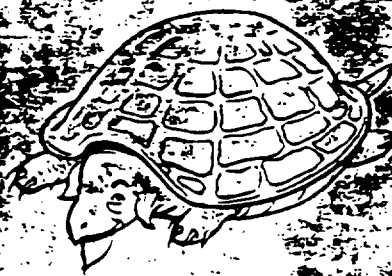
HIGH COMPRESSIVE STRENGTH



FIRE-PROOF



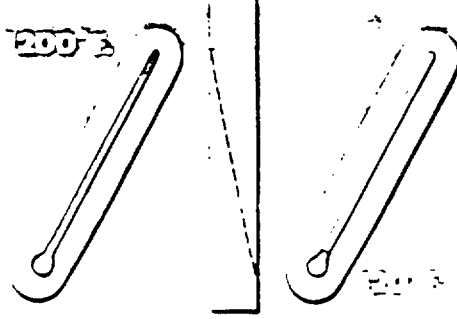
DURABLE

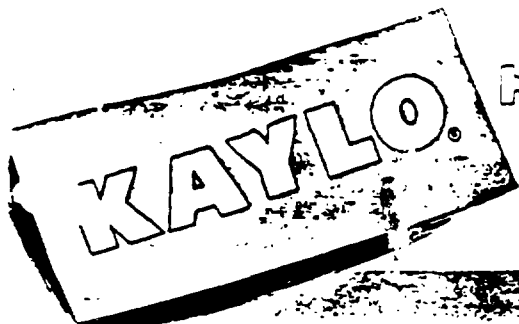


NO ADDED BINDER



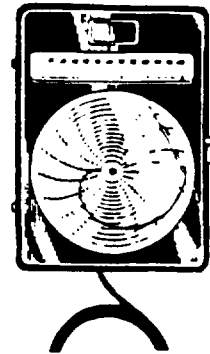
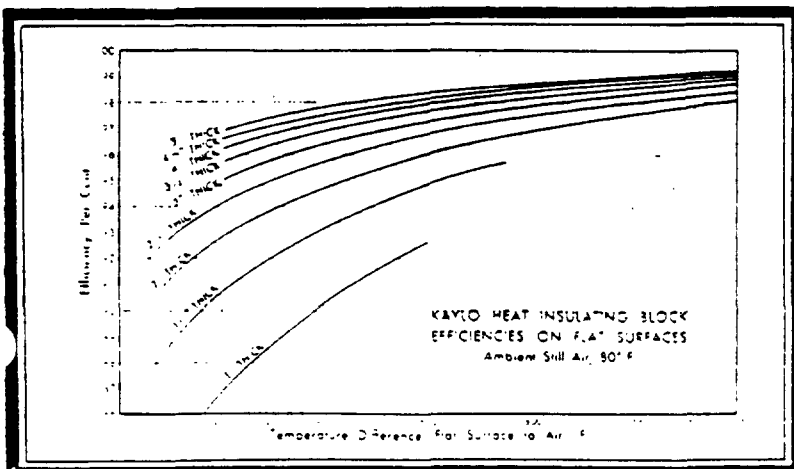
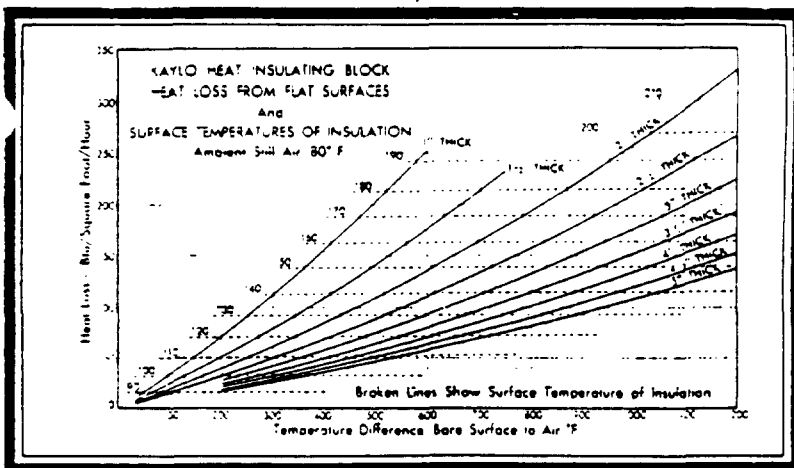
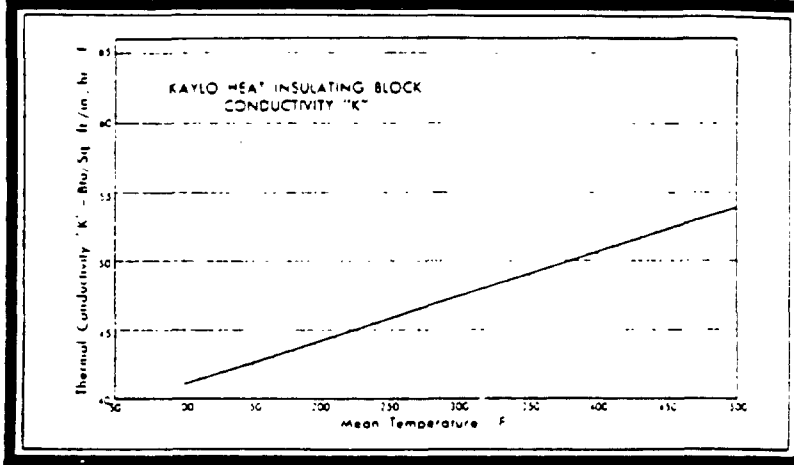
**EFFECTIVE OVER WIDE
TEMPERATURE RANGE**





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.

TENSILE 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 %

At 300° F. mean temperature..... 0.474

NEW

KAYLO®

HEAT INSULATING BLOCK



For Temperatures

Up To 1200° F.

AMERICAN STRUCTURAL
PRODUCTS COMPANY
1000 N. 10TH ST.
MILWAUKEE, WIS. 53233
CIRCLE 10 ON READER SERVICE CARD

Resist heat

WITH A REMARKABLE COMBINATION OF

KAYLO HEAT INSULATING BLOCK is a lightweight, non-combustible material that can be used in a wide range of temperatures and is available in a variety of sizes and shapes.

Because of its low thermal conductivity, it is an excellent insulator for walls, roofs, floors, and other structures. It is also resistant to fire, corrosion, and other forms of damage.

LOW DENSITY. Kaylo Heat Insulating Block weighs only 10 pounds per cubic foot. This light weight makes it easy to handle and install, simplifying handling, shipping and application.

LOW THERMAL CONDUCTIVITY. The coefficient of conductivity of Kaylo Heat Insulating Block places it among the most efficient insulations for medium-high temperatures. Its insulation value comes principally from its fine cellular structure. These cells are so tiny and so numerous that they present a material surface of approximately 1400 acres per cubic foot of insulation.

Experience shows that the efficiency of Kaylo insulation improves after exposure to service temperatures.

EFFECTIVE OVER WIDE TEMPERATURE RANGE.

Kaylo Heat Insulating Block is effective over a wide temperature range, from below zero to above 1000 degrees Fahrenheit. It is also resistant to fire, corrosion, and other forms of damage.

HIGH COMPRESSIVE STRENGTH.

Kaylo Heat Insulating Block has a high compressive strength, making it suitable for use in structural applications.

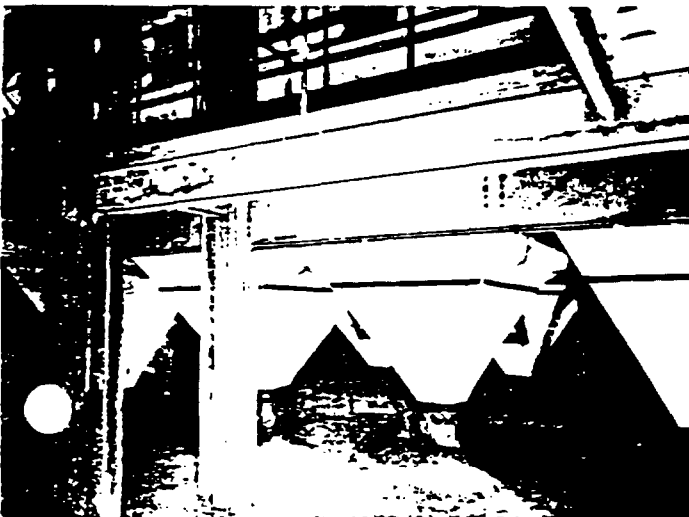
HIGH FLEXURAL STRENGTH.

Kaylo Heat Insulating Block has a high flexural strength, making it suitable for use in applications where bending is required.

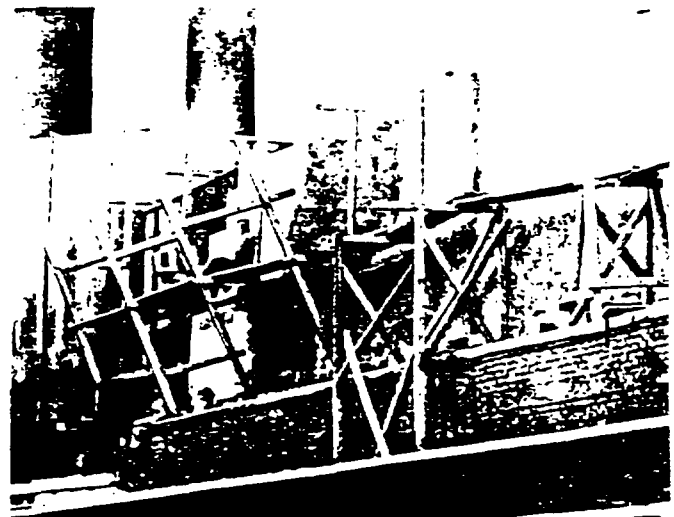
NO ADDED BINDER. Kaylo Heat Insulating Block is a compound containing no binder or other additives, which then reduces the effective temperature range and the performance.

EASY TO APPLY. Kaylo Heat Insulating Block is easy to cut and trim. They are also resistant to fire, corrosion, and other forms of damage.

Notice the clean, straight edges on these insulated precast concrete parts. Application is easy to work with Kaylo Heat Insulating Block because they are so easy to cut and yet have a high flexural strength.



On large or small equipment, Kaylo Heat Insulating Block performs efficiently and requires little maintenance. Here it is being applied to the side of a precast structure.



ADVANTAGES...

...KAYLO Heat Insulating Block is a lightweight, non-combustible, and non-toxic material. It is resistant to fire, acid, alkali, and most other corrosive materials. It is also resistant to mold and mildew, and it does not absorb moisture. It is a very durable material and it can be used in a wide variety of applications.

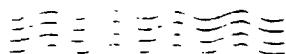
LOW MOISTURE ABSORPTION. Kaylo Heat Insulating Block is a non-porous material and it does not absorb moisture. It is resistant to mold and mildew, and it does not absorb moisture.

EFFECTIVE AFTER LONG SERVICE. Kaylo Heat Insulating Block is a very durable material and it can be used in a wide variety of applications. It is resistant to fire, acid, alkali, and most other corrosive materials. It is also resistant to mold and mildew, and it does not absorb moisture.

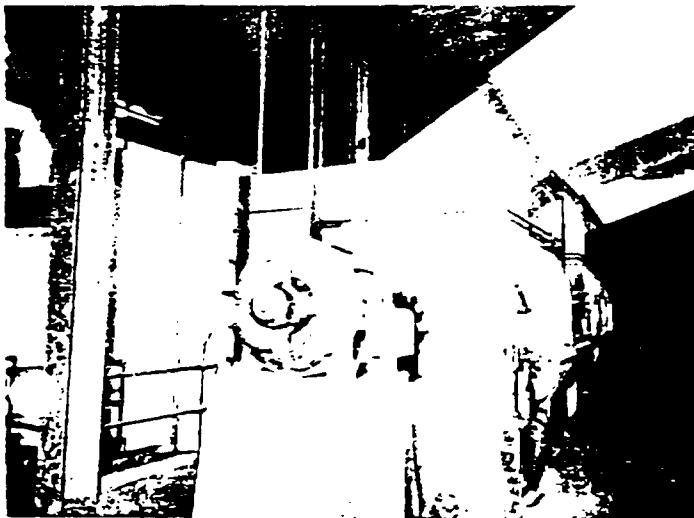
TYPICAL APPLICATIONS:

For use in the construction of buildings or small up to 12" x 12" x 12" Kaylo Heat Insulating Block to insulate:

Boilers	Heat exchangers	Turbines
Refrigerators	Chillers	Chilling Pits
Freezers	Condensers	Boilers
Refrigerators	Chillers	Refrigerators
Refrigerators	Chillers	Locomotives



Kaylo Heat Insulating Block is a very durable material and it can be used in a wide variety of applications. It is resistant to fire, acid, alkali, and most other corrosive materials. It is also resistant to mold and mildew, and it does not absorb moisture.



PHYSICAL CHARACTERISTICS

DENSITY

FLEXURAL STRENGTH

COMPRESSIVE STRENGTH

LOSS IN WEIGHT

RESISTANCE TO ABRASION

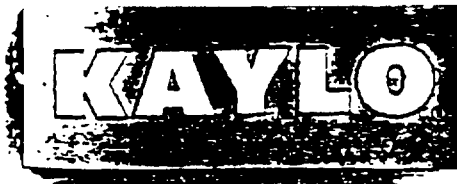
DIMENSIONAL STABILITY

MOISTURE ABSORPTION

CONDUCTIVITY K

STANDARD SIZES

LENGTH (inches)	WIDTH (inches)	THICKNESS (inches)
24	6	1
24	6	1 1/2
24	6	2
24	6	2 1/2
24	6	3
24	6	3 1/2
24	6	4
24	6	4 1/2
24	6	5
24	6	5 1/2
24	6	6
24	6	6 1/2
24	6	7
24	6	7 1/2
24	6	8
24	6	8 1/2
24	6	9
24	6	9 1/2
24	6	10
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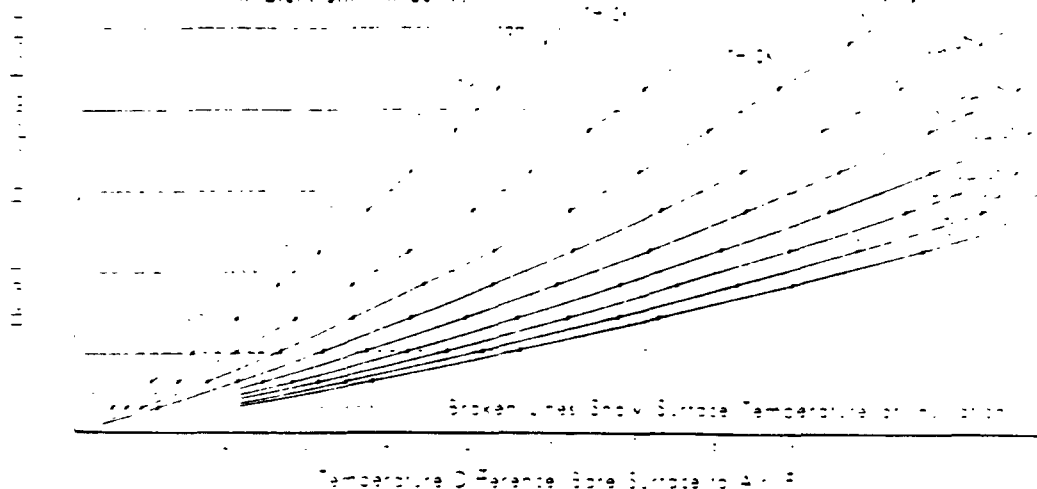
HEAT INSULATING BLOCK

Heat Loss, Surface Temperatures, and Efficiencies

HEAT LOSS FROM FLAT SURFACES

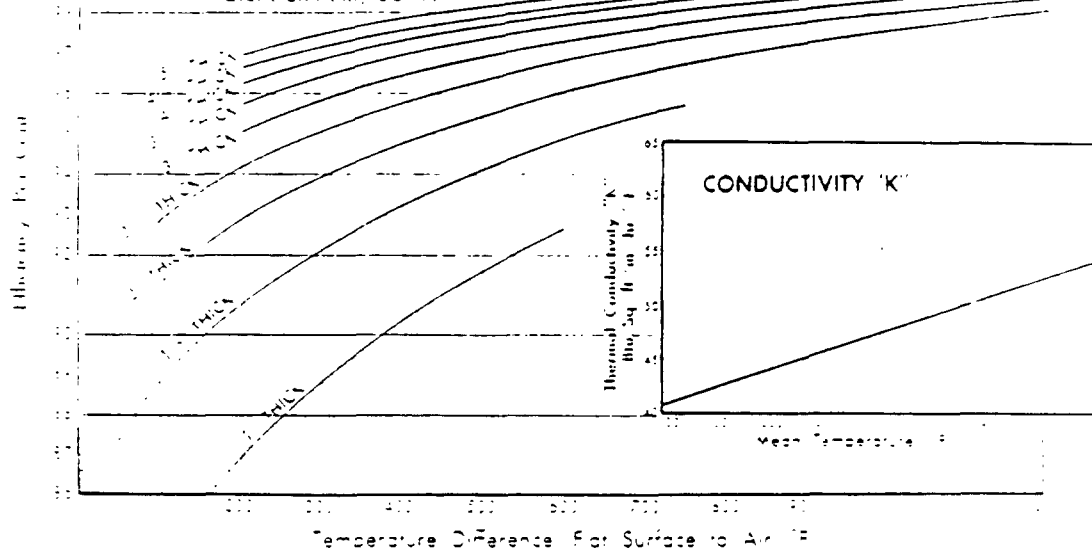
And
SURFACE TEMPERATURES OF INSULATION

Ambient Still Air 30° F.



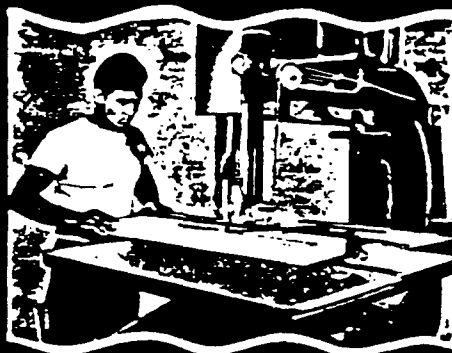
EFFICIENCIES ON FLAT SURFACES

Ambient Still Air 80° F.



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.

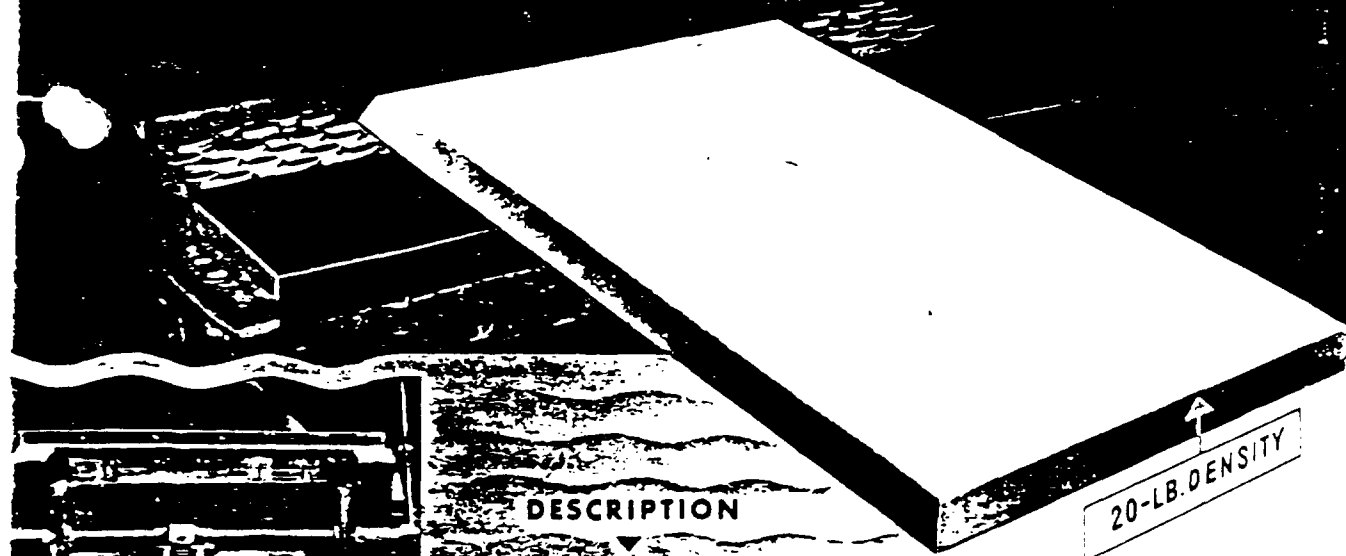
More detailed information on Kaylo Heat Insulating Block is available on request. American Structural Products Company, Toledo 1, Ohio



KAYLO®

20-LB. DENSITY

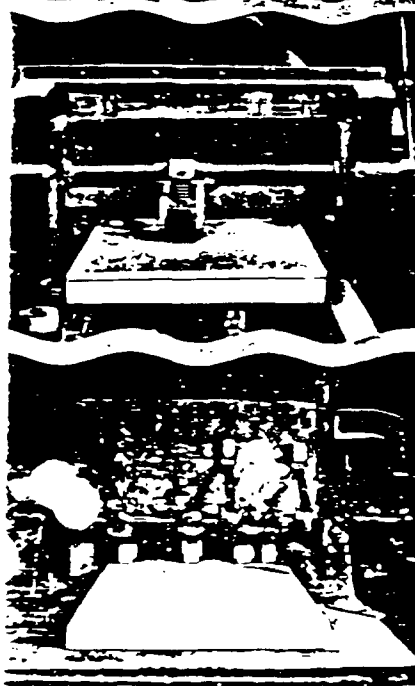
STRUCTURAL INSULATING BLOCK



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 average basis from 19.5 to 22 lb.), has a compressive strength of approximately 100 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

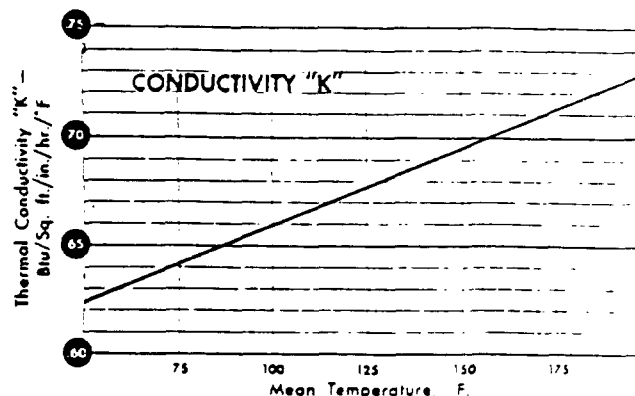
Light Weight—Nominal 20-lb. density Kaylo Block is about a third lighter than yellow pine. On an oven-dry basis it weighs from 19.5 to 22 pounds per cubic foot.

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 furnished bearing the Underwriters' label for fire hazard classification for building material.

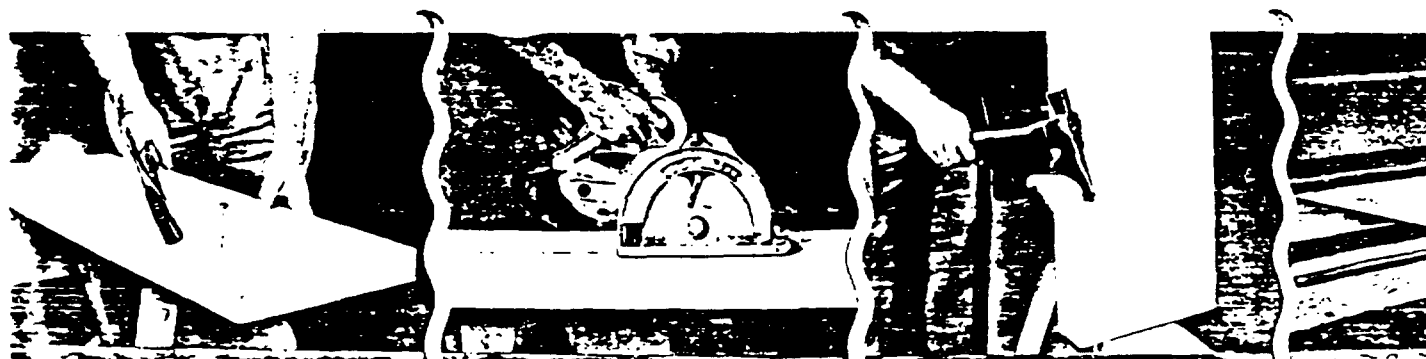


Good Insulation Value—At low mean temperatures Kay Structural Insulating Block is one of the most efficient structural mineral insulations. At high mean temperatures it still compares favorably with heat insulating materials of its own weight.

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 "binding" limitations."



L INSULATING BLOCK (20-LB. DENSITY)

Good Workability—Kaylo Structural Insulating Block is responsive to wood working tools. It can be sawed with a hand saw or power saw, can be routed, tongue-and-grooved, sanded, and, in fact, run through most wood-working equipment.

High Modulus of Elasticity—The modulus of elasticity of 20-lb. density block is approximately 160,000 lb. per sq. in.

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.

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.

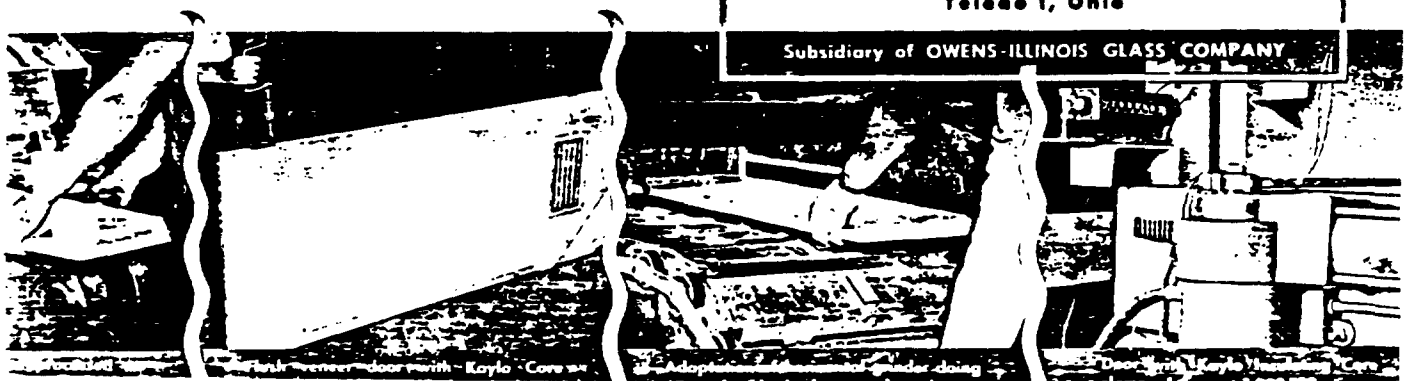
Certain thicknesses are suggested by certain building requirements. A thickness of from 1¾ to 2 inches of Kaylo Structural Insulating Block is required to withstand a typical building fire for one hour—usually somewhat more for a partition than for a door because of the greater performance required of 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 Pecora 718 E Weldwood A Insolute No. 1 A Interlake 4162 CD Vulcalock AB Dupont 4653 CDE Dupont 4646 CDE G. E. 2142 C G. E. 7031 C Vinylseal MA 28-18 E Amberlite PR14 D Bostik EXE 138 D Redux D	Durite No. 3026 A No. A, NH267 N100 C J MEC 826 CDE Weldwood A Insolute No. 1 A Interlake 4162 CD Vulcalock AB Dupont 4653 CDE Dupont 4646 CDE G. E. 2142 C G. E. 7031 C Vinylseal MA 28-18 E Amberlite PR14 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 Penacalite G1131 A Weldwood A Insolute 1 A G. E. 2142 C Plaskon 911 CD Selectron 5003 E 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) D	Vulcalock AB Dupont 4653 CDE Dupont 4646 CDE G. E. 7031 C Bostik 7026 D Bostik EXE 138 D Redux D	Dupont 4653 CDE G. E. 7031 C Bostik 7026 D Bostik EXE 138 D Redux D

Symbols for method of cure:

For Maximum Strength

- A** Clamped at room temperature for 24 hours.
- B** Clamped in oven at 120° F. for 1 hour.
- 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.

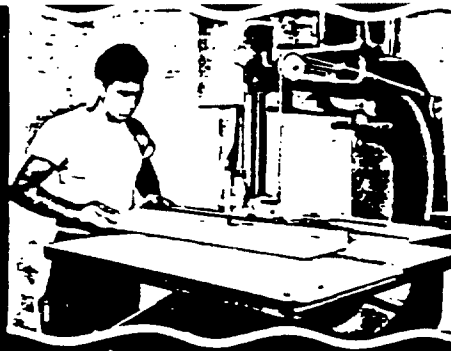
AMERICAN STRUCTURAL PRODUCTS COMPANY

TOLEDO 1, OHIO

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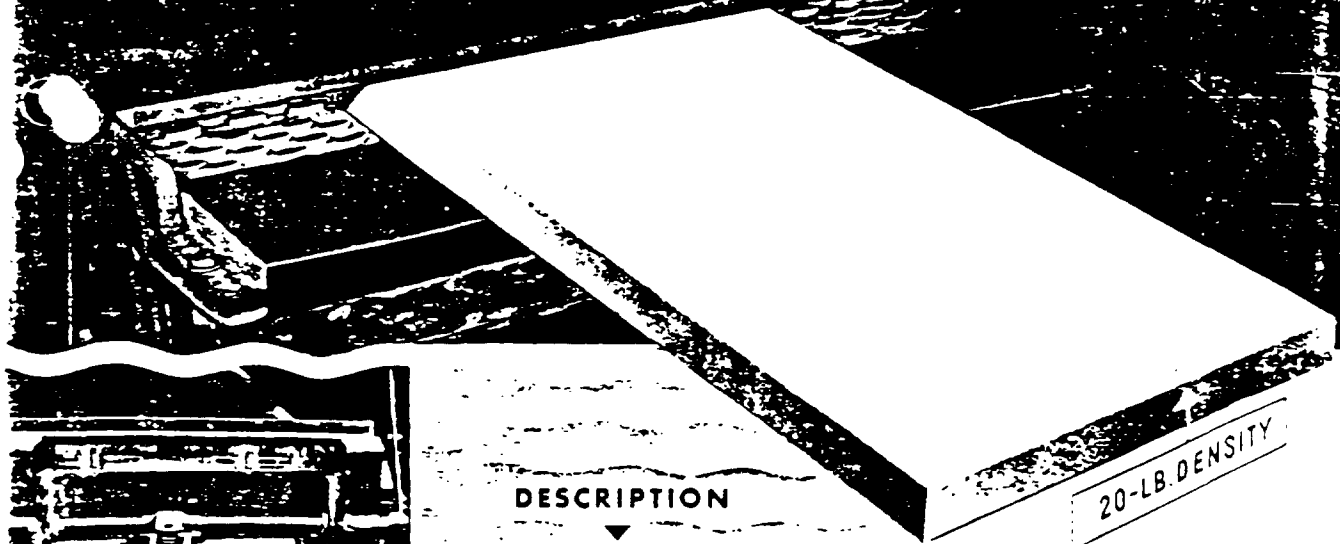
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KAYLO®

20-LB. DENSITY

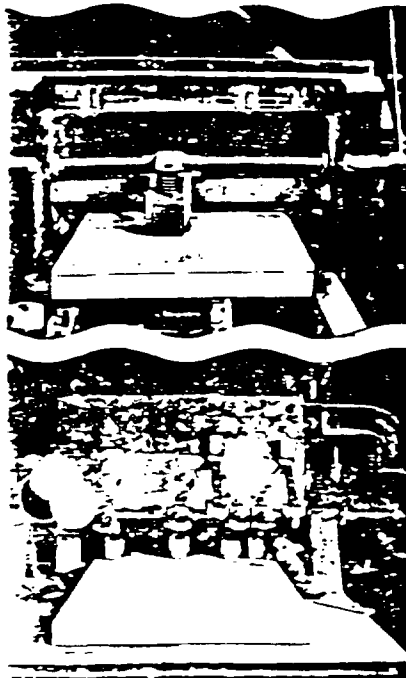
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KAYLO[®]

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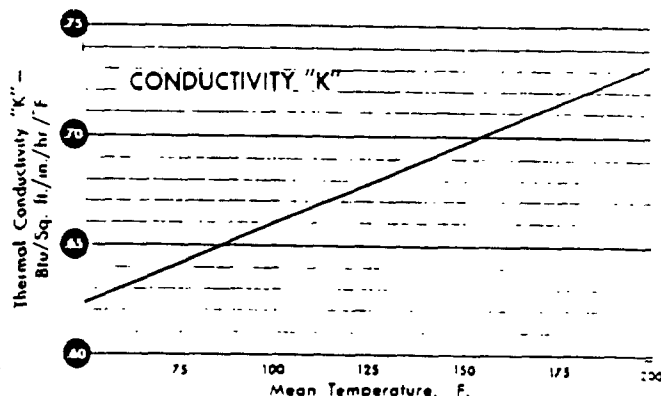
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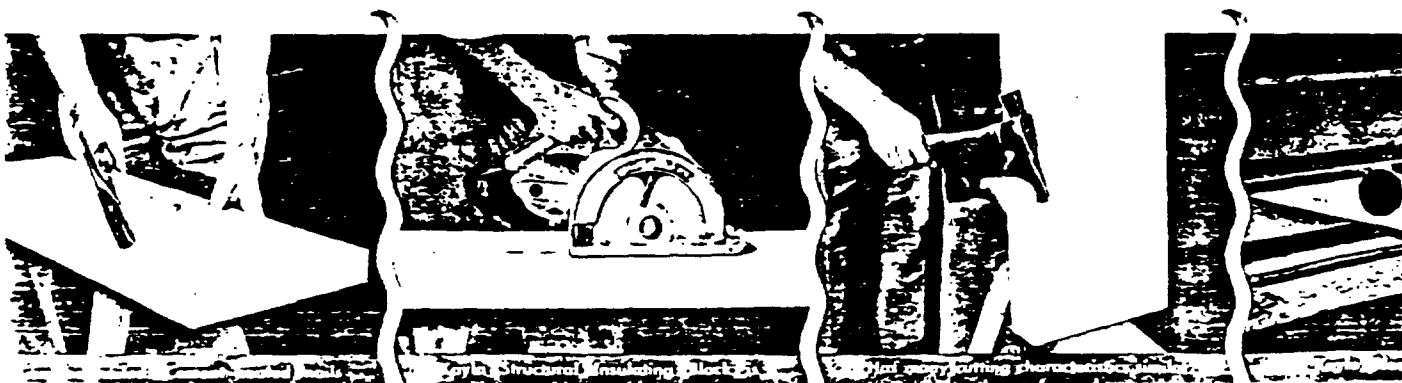


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No Added Binder—It contains no added binder, but instead constitutes its own binder. Hence its characteristics are not modified as to temperature limit, solubility, insulation value, fire resistance or otherwise by "binder limitations."



STRUCTURAL INSULATING BLOCK

Good Workability—Kaylo Structural Insulating Block is responsive to wood working tools. It can be sawed with a hand saw or power saw, can be routed, tongue-and-grooved, sanded, and, in fact, run through most wood-working equipment.

High Modulus of Elasticity—The modulus of elasticity of 20-lb. density block is approximately 160,000 lb. per sq. in.

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.

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.

**Kaylo Division
OWENS-ILLINOIS
GLASS COMPANY**

Toledo 1, Ohio



LAMINATION

Lamination 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



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
Penacalite G1131	A	N100	C	Penacalite G1131	A
Pecora 718	E	Pecora 718	E	Armstrong J 1162	D
Catabond 720	A	JMEC 826	C D E	Insolute 1	A
Vinylseal MA 28-18	E	Penacalite G1131	A	G.E. 2142	C
Amberlite PR 14	D	Insolute No. 1	A	Selectron 5003	E
Bostik 7026	D	Interlake 4162	C D	Vinylseal MA 28-18	E
Redux	D	Vulcalack	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.
- B Clamped in oven at 120° F. for 1 hour.
- 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.

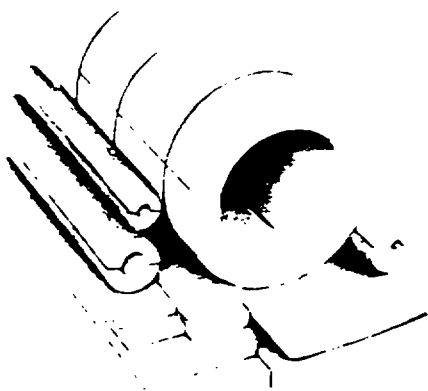
High-frequency curing has been tried successfully on an experimental basis with wood, aluminum and stainless steel bonded to a Kaylo insulating core. Many of the manufacturers making the above listed adhesives can provide adhesives suitable for high-frequency curing.

Kaylo Division
OWENS-ILLINOIS
GLASS COMPANY
Toledo 1, Ohio

HOW TO GET THE MOST OUT Of Your Insulating Dollars



The Right Material... Expert Application



First, Kaylo Heat Insulation is *proved* a better material than 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 know-how 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-373, Owens-Illinois Glass Company,
Kaylo Division, Toledo 1, Ohio



KAYLO

...first in calcium silicate

...pioneered by OWENS  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 N-373 appearing in the following publications:
Chemical Engineering, Jun. 1951
Oil & Gas Journal, Jun. 12, 1951
Petroleum Engineering, Jun. 1951
P. A. C. Jun. 1951
Pulp & Paper Refiner, Feb. 1951
Chemical Processing, Feb. 1951
Chemical Age, Feb. 1951
Chemical Week, Feb. 1951

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 $\frac{1}{4}$ 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. K-371, Owens-Illinois Glass Company,
Kaylo Division, Toledo 1, Ohio.



KAYLO

... first in calcium silicate

... pioneered by OWENS  ILLINOIS Glass Company

MAIN OFFICE: TOLEDO 1, OHIO—KAYLO SALES OFFICES: ATLANTA • CHICAGO • HOUSTON • NEW YORK • PHILADELPHIA • PITTSBURGH • ST. LOUIS

Owens-Illinois Glass Company

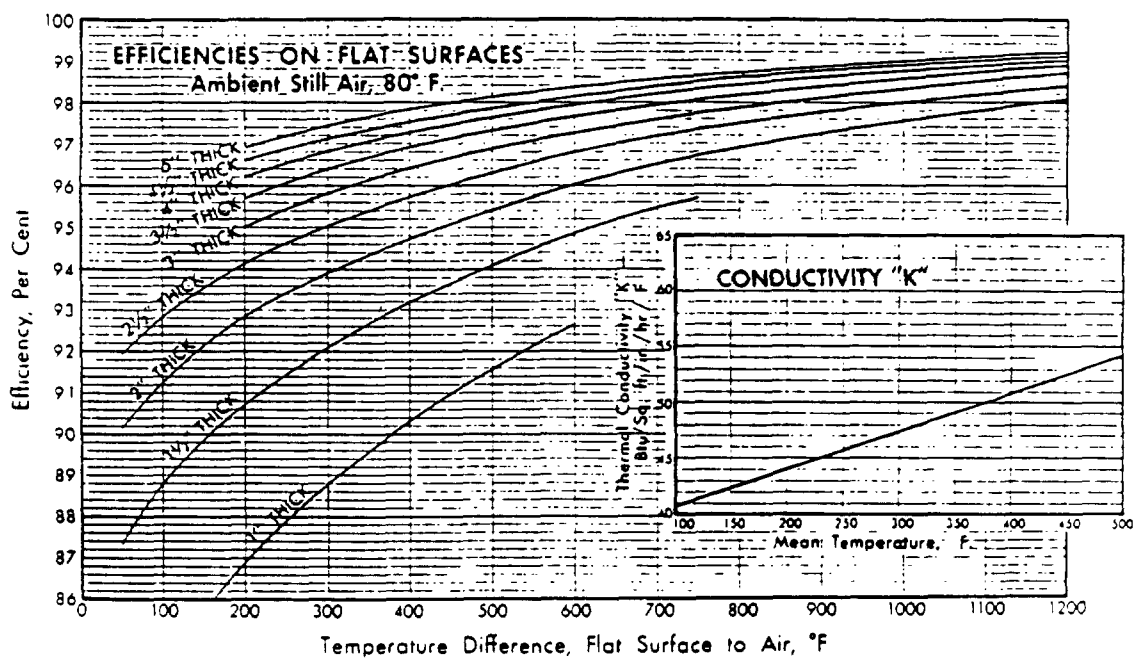
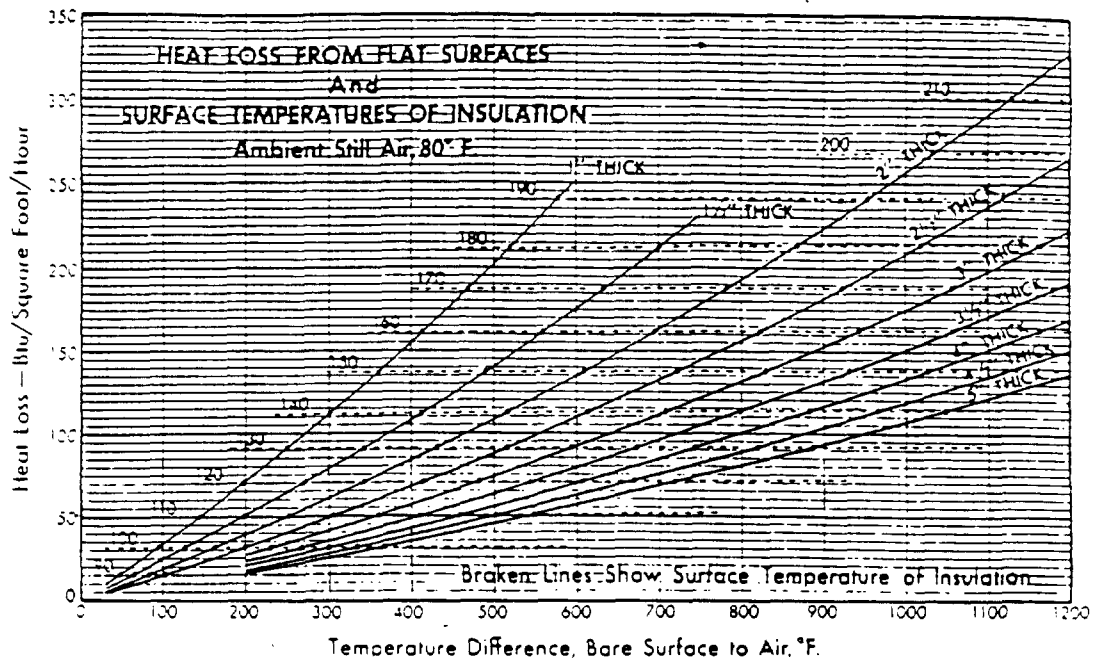
Advertisement No. K-154—appearing in the following publications:

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 Temperature, 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.

More detailed information on Kaylo Heat Insulating Block is available on request. American Structural Products Company, Toledo 1, Ohio.

ation

ADVANTAGES...

make a good-looking installation. Their "feel" is pleasant and non-irritating. They can be cut, scored and sawed with ordinary woodworking 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. Kaylo Heat Insulating Block absorbs little moisture from surrounding humid 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.

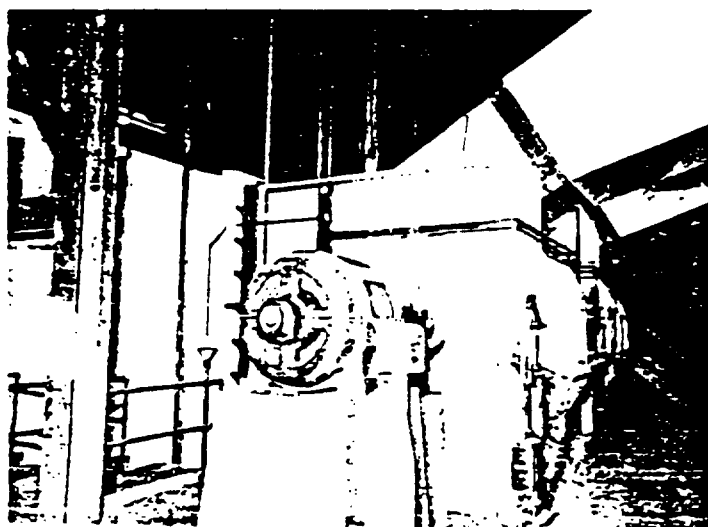
TYPICAL APPLICATIONS:

Indoor or outside, for large installations or small, up to 12" 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)
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 hours
at 750° F..... 1.8%
at 1000° F..... 2.9%
at 1200° F..... 3.6%
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	1 1/2
36	6	2
36	6	2 1/2
36	6	3
36	12	1
36	12	1 1/2
36	12	2
36	12	2 1/2
36	12	3

Other sizes are available on special order.

*Sensational
New*

KAYLO FIREDOOR®

The Only Type of Wood-Faced Door
with an Underwriters 1-Hour Fire Rating

Underwriters Laboratories Inc.
TESTED
FIREDOOR FOR OPENING IN VERTICAL SHAFT

A Product of OWENS-ILLINOIS GLASS COMPANY
Manufactured by THE KAYLO DIVISION

The KAYLO FIREDOOR

Sets New Standard

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.

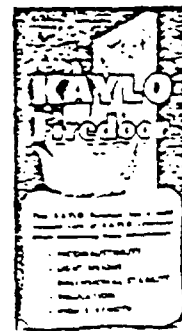
THE INORGANIC KAYLO CORE

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

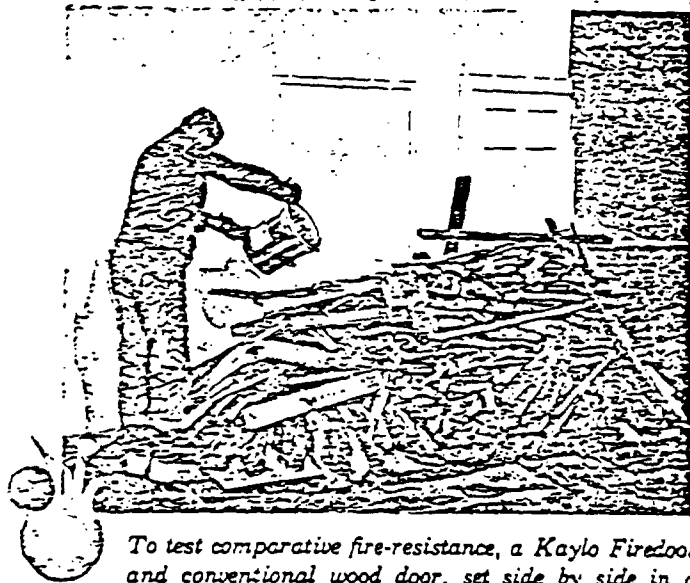
sturdy to insure proper performance of the Kaylo Firedoor under most severe conditions.

Kaylo Firedoors offer a great combination of advantages for hospitals, schools, apartment houses, hotels, office buildings—and residences.

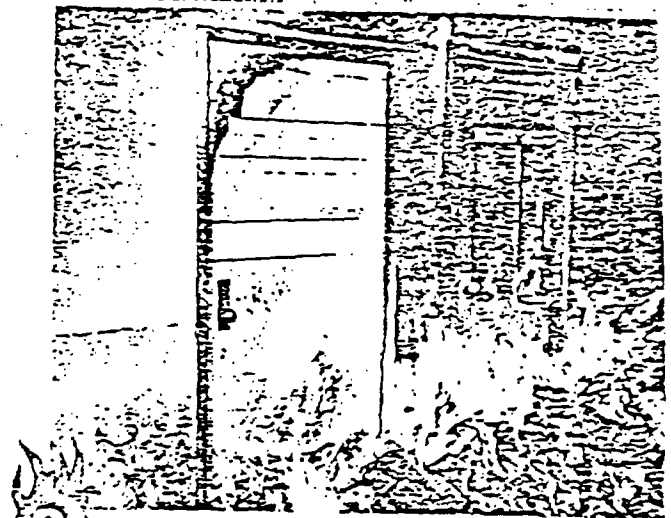
This label on doors which you specify or install means rated fire protection, safety and reduced insurance rates for building owners. It appears on every Kaylo-core door.



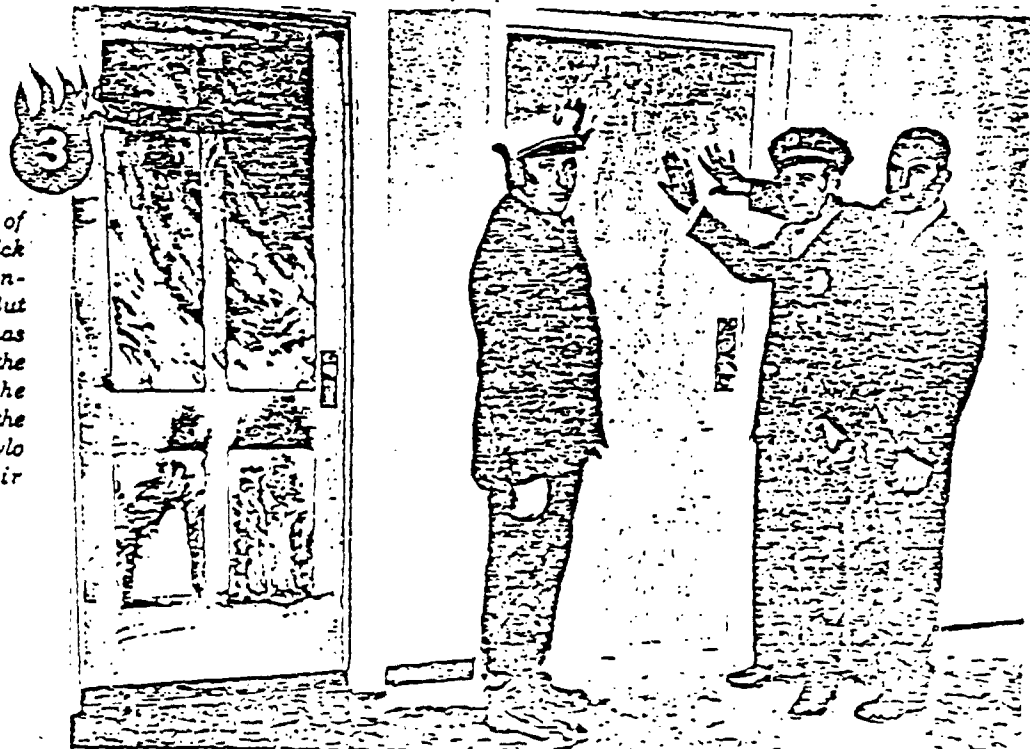
Beauty and Stability with Fire Protection



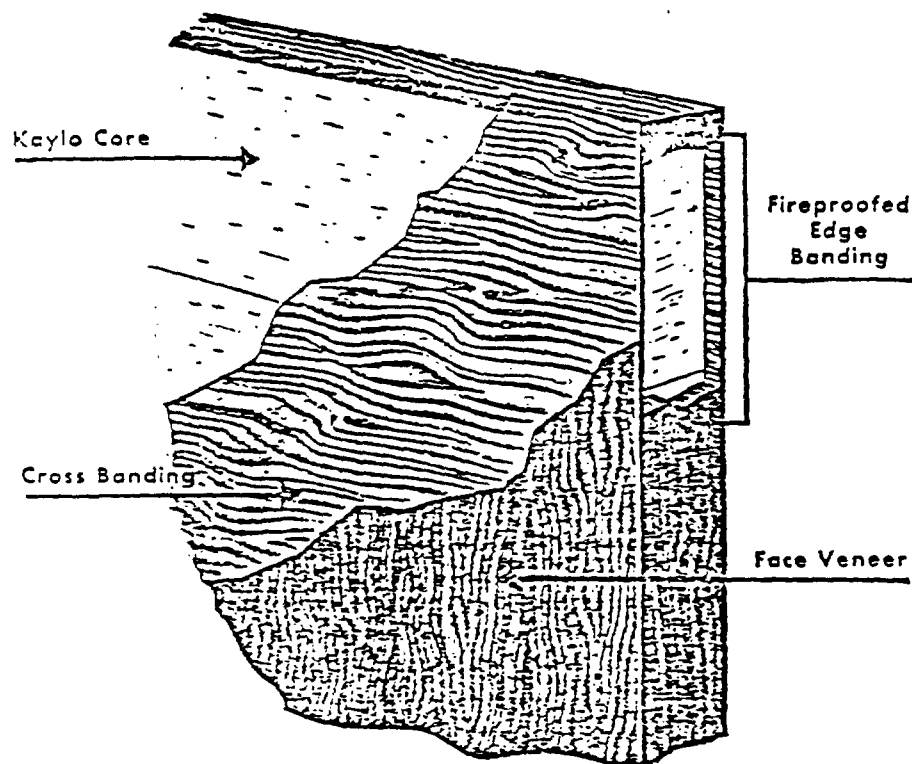
To test comparative fire-resistance, a Kaylo Firedoor and conventional wood door, set side by side in a concrete wall, are exposed simultaneously to fire.



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.



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 Fire-door. 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 Fire-door 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 water-proof 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 water-proof phenolic glue.

OWENS-ILLINOIS GLASS COMPANY

Kaylo Division • Toledo 1, Ohio

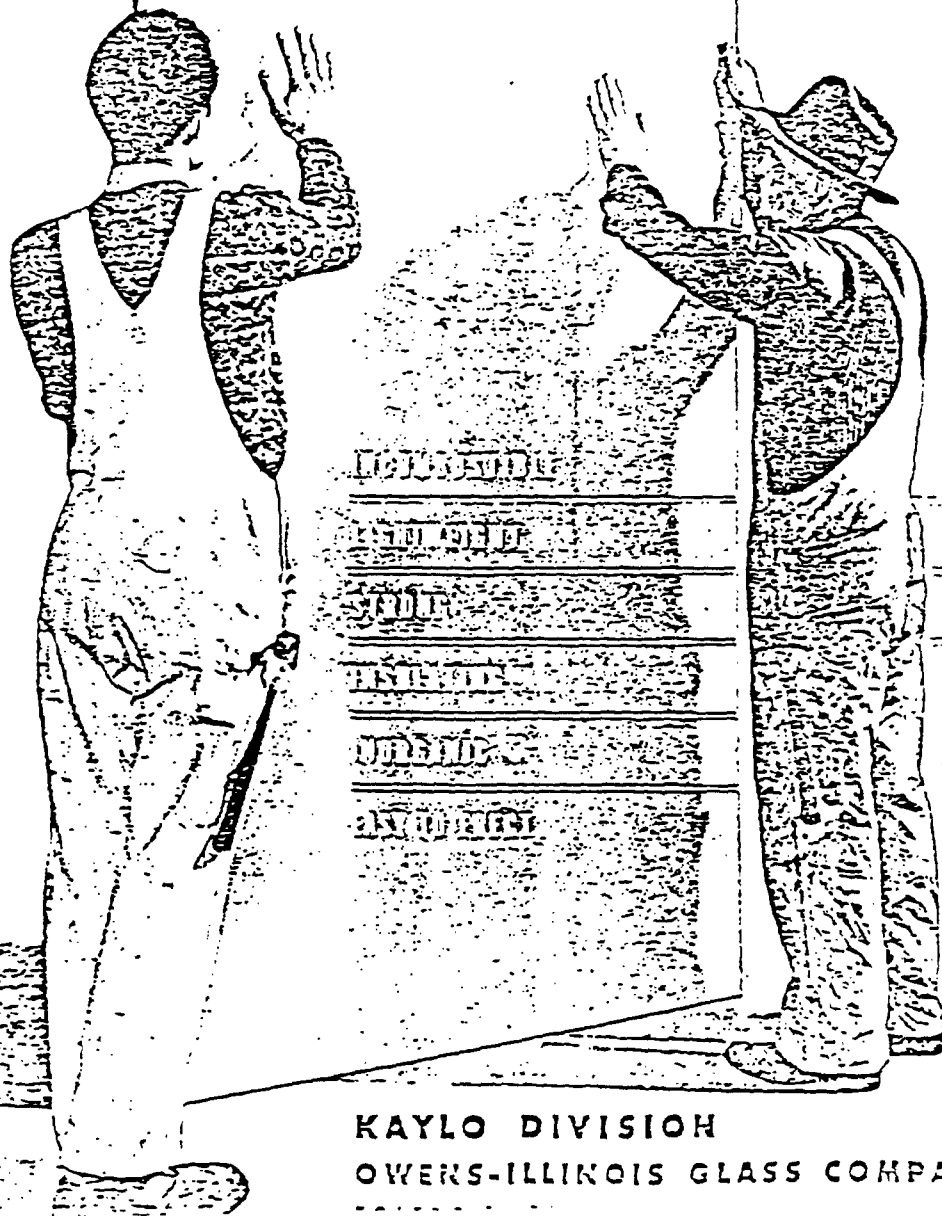
Sales Offices

ATLANTA • BOSTON • BUFFALO • CINCINNATI • CHICAGO
DALLAS • MINNEAPOLIS • NEW YORK • PHILADELPHIA

NEW KAYLO®

LAMINATED PANELS

WITH CEMENT-ASBESTOS FACING



KAYLO DIVISION

OWENS-ILLINOIS GLASS COMPANY

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General description	Pages 2-5
Technical data	Pages 6-7
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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:

Manufacturing buildings
Warehouses
Utility buildings

COMMERCIAL:

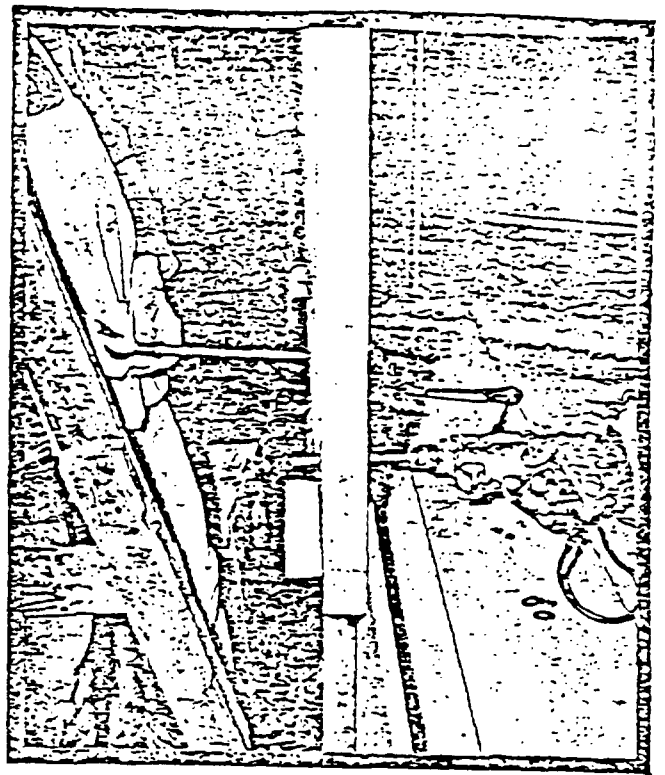
Stores
Warehouses
Garages
Office buildings
Field stations

PUBLIC:

Schools
Hospitals
Depots



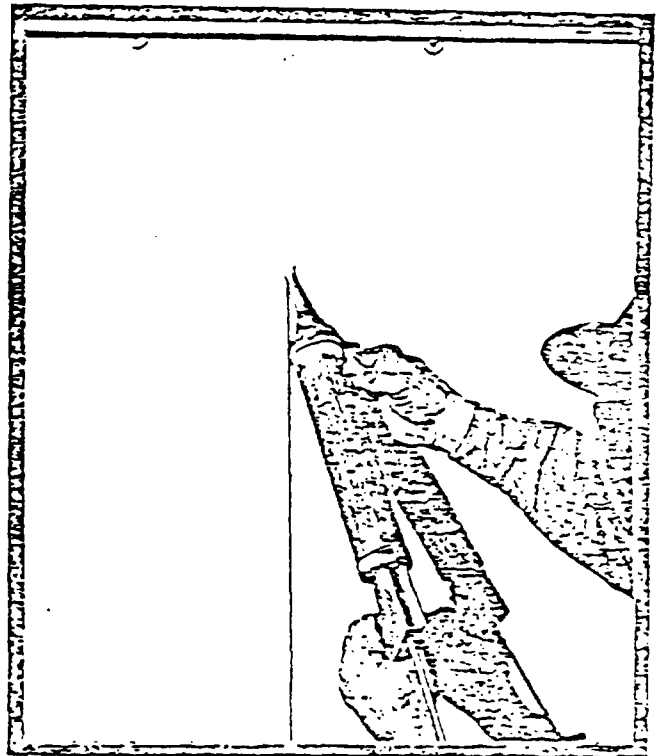
Workmen set panel into place.



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

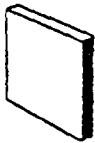
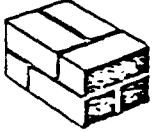
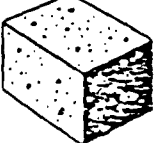
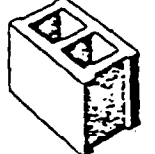
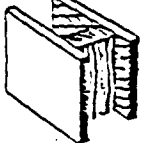
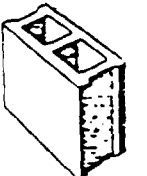
Kaylo Laminated Panels with cement-asbestos facing are nominally two inches thick. The Kaylo core is nominally 1½" thick and each face veneer is ¼" thick. Cement-asbestos faces are laminated to the core with a waterproof adhesive. Panel edges are protected by a weatherproof coating. The standard panel size is 4 feet x 8 feet. Other sizes are available on special order.

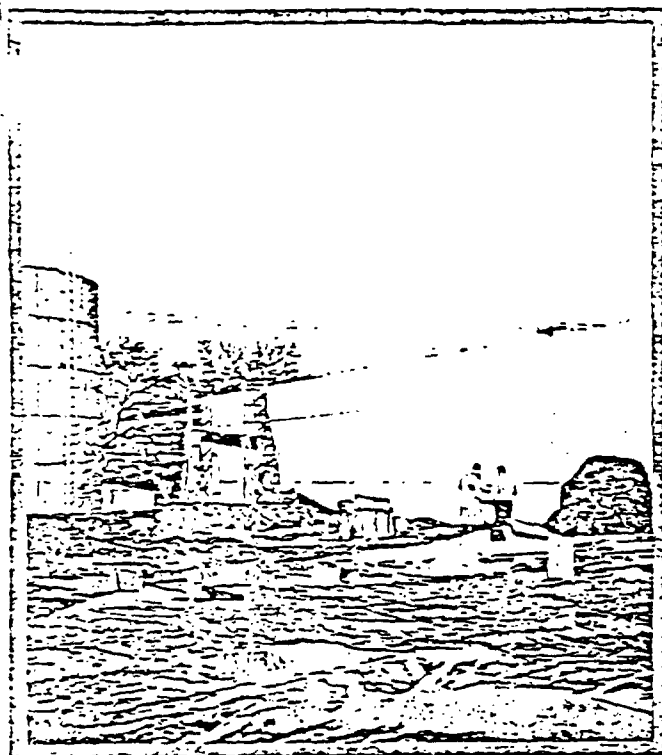
Complete technical data, including physical characteristics and typical construction details, are shown on the following pages.

WEIGHT AND INSULATING VALUE

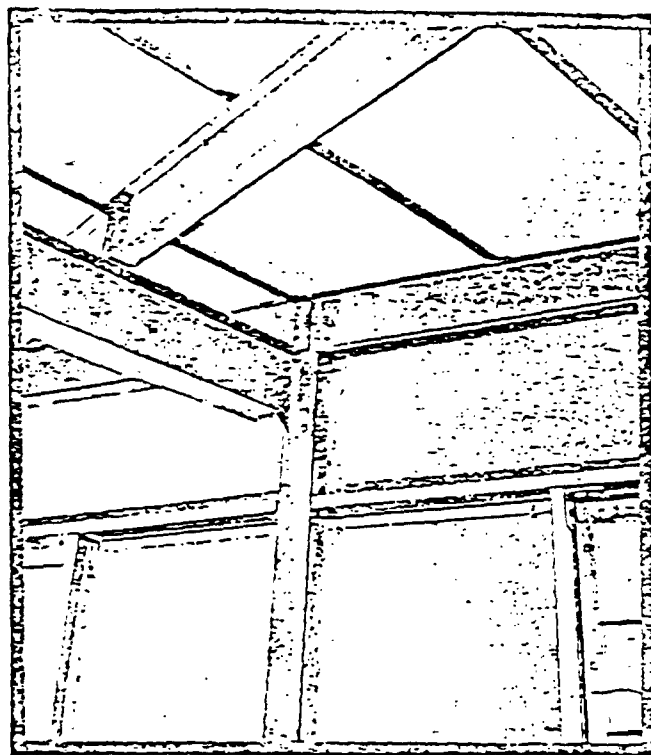
KAYLO

LAMINATED PANELS COMPARED TO OTHER WALLS

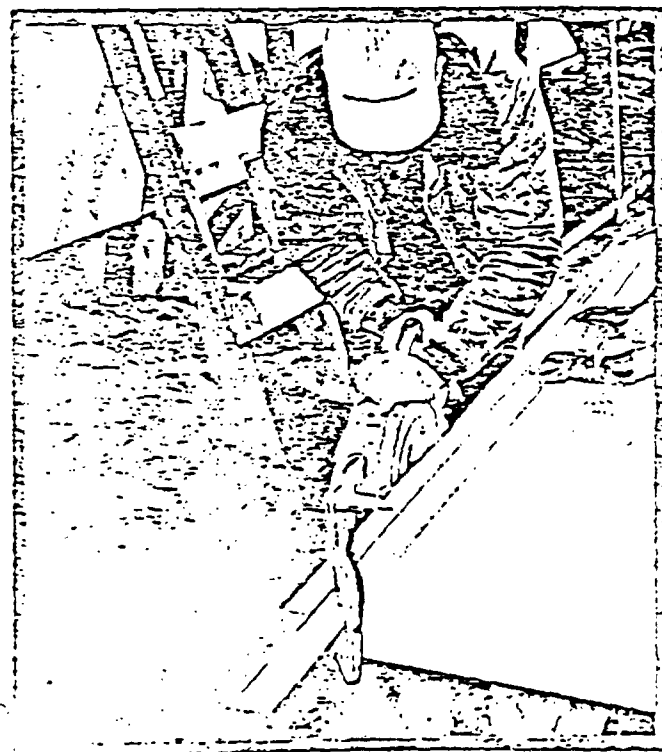
		U-FACTOR (Btu./sq. ft./hr./°F.)	WEIGHT (lb./sq. ft.)
2" KAYLO LAMINATED. PANELS WITH CEMENT- ASBESTOS FACING		.30	6¼
8" SOLID BRICK		.50	84
12" CONCRETE		.57	144
8" HOLLOW CINDER BLOCK		.42	30
2" CEMENT PLASTER ON CHANNEL STUDS AND METAL LATH		INSIDE PARTITION	17½
5" WALL ½ PLASTER BOTH SIDES ON 2X4 STUDS AND METAL LATH		INSIDE PARTITION	18
4" HOLLOW TILE		INSIDE PARTITION	13



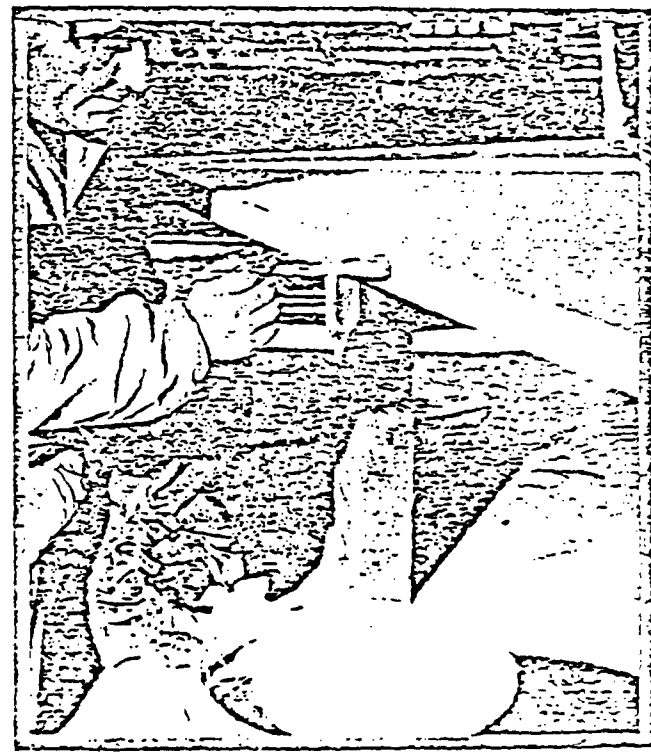
*Kaylo Laminated Panels provide a neat
side wall, resistant to fire and weather.*



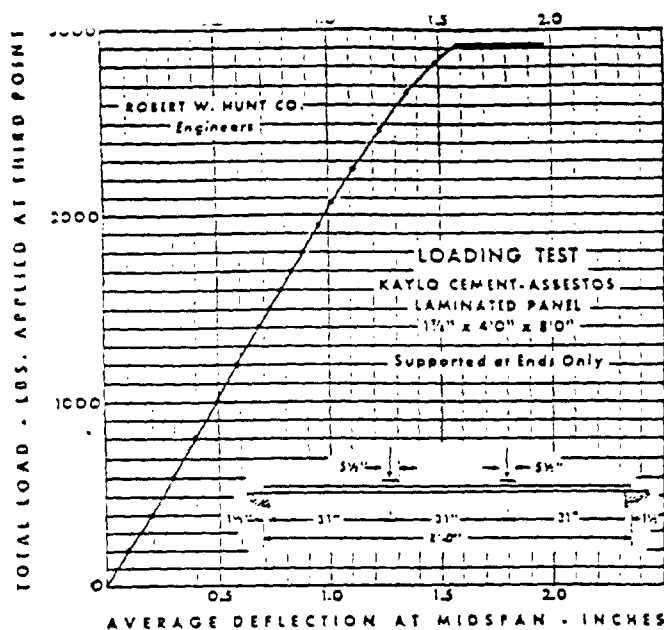
*Inside of wall provides clean, light-reflective sur-
face. Kaylo Roof Deck makes attractive ceiling.*



*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.*



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 $\frac{1}{4}$ ". When the weight was removed, the panel returned to its original

TECHNICAL DATA.

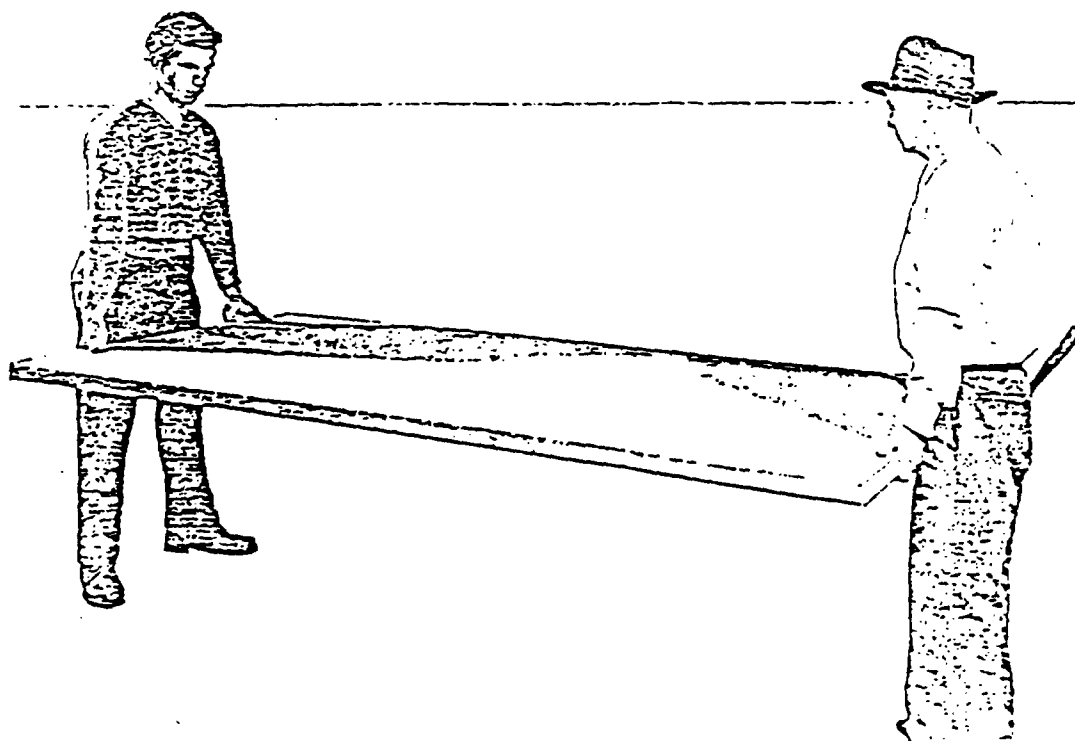
position. From the load-deflection curve, at the left, is obvious that the panel supported on a 7'-9" span can withstand many times the required design windload without exceeding its elastic limit.

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.



INSULATION VALUE

The U-factor of a panel $1\frac{1}{4}$ " 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 127 to 2070 averaged 35 decibels. The reduction between frequencies of 1161 to 2070 averaged 42 decibels.



VAPOR TRANSMISSION

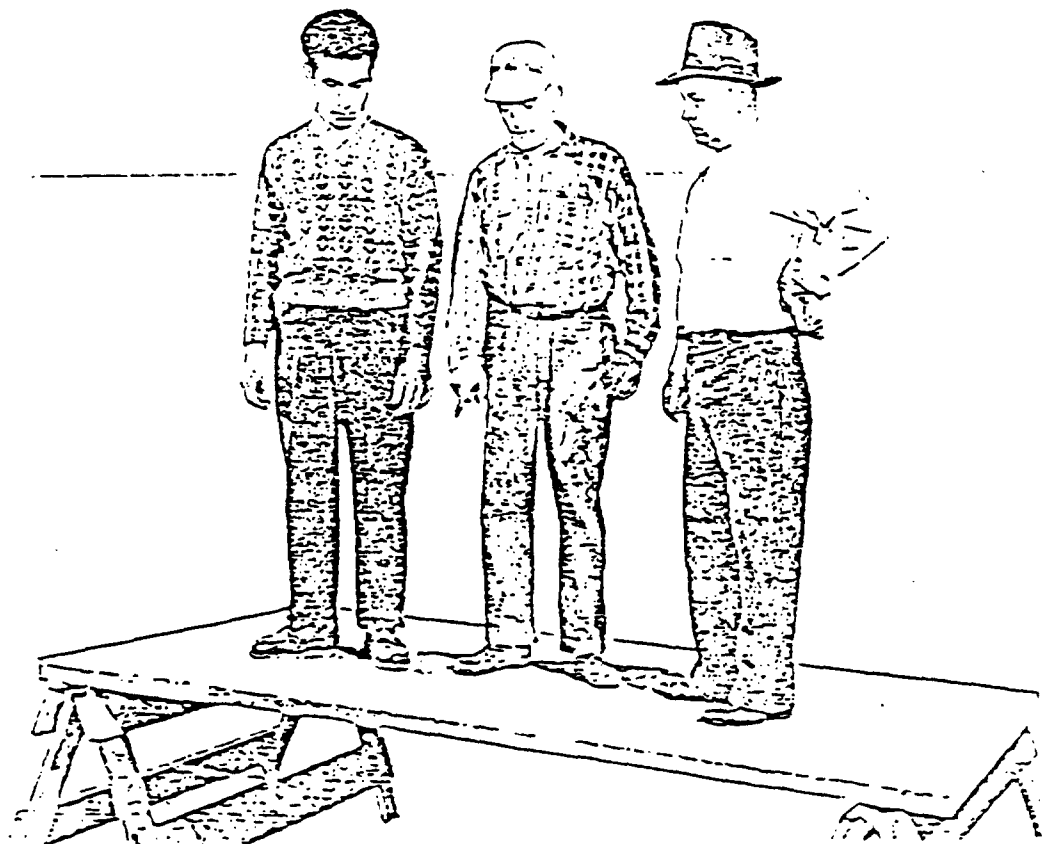
Adding materials, to be considered good vapor barriers, are expected to have average vapor transmission rates

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.



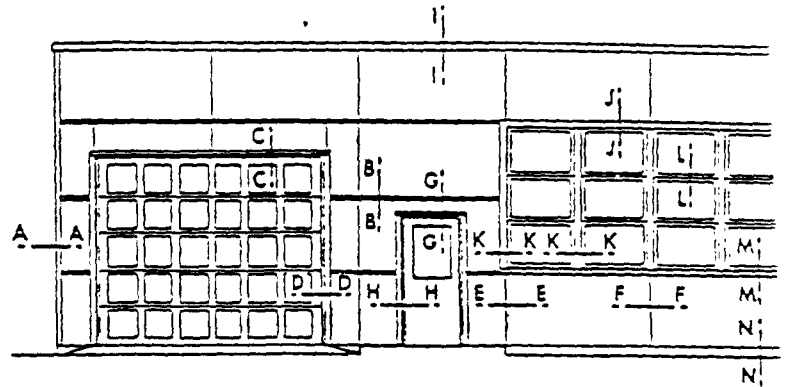
TYPICAL DETAILS

KAYLO

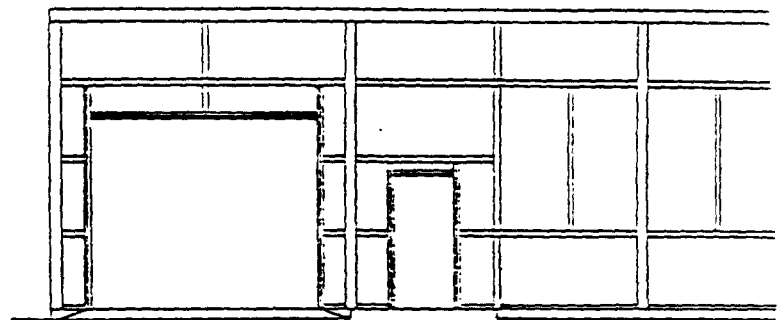


WOOD FRAMING

Scale 1½" = 1'-0"

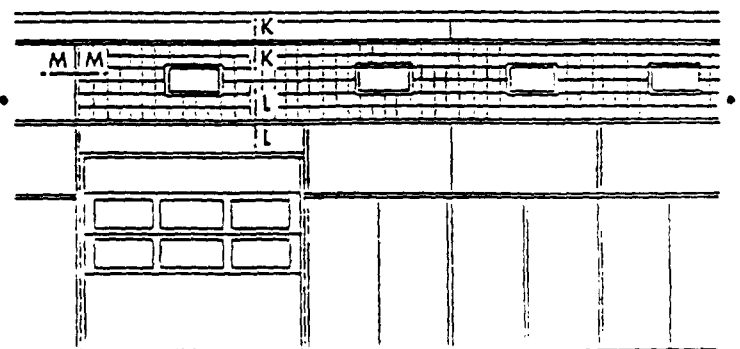


ELEVATION



ELEVATION - FRAMING

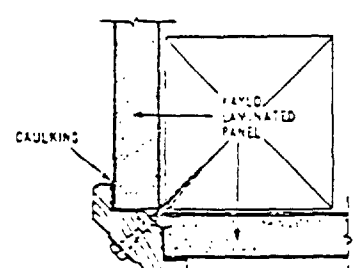
USING GLASS BLOCK WITH
KAYLO LAMINATED PANELS



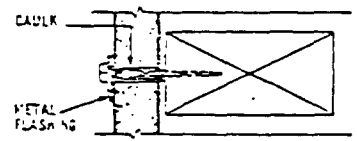
..... LAMINATED PANELS

CEMENT-ASBESTOS

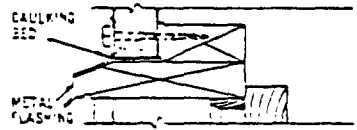
FACING



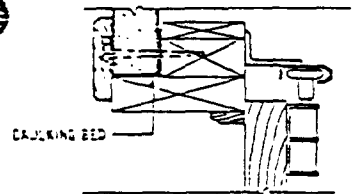
Detail "A-A"



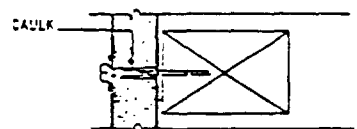
Detail "B-B"



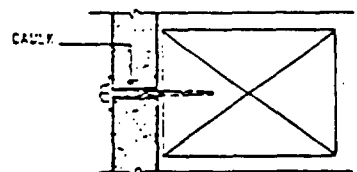
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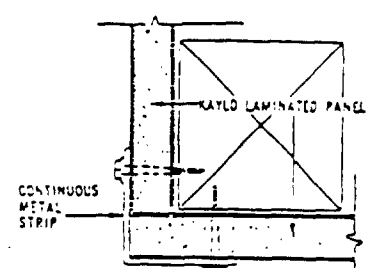
Detail "D-D"



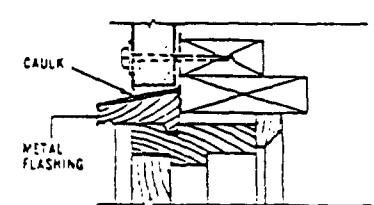
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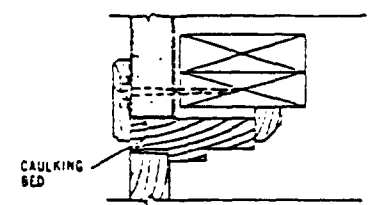
Detail "F-F"



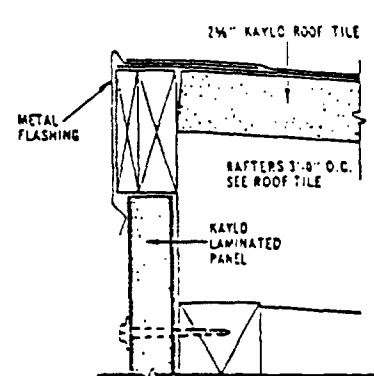
Alt. Det. "A-A"



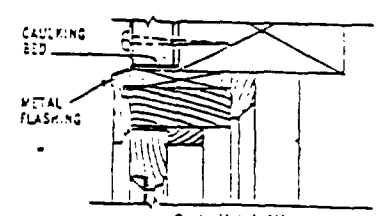
Detail "G-G"



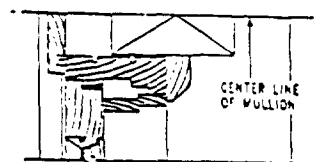
Detail "H-H"



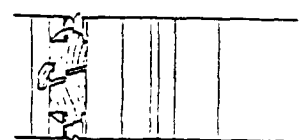
Detail "I-I"



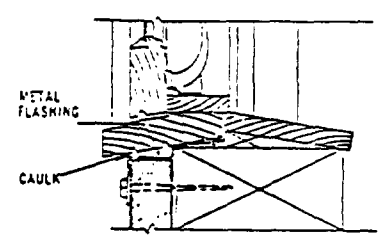
Detail "J-J"



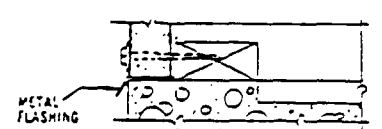
Detail "K-K"



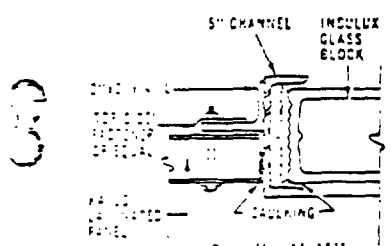
Detail "L-L"



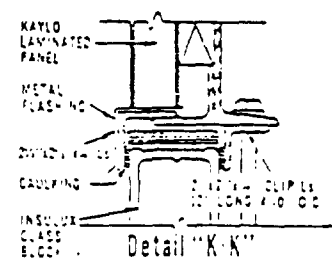
Detail "M-M"



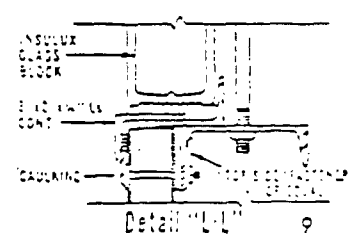
Detail "N-N"



Detail "M-M"



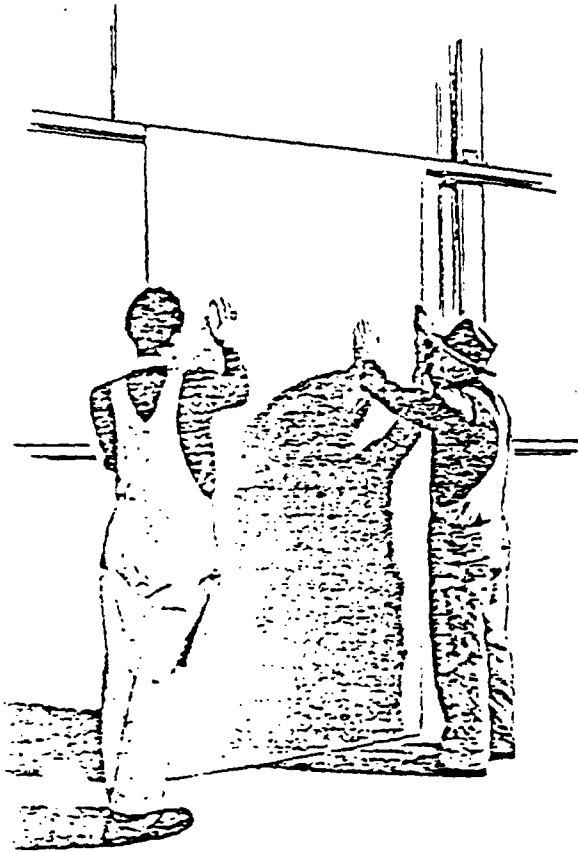
Detail "K-K"



Detail "L-L"

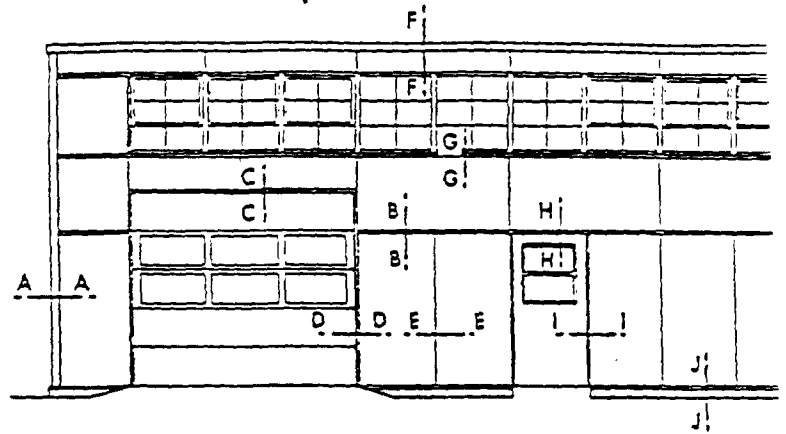
TYPICAL DETAILS

KAYLO

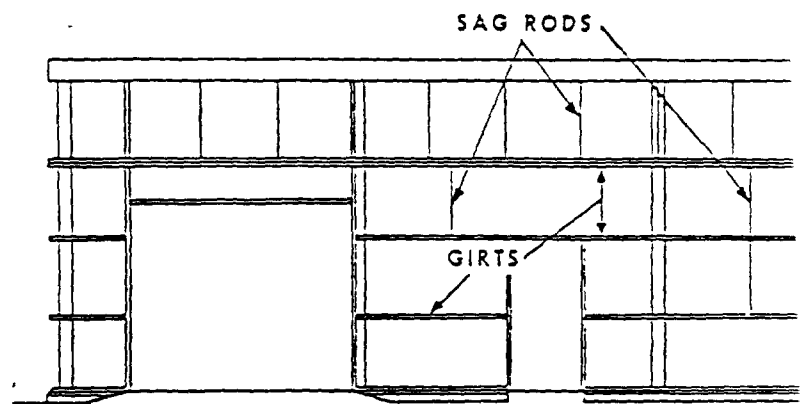


STEEL FRAMING

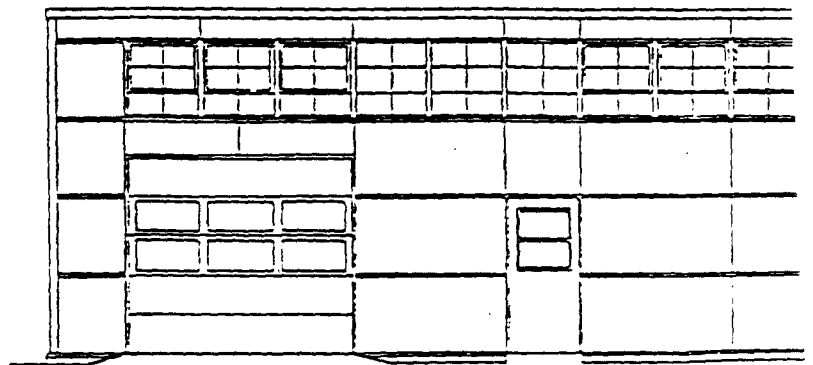
Scale $1\frac{1}{2}'' = 1'-0''$



ELEVATION - VERTICAL PANELS



ELEVATION - FRAMING

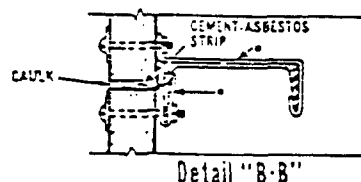
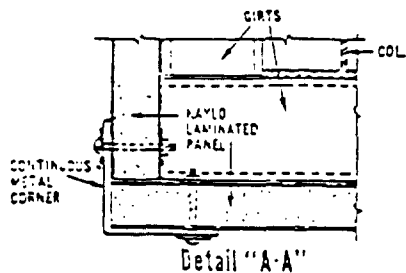


ELEVATION - HORIZONTAL PANELS

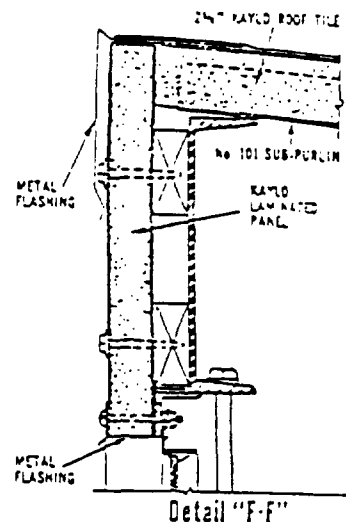
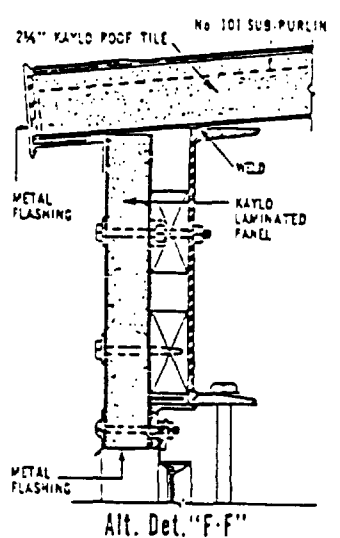
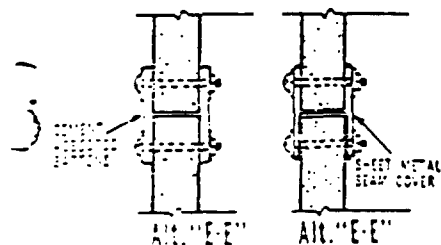
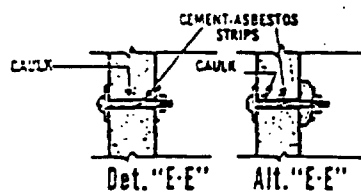
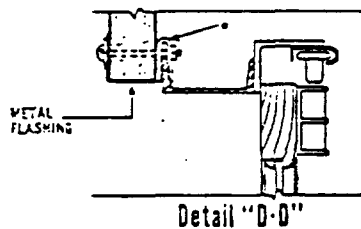
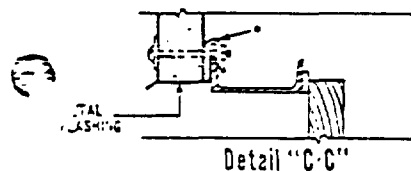
..... LAMINATED PANELS

CEMENT-ASBESTOS

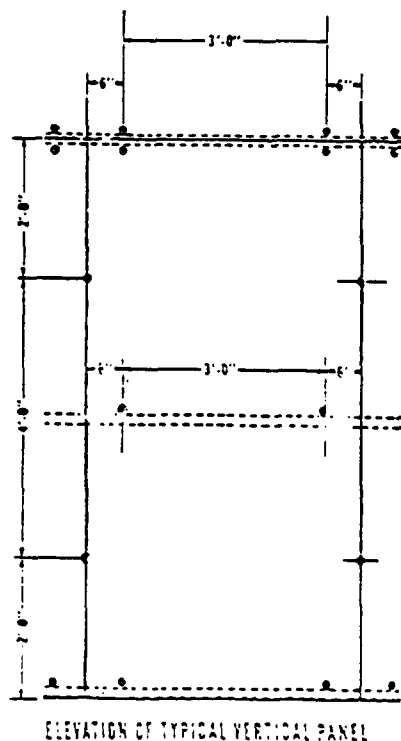
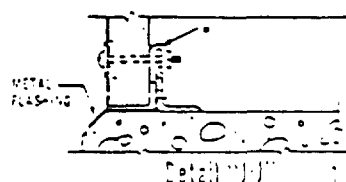
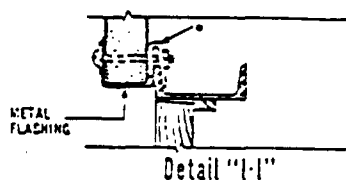
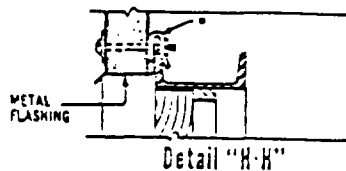
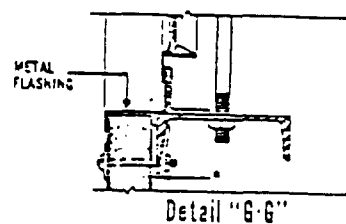
FACING

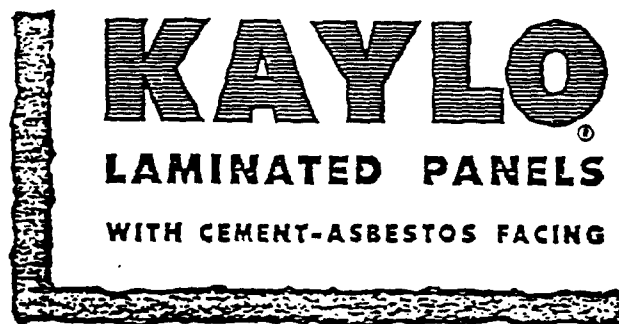


Note: Detail "B-B" | Special Flashing Required When Vertical Butt-Joints Are Listed



***"Top Side" Fasteners by
H. & B. Enterprise Corp.
Trenton, New Jersey
or approved equal

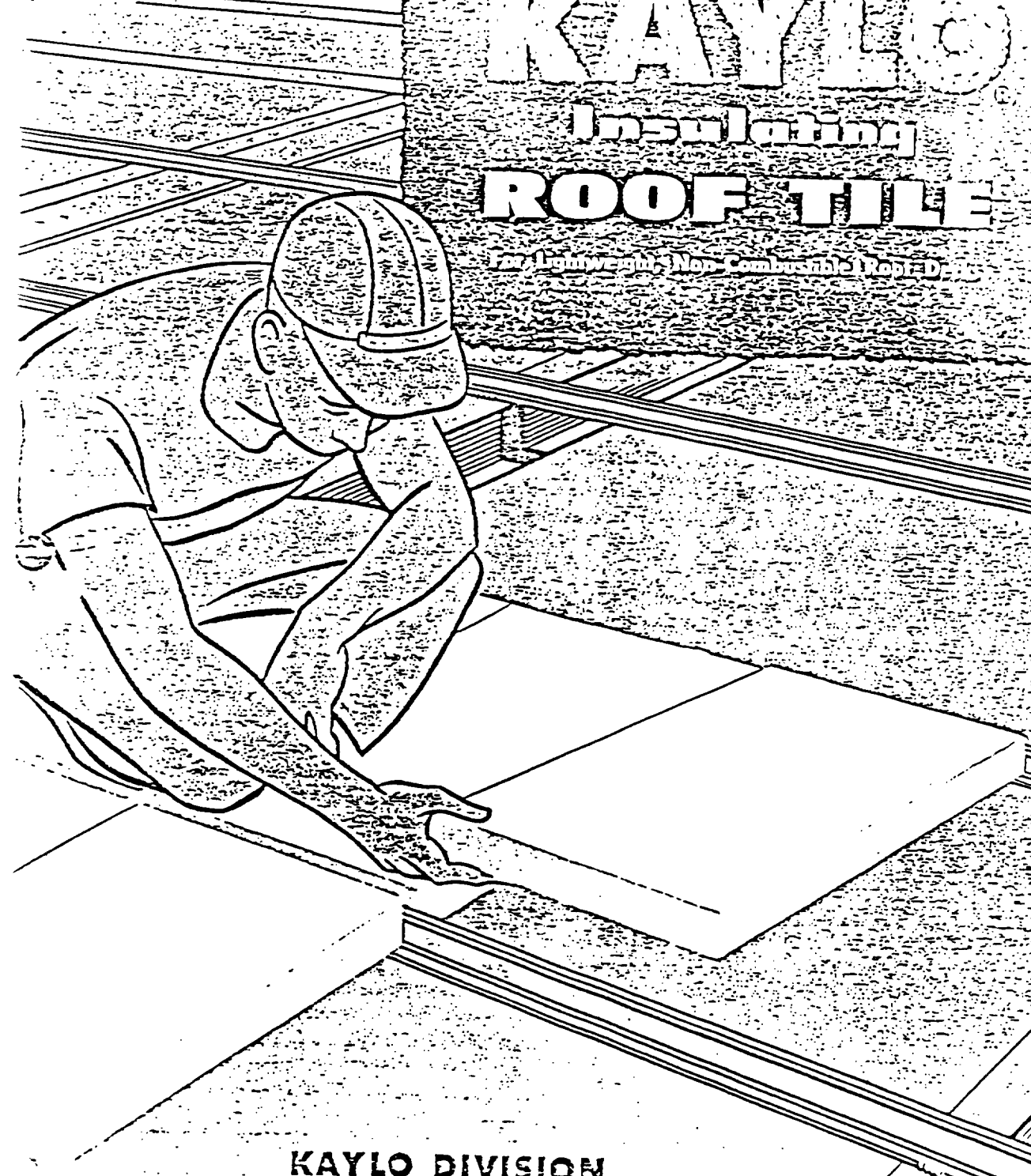




Kaylo Division

OWENS-ILLINOIS GLASS COMPANY

TOLEDO 1, OHIO



KAYLO

Insulating

ROOF TILE

For Lightweight Non-Combustible Roofs

KAYLO DIVISION
OWENS-ILLINOIS GLASS COMPANY
TOLEDO 1, OHIO

TABLE OF CONTENTS

General product description	2 and 3
Specifications and design data for use with rail sub-purlin	4
Construction details for use with rail sub-purlin	5
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Typical construction details	8
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Photographs	10 and 11

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 a 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 24" x 15 x 36 inches. It is white, or whitish in appearance and is entirely of a non-combustible mineral base which is predominantly 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 Owens-Illinois Glass Company 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. 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 22 pounds per tile (having an area of four and one-half square feet).

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 Owens-Illinois Glass Company 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, 2 3/4 inches thick by 18 inches wide by 36 inches long as made by Owens-Illinois Glass Company.

3. Anchors. Anchors are not required with Owens-Illinois Glass Company sub-purlins No. 101.

4. Grout. Grout for end joints of tile shall be composed of the following materials, measured by volume:

	Ratio	Batch Volume
Setting plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7 1/2 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 2 3/4 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, No. 101 sub-purlin shall be accurately spaced 3 feet 1 inch on centers.

Sub-purlins shall be welded to each support with one fillet weld 1/2 inch long placed on alternate sides of sub-purlins. At ends of sub-purlins place welds on both sides. 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.

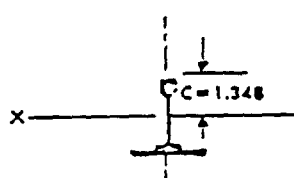
2. Kaylo Roof Tile. Kaylo Roof Tile shall be spaced evenly on sub-purlins to provide a minimum end bearing of 1/2 inch. Tiles shall be butted tightly together at sides. Cut tile to fit at ridge hips, valleys, parapets, curbs, walls, around vents, pipes, etc. as grout in place.

Where necessary to cut standard pieces for fitting, any bar or power saw which will cut the wire mesh is suitable.

3. Grout. Joints at ends of tile over sub-purlins, and at ridge 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 anchor against uplift pressure.

Grout shall be poured from an open-spout can into joint 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	1x-x In. 4
	2-1/4" x 2-3/8"	Lb./L.F. 3.2	3'-1" On Centers	.690

	Total Load (Per Sq. Ft.)	Clear Span*		Deflection	
		f=20,000	f=18,000	f=20,000	f=18,000
Southern States & Pacific Slope	32 lb.	9'-4"	8'-11"	.454	.370
Central States	42 lb.	8'-3"	7'-9"	.358	.279
Rocky Mountain States	49 lb.	7'-7"	7'-3"	.310	.248
Northwest States	57 lb.	7'-0"	6'-8"	.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.

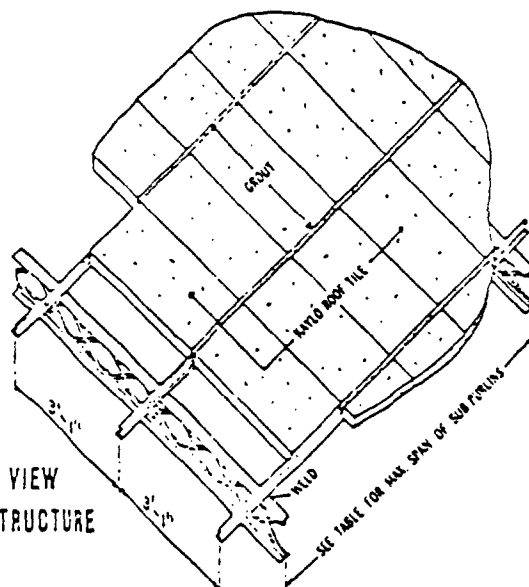
Rocky Mountains and

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.



ISOMETRIC VIEW
OF ROOF STRUCTURE

HALF SIX



Scale $\frac{3}{4}" = 1'$
Except as not.

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, 2 1/4 inches thick by 18 inches wide by 36 inches long as made by Owens-Illinois Glass 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 1 1/2" x 1 1/2" 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, hot-dip galvanized.

d. Nails (for Stran-Steel)

Nails for fastening Kaylo Roof Tile to Stran-Steel shall be 12d box x 3" long, hot-dip galvanized.

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	7 1/2 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 2 1/4 inches thick by 18 inches 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 other. They shall be accurately spaced 3'-0 1/2" 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 1/2 inch. Tile shall be butted tight together at sides. Cut tile to fit at ridges, hips, valleys, parapet 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 1 1/4". The heads of the nails shall project above the Stran-Steel a minimum of 1 1/4".

dd. Staples (for Stran-Steel)

Staples shall be spaced 3" on centers and driven into Stran-Steel a minimum of 1 1/4". Staples shall project above Stran-Steel a minimum of 1 1/4".

4. Grout.

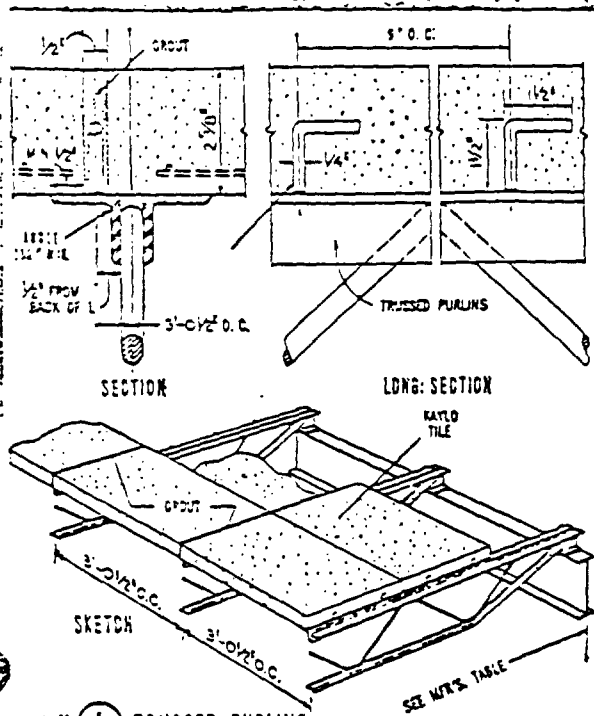
Joints at ends of tile over purlins or joists, and at ridges and hips, shall be filled with grout mixed as specified. The grout shall completely fill the joint over the purlins so that the (bent studs) (nails) (staples) are entirely encased in grout to provide anchorage against uplift pressure.

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.

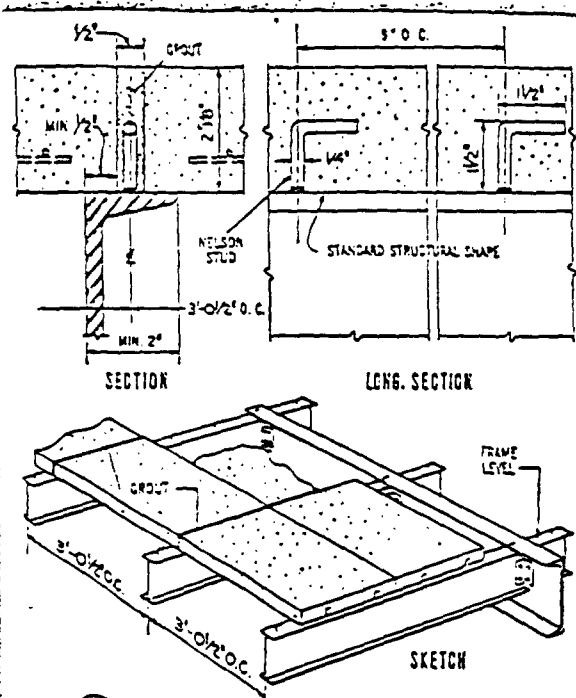
5. Saddles.

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.

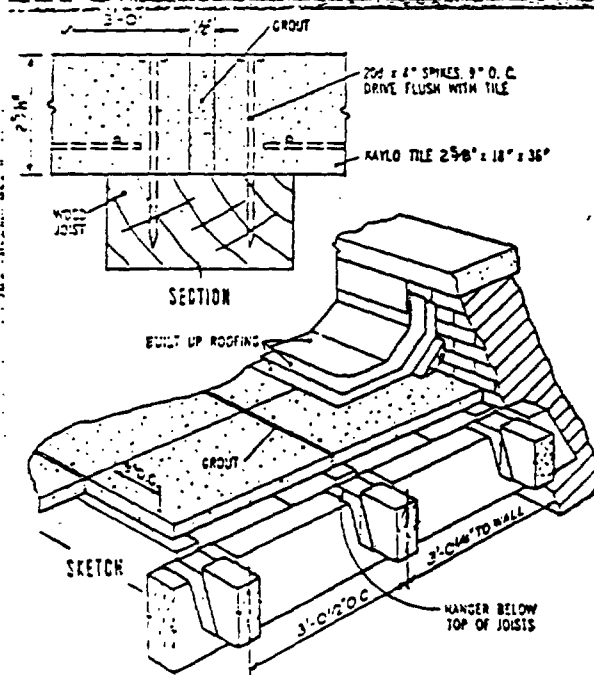
ROOFS KAYLO ROOF TILE



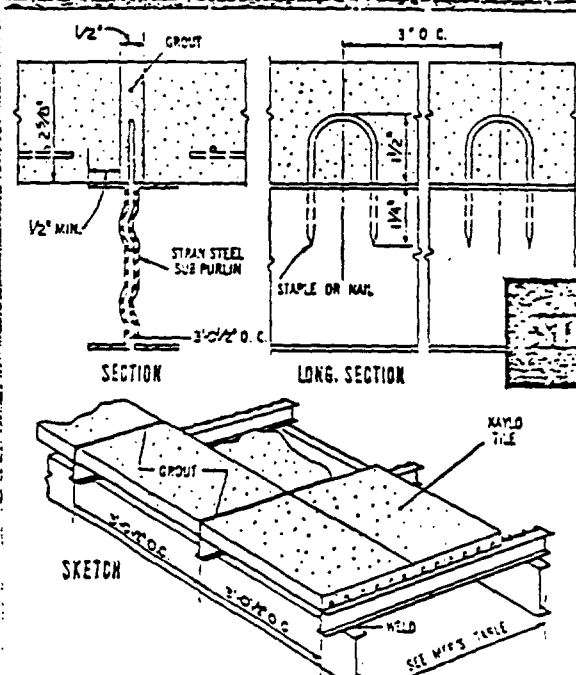
Detail **A** TRUSSED PURLINS



Detail **B** STANDARD STRUCT. SHAPES

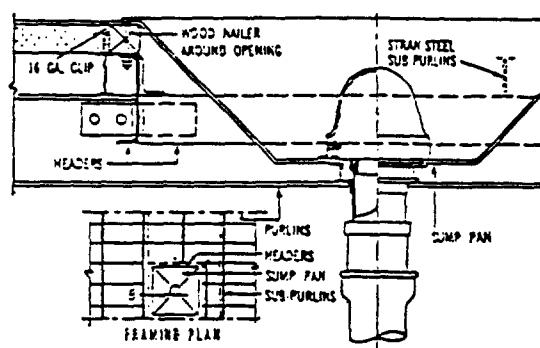
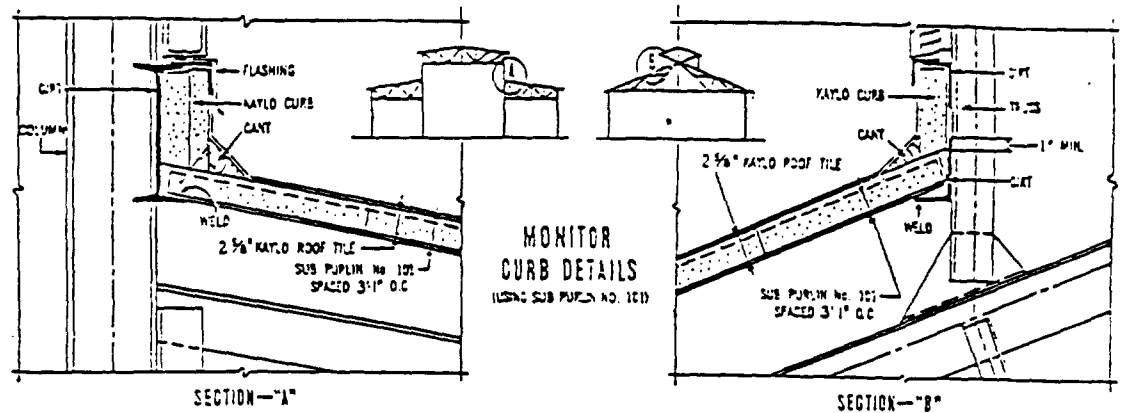


Detail **C** SLOW BURNING CONST.

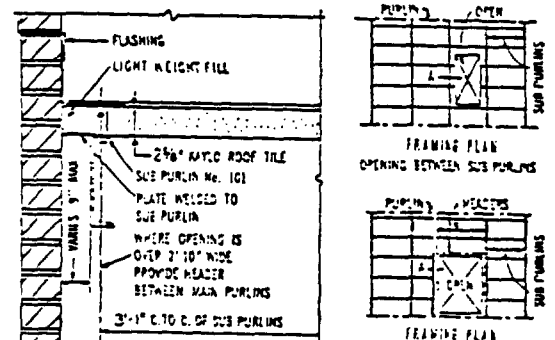


Detail **D** STRAN-STEEL SUB-PURLINS

Scale 3" = 1'-0"
Except as note



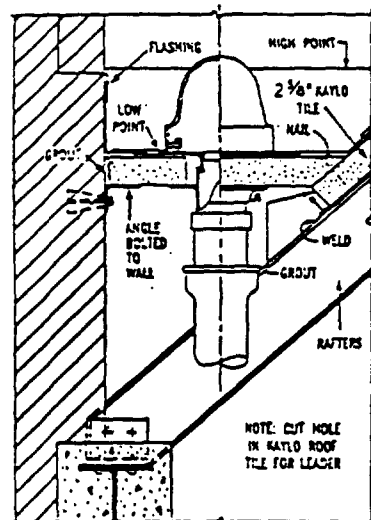
SECTION—"B"
FRAMING FOR SUMP PAN
(USING STRAIN STEEL SUB-PURLINS)



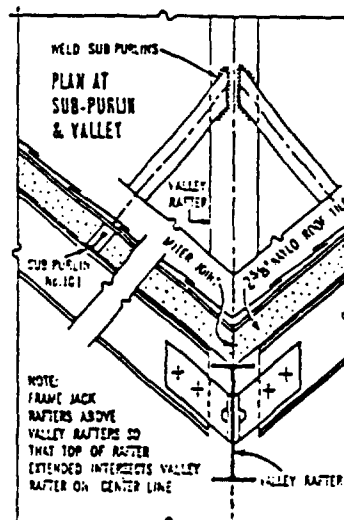
SECTION—"A"
FRAMING AROUND OPENINGS
(USING SUB PURLIN No. 101)

PICTURE DETAILS

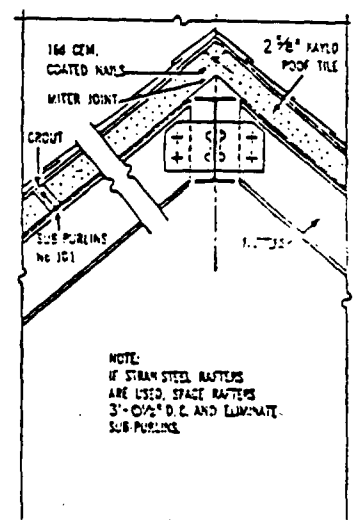
Scale 3/4" = 1'-0"
except as noted



PARAPET DETAIL
(SHOWING ROOF DRAIN)



VALLEY DETAIL



RIDGE DETAIL

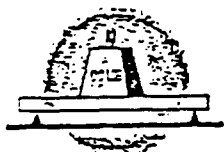
DETAILS FOR STEEP PITCHED ROOFS—RAFTER FRAMING

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



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.).....	22.0



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

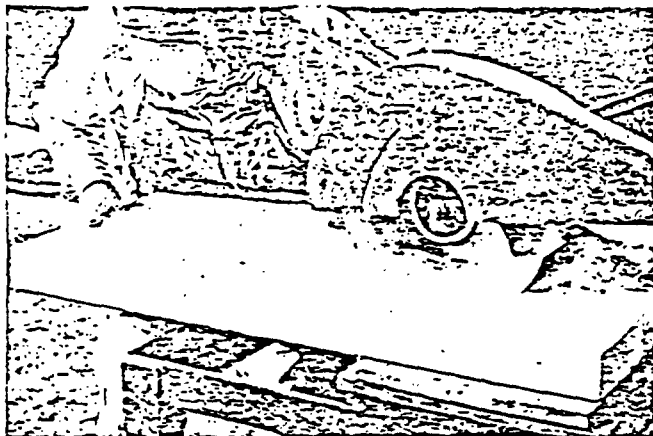
LENGTH OF NAILS	DRIVE			CUT		GALVANIZED ROOFING		NON-GALV. ROOFING WITH WASHER		STAPLES		ES	COPPER SLATING	
Diam. Nails, in.	.12	.13	.14	.15	.12	.18	.14	.13	.13	.10	.08	.08	.15	.13
Total Pull, Lb./In. Penetration	11	9	26	13	54	74	44	12	13	24	57	45	55	19



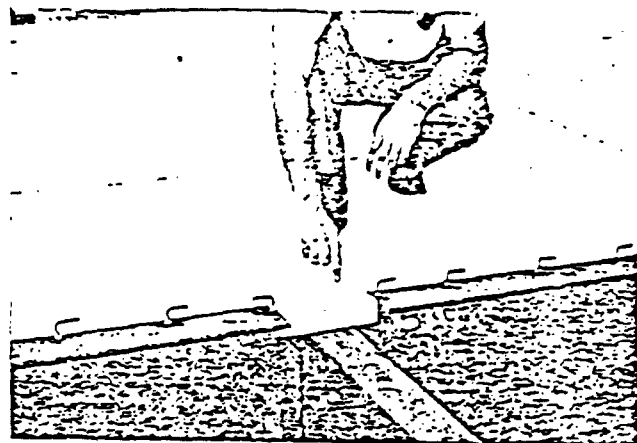
LIGHT REFLECTIVITY

Light reflectivity of Kaylo Roof Tile is approximately 80%.

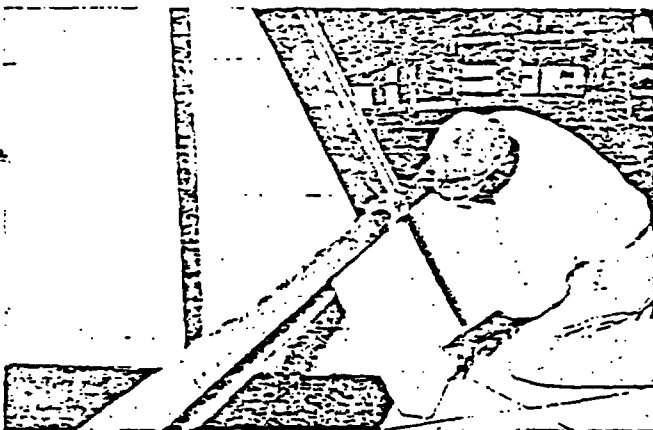
INSTALLATION KAYLO ROOF TILE



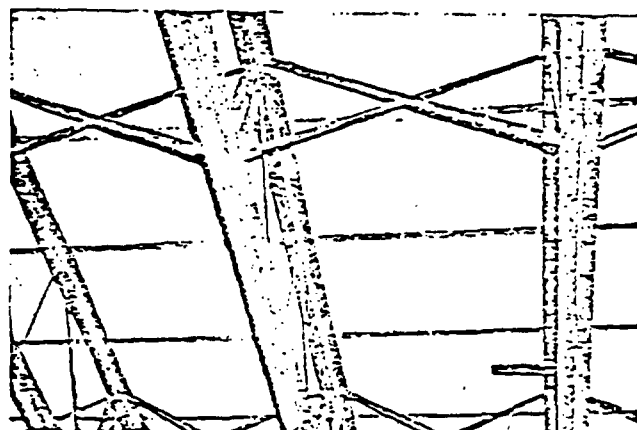
Cutting Kaylo Roof Tile to fit odd spaces is easily accomplished with power or handsaw. Tile can also be cut or gouged with a knife to fit over rivet heads.



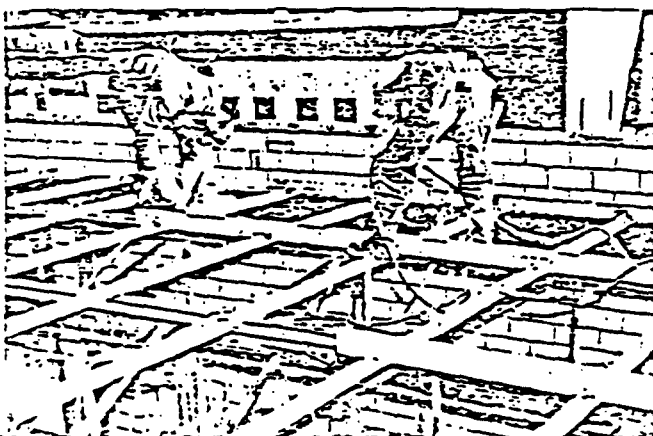
Nelson Studs can be used to form anchors in spots where tiles are supported by structural members.



Fitting Kaylo Roof Tile to skylight. Cutting can be done with ordinary hand tools such as a hatchet.



Underside of Kaylo Roof Deck forms a completed ceiling, without treatment or painting. It reflects light, raises illumination levels, as shown above.



Welding rail sub-purlin No. 101. Note templates or jigs to space purlins accurately between centers.



Final Step is the simple task of applying standard built-up roofing. Erecting a Kaylo Roof Deck is remarkably easy, all the way.



American Structural Products Company
Toledo, Ohio

SUBSIDIARY OF OWENS-ILLINOIS GLASS COMPANY

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Specifications and design data for use with hollow box sub-purlin.....	4
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Construction details for use with rail sub-purlin.....	7
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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.

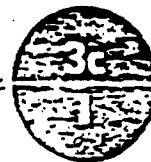
Thus it is now possible to design a deck made with a non-combustible tile so that the dead load above the main purlins, including an excellent built-up roofing, is about twelve pounds per square foot of roof area.

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 flexure 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 commends itself to every architect and engineer who has a 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 24 x 18 x 36 inches. It is white, or whitish in appearance and is made entirely of a non-combustible mineral base which is predominantly 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

Kaylo Roof Tile and Sub-Purlin No. 102

102

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, 2 1/4 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:

	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	7 1/2 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 2 1/4 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, 1/4 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 1/4-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 1/2 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.

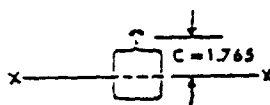
Where necessary to cut standard pieces for fitting, any hand or power saw which will cut the wire mesh is suitable.

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	1x-x in. 4	1y-y in. 4	5x-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 Flat to 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.

Build-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.

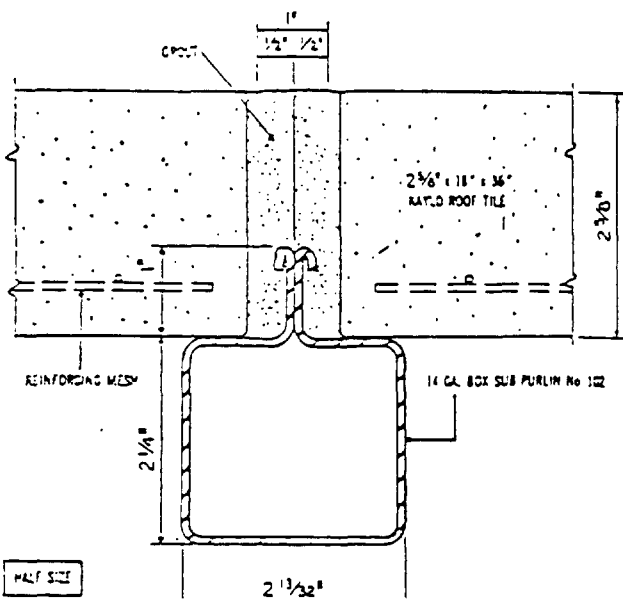
Rocky Mountains and

N. E. States..... 37 lb. per sq. ft.

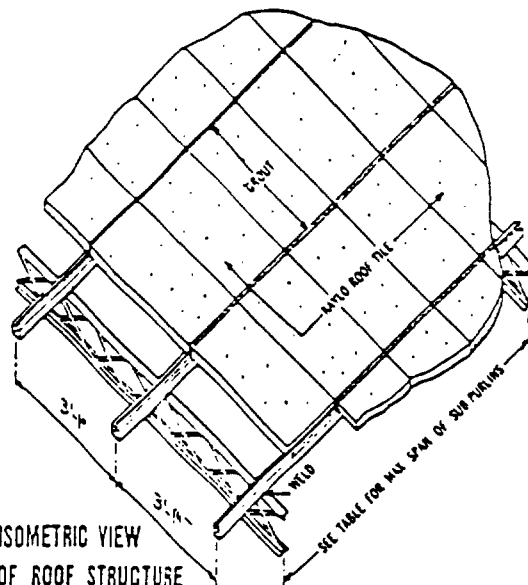
Northwest States..... 45 lb. per sq. ft.

M = W/10

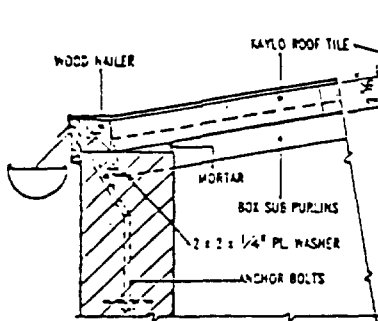
* Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bending occurs, reduce span.



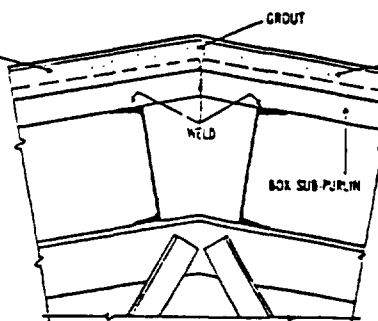
SECTION THROUGH JOINT



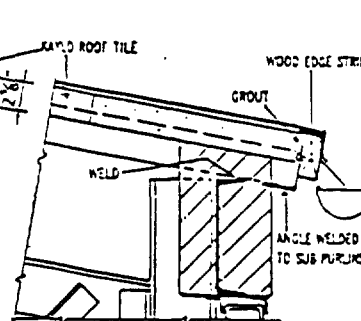
ISOMETRIC VIEW
OF ROOF STRUCTURE



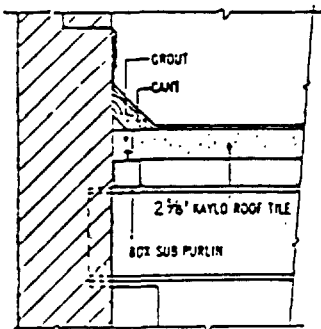
EAVE SECTION
WALL BEARING



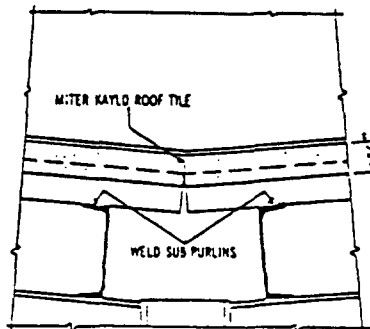
RIDGE SECTION



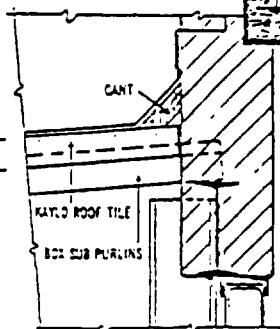
EAVE SECTION
SKELETON FRAME



PARAPET SECTION
SUB PURLIN PARALLEL TO WALL



VALLEY SECTION



PARAPET SECTION
SUB PURLIN PERPENDICULAR TO WALL



Scale 3/4" = 1'
Except as not

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.

INSTALLATION

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, 2 3/8 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:

	Ratio	Batch Volume
ugging plaster (quick-setting)	1.0	1 cu. ft.
Expanded vermiculite (vermiculite plastering aggregate)	0.6	0.6 cu. ft.
Water (approximate)	1.0	7 1/2 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 2 3/8 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.

1. Sub-purlins. To receive Kaylo Roof Tile, American Structural Products rail sub-purlins No. 101 shall be accurately spaced 3'-1 1/4" on centers.

Sub-purlins shall be welded to each support with one full weld, 5/8 inch long placed on alternate sides of sub-purlin. Where joints of sub-purlins do not occur over supports, the 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.

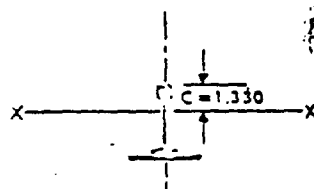
2. Kaylo Roof Tile. Kaylo Roof Tile shall be spaced evenly on sub-purlins to provide a minimum end bearing of 1/4 inch, with that side up which is marked "top." Tile shall be butted tight together at sides. Cut tile to fit at ridges, valleys, parapets, curbs, walls, around vents, pipes, etc. and grout 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 ridge and hips, shall be filled with grout mixed as specified. When 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		Iy-y		Sx-x	
	Lb./LF.	Lb./S.F. of Roof		In. 4	In. 4	In. 4	In. 4	In. 3	In. 3
2'-1 1/4" x 2'-3 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
Mountain & N.E. States	49 lb.	7'-9"	7'-4"	.310	.246
Northwest States	57 lb.	7'-2"	6'-9"	.258	.208

Assumed dead load, per square foot of roof:

Kaylo tile and sub-purlins . . . 60 lb.

Built-up roofing
(tar and gravel) 60 lb.

Total dead load 120 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.

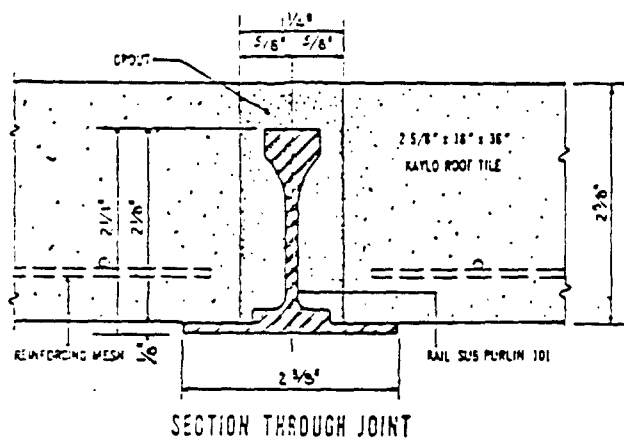
Northwest States . . . 45 lb. per sq. ft.

M = W/1

10

*Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bending occurs, reduce span.

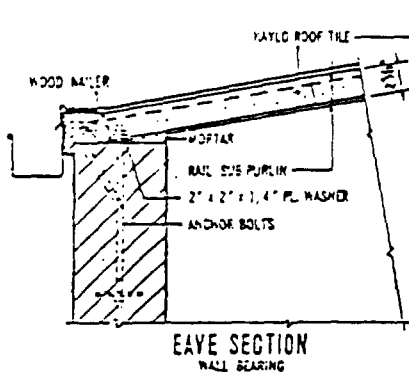
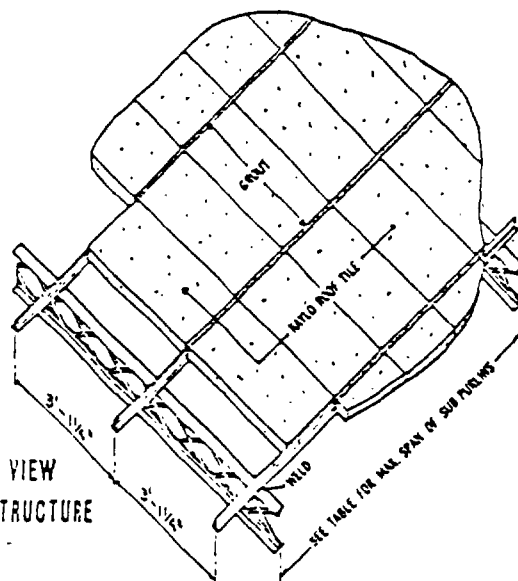
RAILS RAYLO ROOF TILE



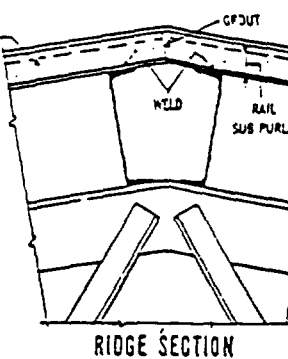
SECTION THROUGH JOINT

HALF SIZE

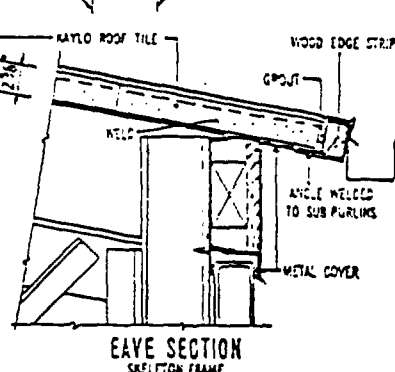
ISOMETRIC VIEW
OF ROOF STRUCTURE



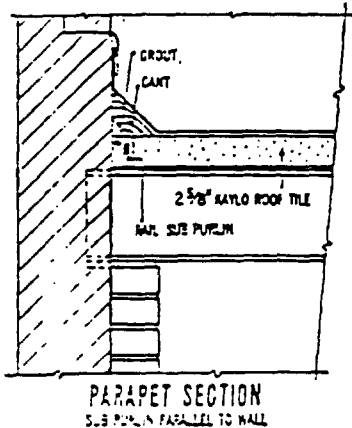
EAVE SECTION
WALL BEARING



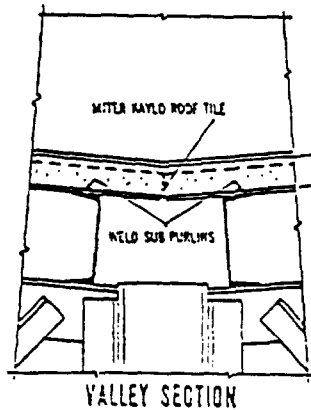
RIDGE SECTION



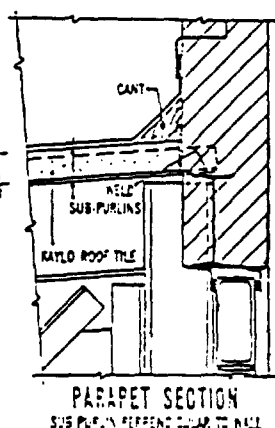
EAVE SECTION
SKELETON FRAME



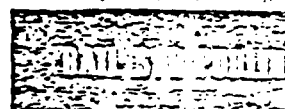
PARAPET SECTION
SUB PURLIN PARALLEL TO WALL



VALLEY SECTION



PARAPET SECTION
SUB PURLIN PERPENDICULAR TO WALL



Scale 3/4" = 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, 2 $\frac{3}{4}$ 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 1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " 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 10d 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	7 $\frac{1}{2}$ 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.

Insulating Roof Tile 2 $\frac{3}{4}$ inches thick by 18 inches 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'-0 $\frac{1}{2}$ " 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 $\frac{1}{2}$ 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 1 $\frac{1}{4}$ ". The heads of the nails shall project above the Stran-Steel a minimum of 1 $\frac{1}{2}$ ".

dd. Staples (for Stran-Steel)

Staples shall be spaced 3" on centers and driven into Stran-Steel a minimum of 1 $\frac{1}{4}$ ". Staples shall project above Stran-Steel a minimum of 1 $\frac{1}{2}$ ".

4. Grout.

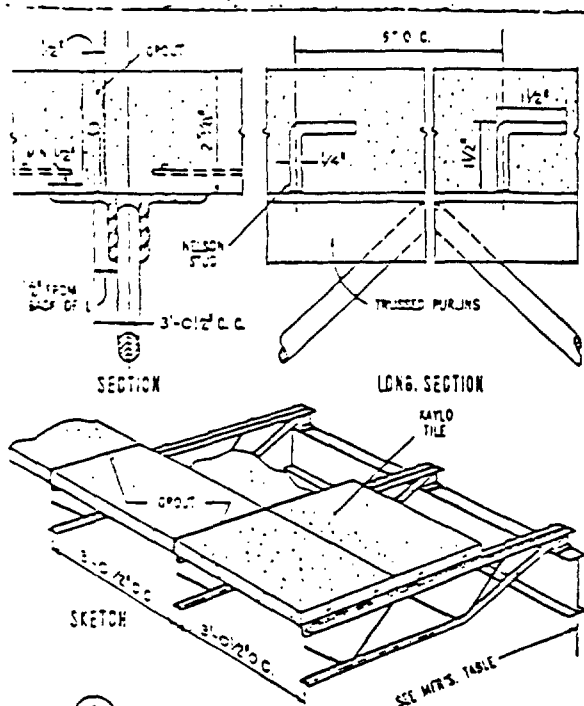
Joints at ends of tile over purlins or joists, and at ridges and hips, shall be filled with grout mixed as specified. The grout shall completely fill the joint over the purlins so that the (bent studs) (nails) (staples) are entirely encased in grout to provide anchorage against uplift pressure.

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.

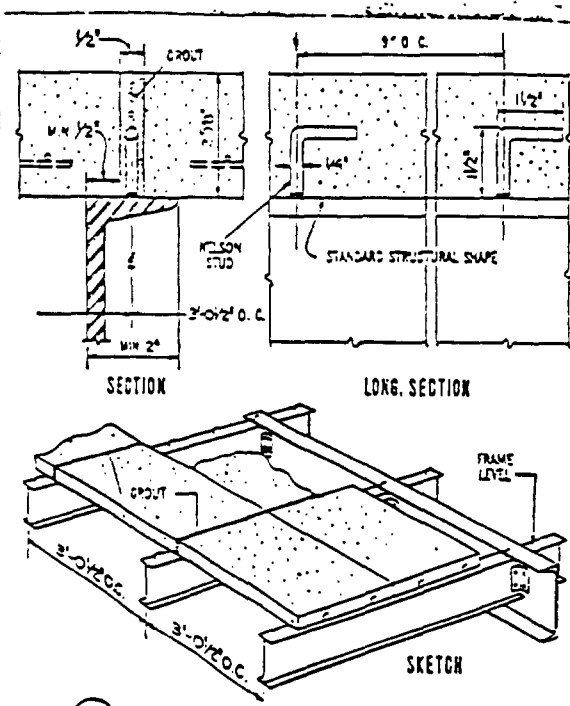
5. Saddles.

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.

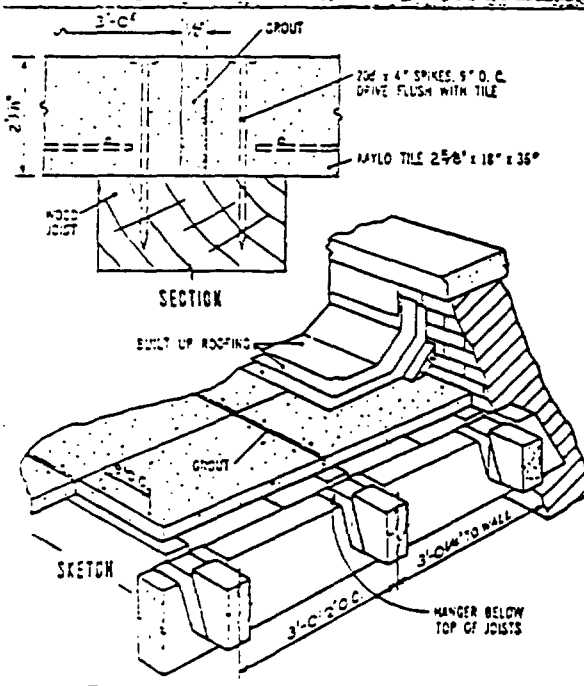
TILES KAYLO REDD TILE



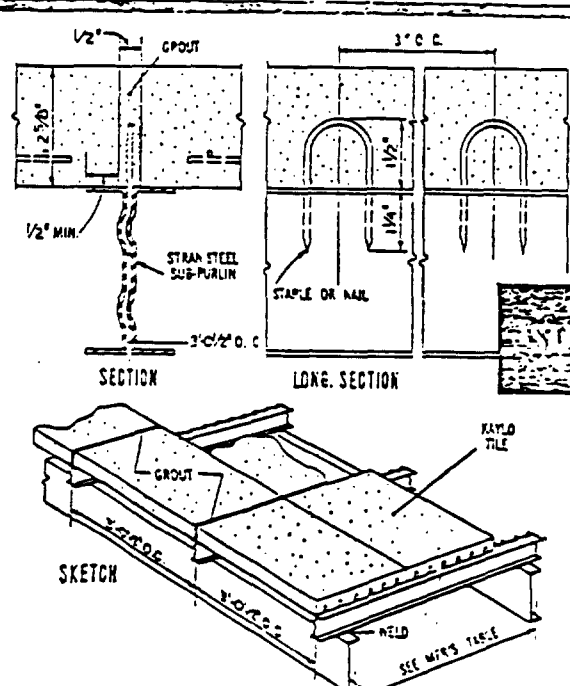
Detail A TRUSSED PURLINS



Detail B STANDARD STRUCT. SHAPES

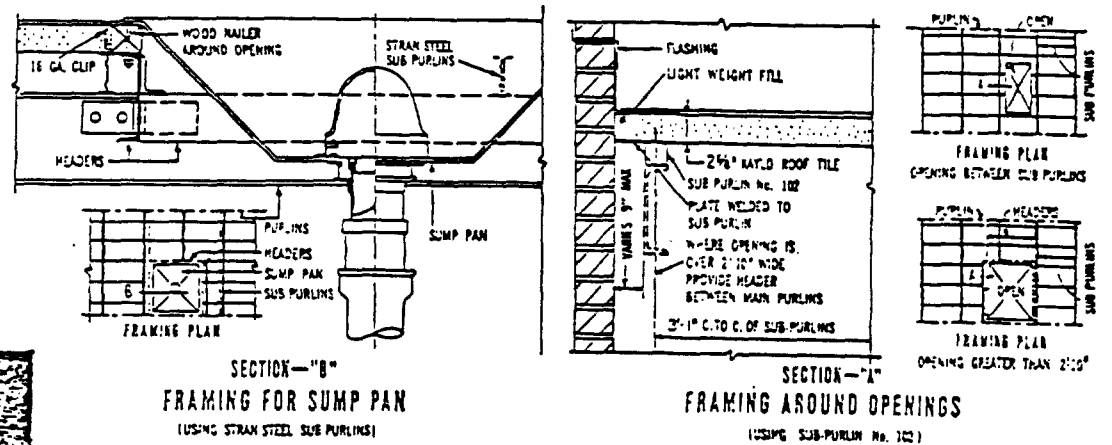
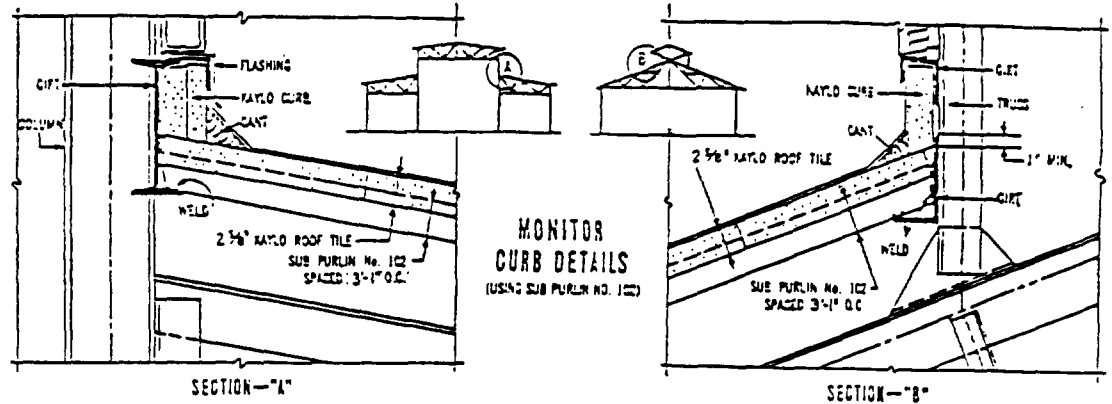


Detail C SLOW BURNING CONST.

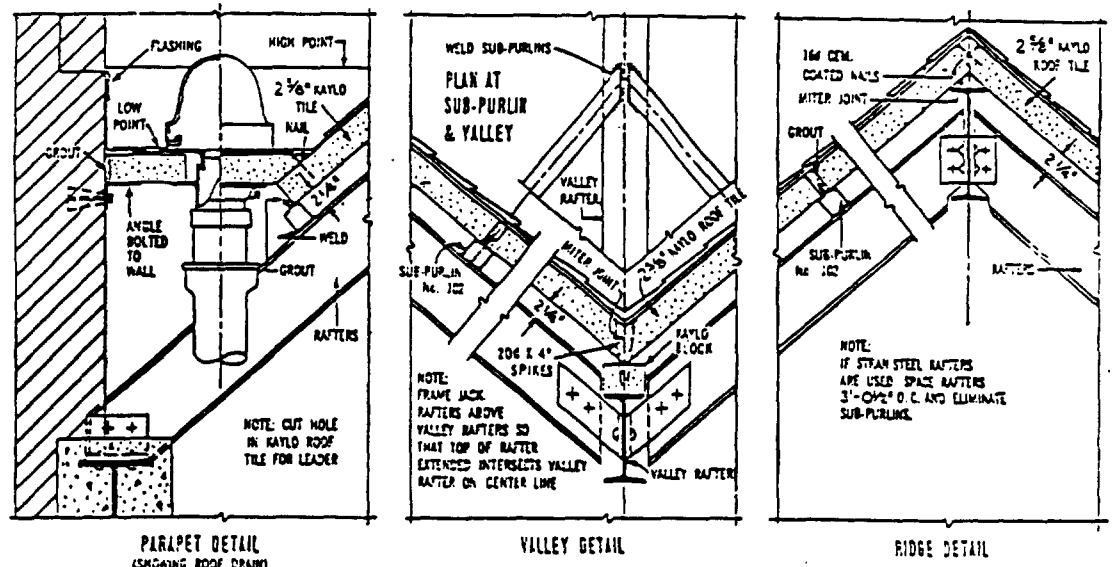


Detail D STRAN-STEEL SUB-PURLINS

Scale 3" = 1'-0"
Except as noted

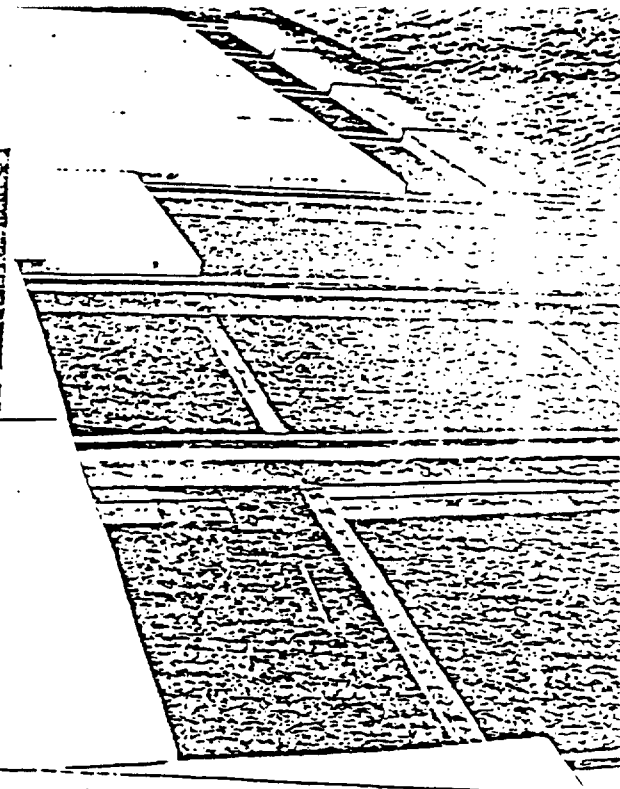
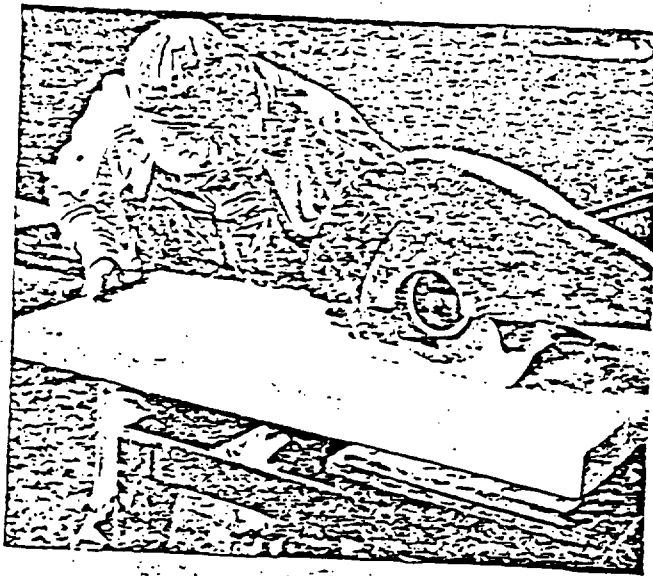


Scale 3/4" = 1'-0"
except as noted



DETAILS FOR STEEP PITCHED ROOFS—RAFTER FRAMING

... in 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.

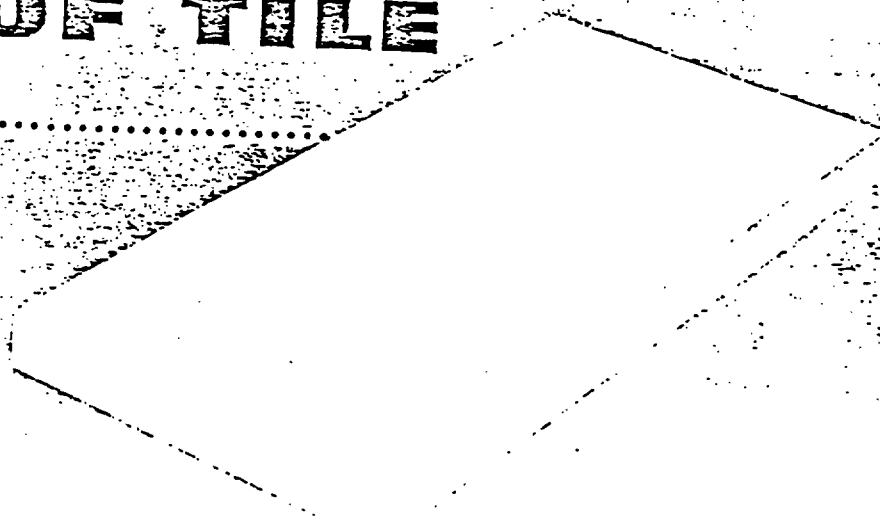


KAYLO[®]

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

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 + 1 1/2" 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 burning 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 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.).....	5.6
Approximate density (lb. per cu. ft.).....	20.6
Approximate weight per tile (lb.).....	23.7



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%.

KAYLO[®]

Insulating

ROOF TILE

For Lightweight, Non-Combustible Roof Decks



American Structural Products Company
Toledo, Ohio

SUBSIDIARY OF OWENS-ILLINOIS GLASS COMPANY

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Construction data for use with rail sub-purlins.....	7
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KAYLO[®]

Insulating ROOF TILE



Kaylo Roof Tiles have a wide distribution in standard and light weight. They are easy to handle—easy to carry. Many uses of time across Kaylo Roof Decks in construction for diverse building practices.

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 a half of standard insulating board, no additional insulation is needed for usual installations. A special treatment of applied insulation over the structural deck is true in all cases.

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 tests for more than one hour without failing in load-carrying capacity and without permitting a temperature rise on the inside that is 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 21" x 19 x 36 inches. It is white, or whitish in appearance and is made entirely of a non-combustible mineral base which is predominantly 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 insulative characteristics. Kaylo Insulating Roof Tile has cells so small that air is trapped in fractions of a micron, and so the surface number that more than 90% of the tile is composed of cells, which together have a total wall area of more than one million acres per cubic foot of tile!

Tile units have a smooth under-surface with a light reflector factor of approximately 50 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 overall transmittance, 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 20 pounds per tile (having an area of four and one-half square feet).

SPECIFICATIONS, DESIGN DATA AND

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, curbs 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 No. 102 x sub-purlins No. 102.

Before use, and the shop and field steel work shall be thoroughly cleaned, free from rust, mill scale and foreign matter and given the coat of approved metal protection applied thoroughly and evenly.

2. **Kaylo Roof Tile.** Roof tile shall be precast and reinforced Kaylo Roof Tile 2 1/2 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:

	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	7 1/2 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 2 1/2 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 No. 102 x sub-purlins No. 102 shall be spaced 3'-0" on centers.

Sub-purlins shall be welded to each support with one 1/2 inch weld, 1/2 inch long placed on alternate sides of support. Where joints of sub-purlins do not occur, then supports at ends shall be welded together. Where ends of sub-purlins rest on masonry, they shall be secured with one 1/2 inch anchor bolt shown in the drawings or with one bolt and one 1/2 inch anchor washer at each sub-purlin.

2. **Kaylo Roof Tile.** Kaylo Roof Tile shall be spaced over sub-purlins to provide a minimum end bearing of 1 1/2 inches that side up which is marked "top". The ends be putted together at sides. Cut tile to fit at gables, valleys, curbs, curbs, walls, around vents, pipe, etc., and grout in place.

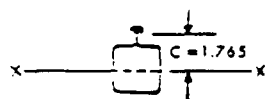
Where necessary to cut standard pieces for fitting, any oil or power saw which will cut the wire mesh is suitable.

3. **Grout.** Joints at ends of tile over sub-purlins and at gables 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 anchor against uplift pressure.

Grout shall be poured from an open spout until it reaches until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (after about 15 minutes) 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, prim surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SS-S-701). Map primer over 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	1 x 4 In. 4	1 x 4 In. 4	3 x 4 In. 4
3 1/4" x 2 13/32" 14 ga. Metal	Lb. L.F. 3.00 Lb. S.F. of Roof 1.00	3'-0" 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 b. per sq.

Central States..... 30 b. per sq.

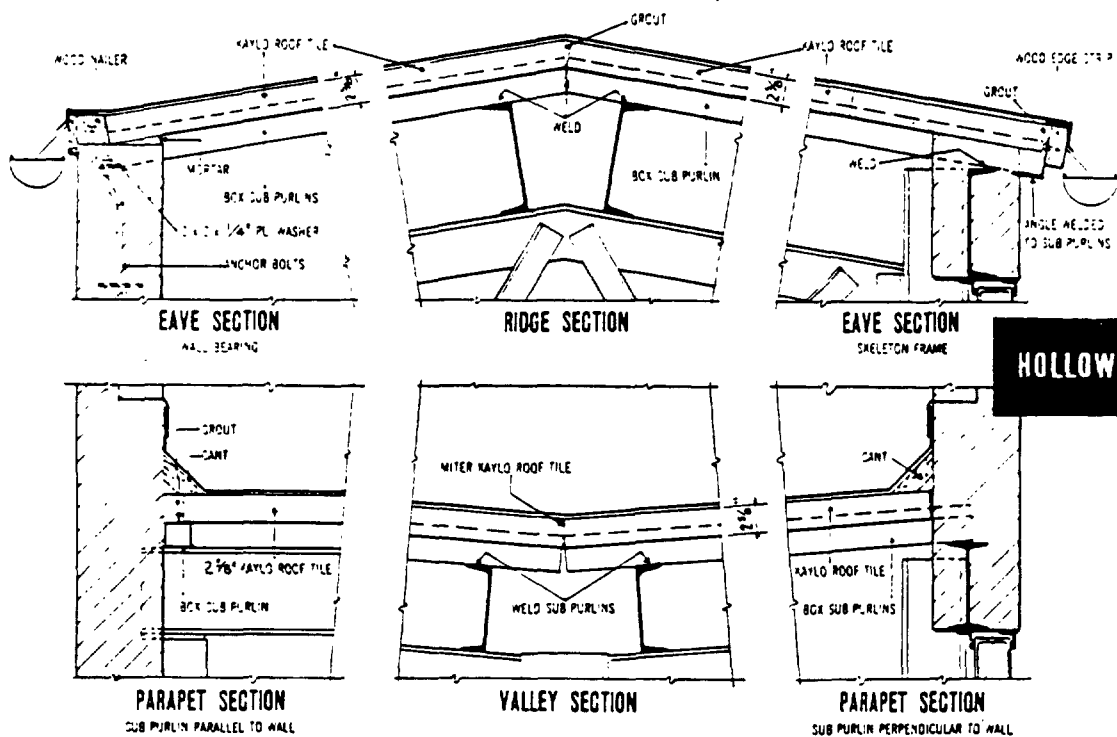
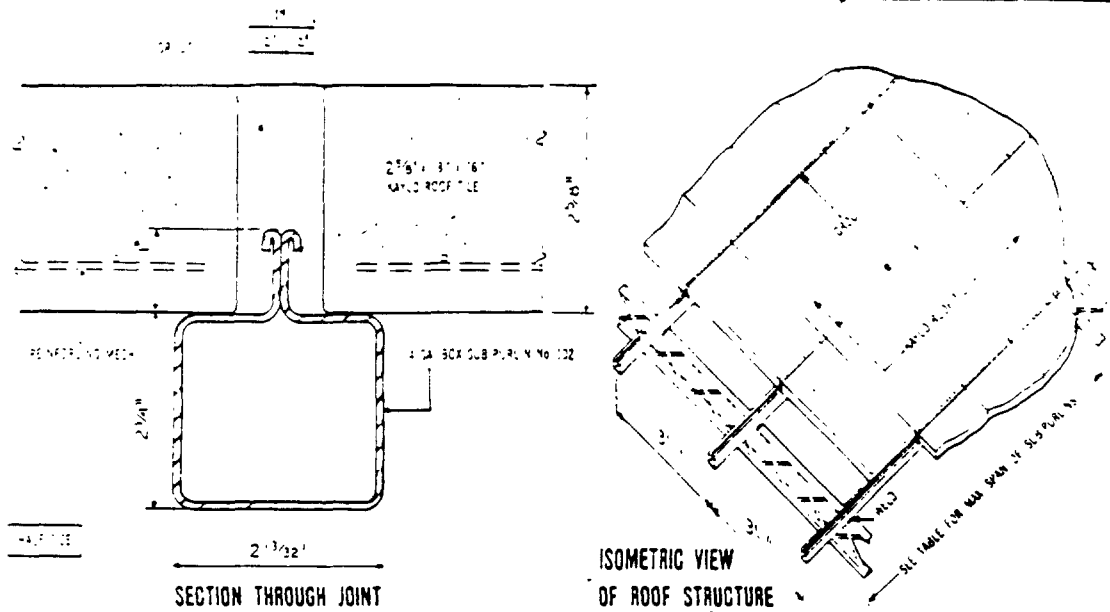
Rocky Mountains and N.E. States..... 37 b. per sq.

Northwest States..... 45 b. per sq.

$M = W/10$

* Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bending occurs reduce spans.

TAILS WATER NOOR TREE



HOLLOW BOX SUB-PURPLE

Scale $\frac{3}{4}'' = 1'-0''$
Except as noted:

SPECIFICATIONS, DESIGN DATA AND

Flat 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 oil, grease, 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, 2 1/4 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	7 1/2 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 2 1/4 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 spaced and spaced 7'-1 1/4" on centers.

Sub-purlins shall be welded to each support with one 1/4" weld. 3/4" inch long placed on alternate sides of purlins. Where joints of sub-purlins do not occur over supports, the ends shall be welded together. Where ends of sub-purlins occur on masonry, they shall be securely anchored to the masonry as shown on the drawings or with one bolt at each end, anchor.

2. Kaylo Roof Tile. Kaylo Roof Tile shall be spaced over sub-purlins to provide a minimum end bearing of 1 1/2" on that side up which is marked "top." Tile shall be butt-jointed together at sides. Cut tile to fit at ridges, valleys, parades, curbs, walls, around vents, pipes, etc. and about in place.

Where necessary to cut standard pieces for fitting any hole or power saw which will cut the wire mesh is suitable.

3. Grout. Joints at ends of tile over sub-purlins, and at end and hips, shall be filled with grout mixed as specified. When sub-purlin No. 101 is used the stem of the sub-purlin shall be completely surrounded with grout to provide a key 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, sweep out so joints flush with the tile surface. Sweep all excess and extra grout from the roof, leaving the roof deck free from all foreign matter.

4. Saddles. Where concrete (either lightweight or gravel aggregate) saddles or curbs are used over Kaylo Roof Deck, prism surface of tiles which receive saddles, or curbs, with asphalt primer (Federal specifications, SS-S-701). Mix primer over the 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	I-x-x		I-y-y		S-x-x	
			In. 4	In. 4	In. 4	In. 4	In. 4	In. 4
2-1/4" x 2-3/8"	Lb./L.F. 3.3	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 & Pac. 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
North-west 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 Pac. Slope

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.

North-west States..... 45 lb. per sq. ft.

M = W/10

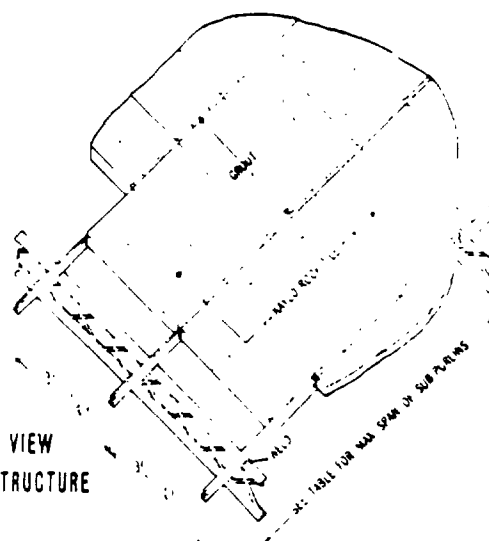
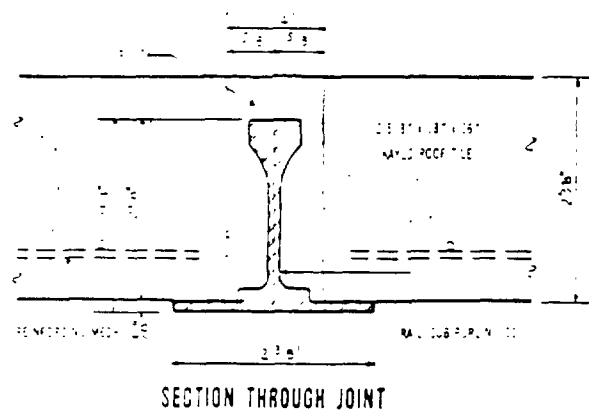
10

*Spans shown are for flat roofs. Where sub-purlins run parallel to the ridge of pitched roofs and unsymmetrical bending occurs, reduce spans.

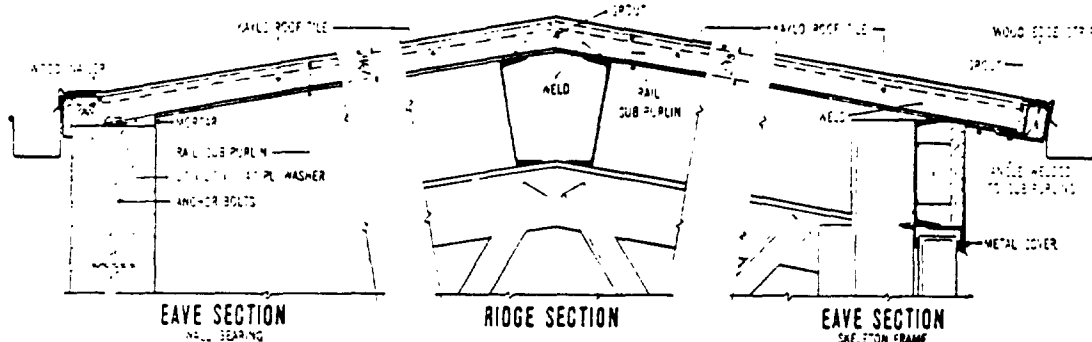
RAIL SUB-PURLIN KAYLO ROOF TILE

3c

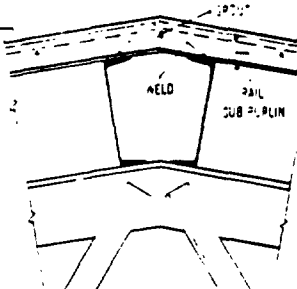
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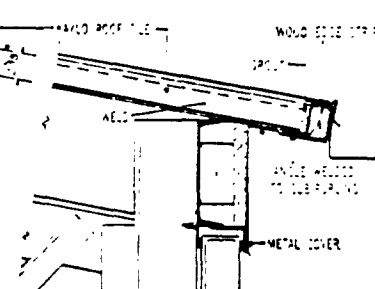
ISOMETRIC VIEW
OF ROOF STRUCTURE



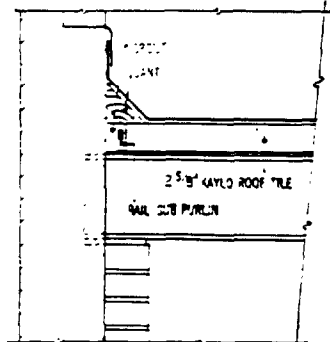
EAVE SECTION
WALL BEARING



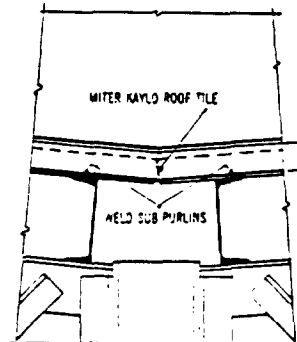
RIDGE SECTION



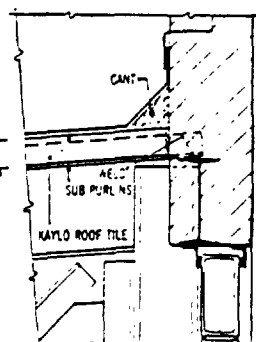
EAVE SECTION
SKELETON FRAME



PARAPET SECTION
SUB-PURLIN PARALLEL TO WALL



VALLEY SECTION



PARAPET SECTION
SUB-PURLIN PERPENDICULAR TO WALL

RAIL SUB-PURLIN

Scale 3/4" = 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, 21 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 1 1/2" x 1 1/2" 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 gal. (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	7 1/2 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 2 1/2 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 as shown. They shall be accurately spaced 36" on centers to lay Kaylo Roof Tile.

2. Kaylo Roof Tile.

Kaylo Roof Tile shall be spaced on sub-purlins as shown and provide an end bearing of at least 1 1/2" on each end. Tile shall be marked "top." Tile shall be butted end to end on all sides. Cut tile to fit at ridges, valleys, purlins, etc., and around vents, pipes, etc., and grout in place.

Where necessary to cut standard pieces, any and all type 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 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 purlins 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 1 1/4". The heads of the nails shall project above the Stran-Steel a minimum of 1 1/2".

dd. Staples (for Stran-Steel)

Staples shall be spaced 3" on centers and driven into Stran-Steel a minimum of 1 1/4". Staples shall project above Stran-Steel a minimum of 1 1/2".

4. Grout.

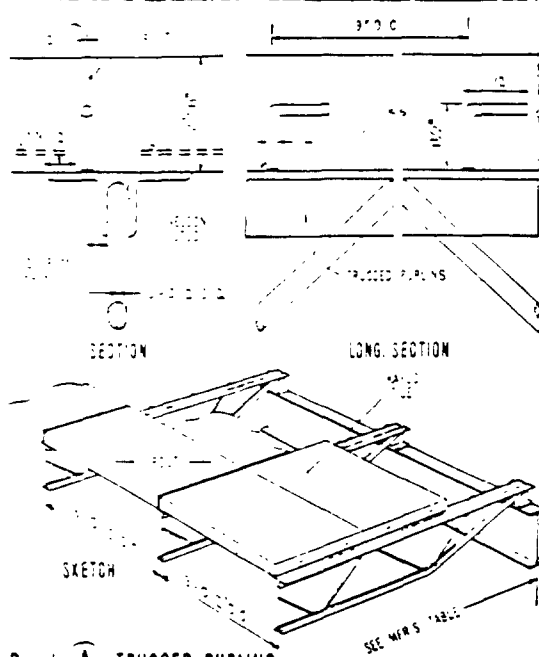
Joints at ends of tile over purlins or joists, and at ridges and hips, shall be filled with grout mixed as specified. The grout shall completely fill the joint over the purlins so that the (bent studs) (nails) (staples) are entirely encased in grout to provide anchorage against uplift pressure.

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.

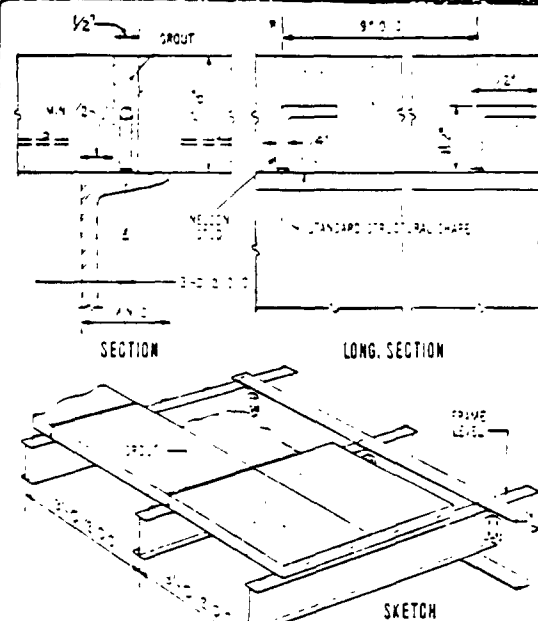
5. Saddles.

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.

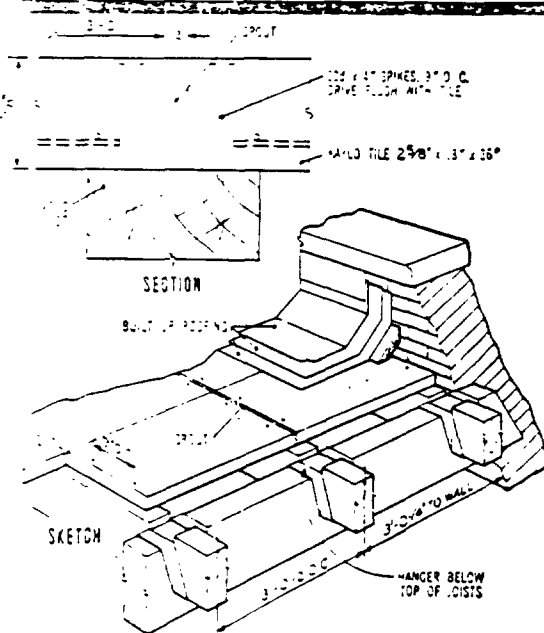
TAILS KAYLO ROOF TILE



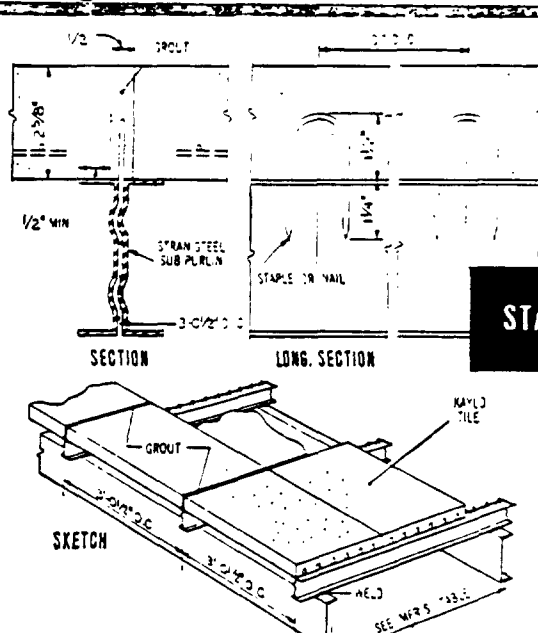
Detail A TRUSSED PURLINS



Detail B STANDARD STRUCT. SHAPES



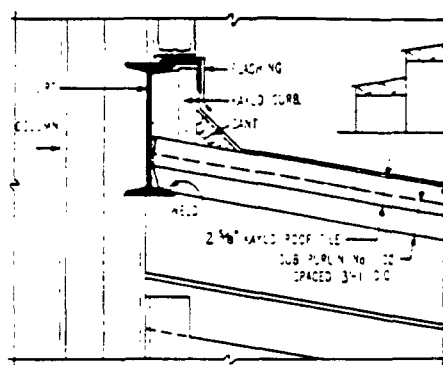
Detail C SLOW BURNING CONST.



Detail D STRAN-STEEL SUB-PURLINS

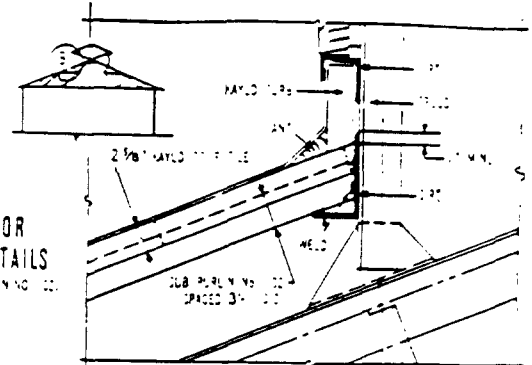
STANDARD PURLINS

Scale 3" = 1'-0"
Except as noted

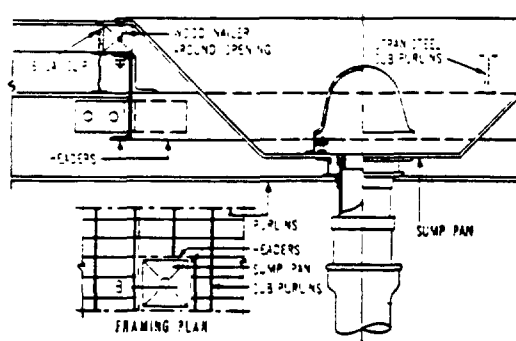


SECTION—A"

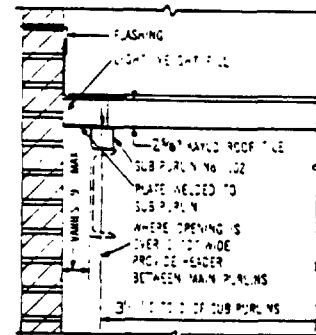
**MONITOR
CURB DETAILS**
USING SUB PURLIN No. 102



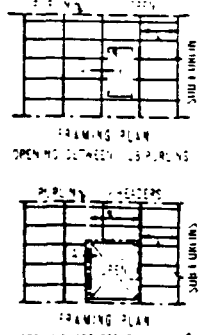
SECTION—B"



SECTION—C"
FRAMING FOR SUMP PAN
(USING STRAIN STEEL SUB PURLINS)

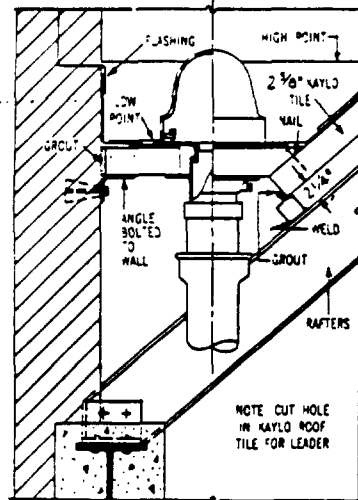


SECTION—D"
FRAMING AROUND OPENINGS
(USING SUB PURLIN No. 102)

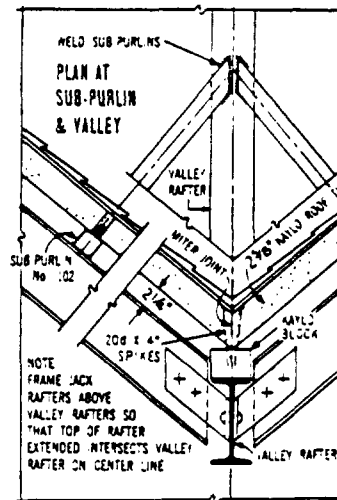


TYPICAL DETAILS

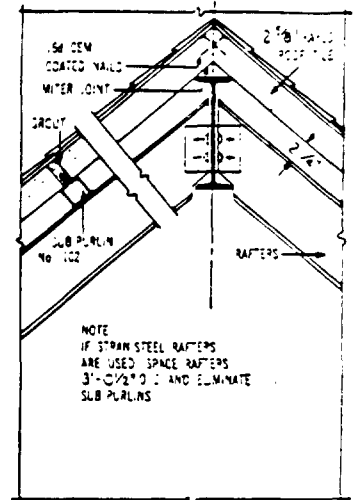
— Scale $\frac{3}{4}" = 1'-0"$
= Except as noted



PARAPET DETAIL
(SHOWING ROOF DRAIN)



VALLEY DETAIL



RIDGE DETAIL

DETAILS FOR STEEP PITCHED ROOFS—RAFTER FRAMING

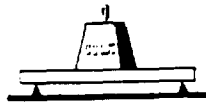
TECHNICAL DATA KAYLO ROOF TILE



INSULATING VALUE

Thermal conductivity (K) (Dtu sq. ft. in. F. min.)	0.02
Overall heat transfer coef. (U) (Dtu sq. ft. hr. F. thickness)	
Roof tile only	0.20
Roof tile - built-up roofing	0.10
Roof tile - 1 1/2" insulation - built-up roofing	0.11
Roof tile - 2" insulation - built-up roofing	0.10

Kaylo Density Kaylo Insulation



STRENGTH

FLEXURAL STRENGTH. This table shows the factor of safety and deflection of Kaylo Insulating Roof Tile for several uniform 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

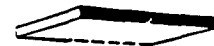
Kaylo Roof Tile is non-combustible. It will resist a typical building fire, as defined in the standard A.S.T.M. time-temperature curve, for more than one hour. Thus, a fire originating on the top side can burn off the applied covering and the fire resistance of the tile will enable the tile to carry its required load for more than one hour and at the same time

protect the interior from excessive temperature due to fire originating within the building or limit of resistance the limit of the supporting structure or the limit of the construction immediately below the roof deck.



WEIGHT

Approximate weight per square foot (lb.)	1.5
Approximate density (lb. per cu. ft.)	1.5
Approximate weight per tile (lb.)	1.5



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 35% of its normal strength.



NAIL-HOLDING POWER

RESISTANCE TO DIRECT NAIL WITHDRAWAL (SMOOTH NAILS)

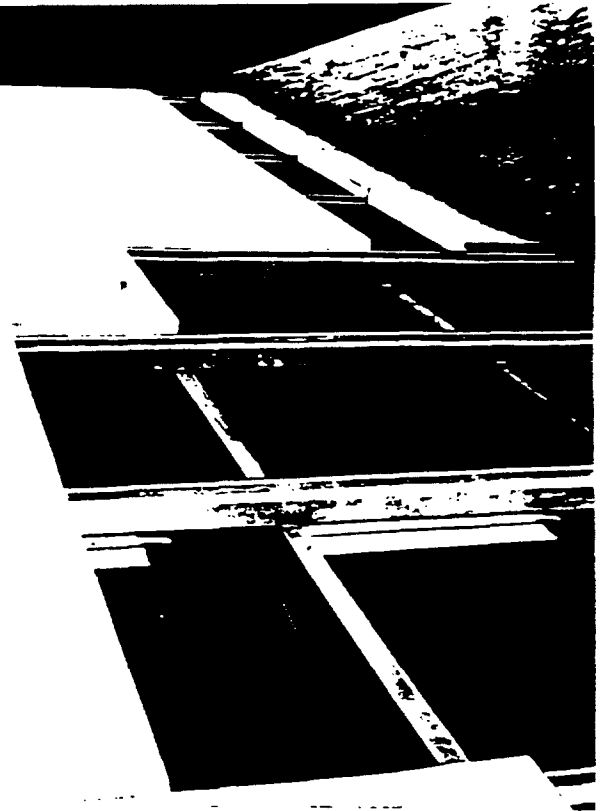
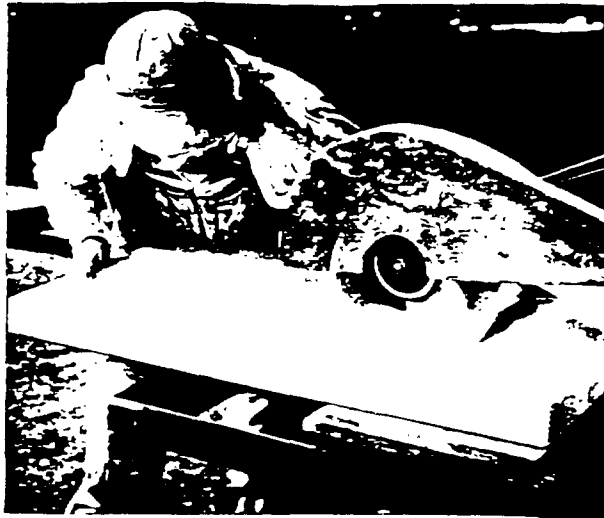
Size of Nail	6d	7d	8d	9d	10d	12d	16d	20d	30d	40d
Diameter in inches	.113	.113	.131	.131	.148	.148	.162	.192	.207	.225
Resistance of Kaylo Roof Tile (Total Pull in Lbs. per Inch Penetration)	20	20	23	23	26	26	28	32	36	40



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 gauged with a knife to fit over rivet heads or other irregular surfaces.



KAYLO®

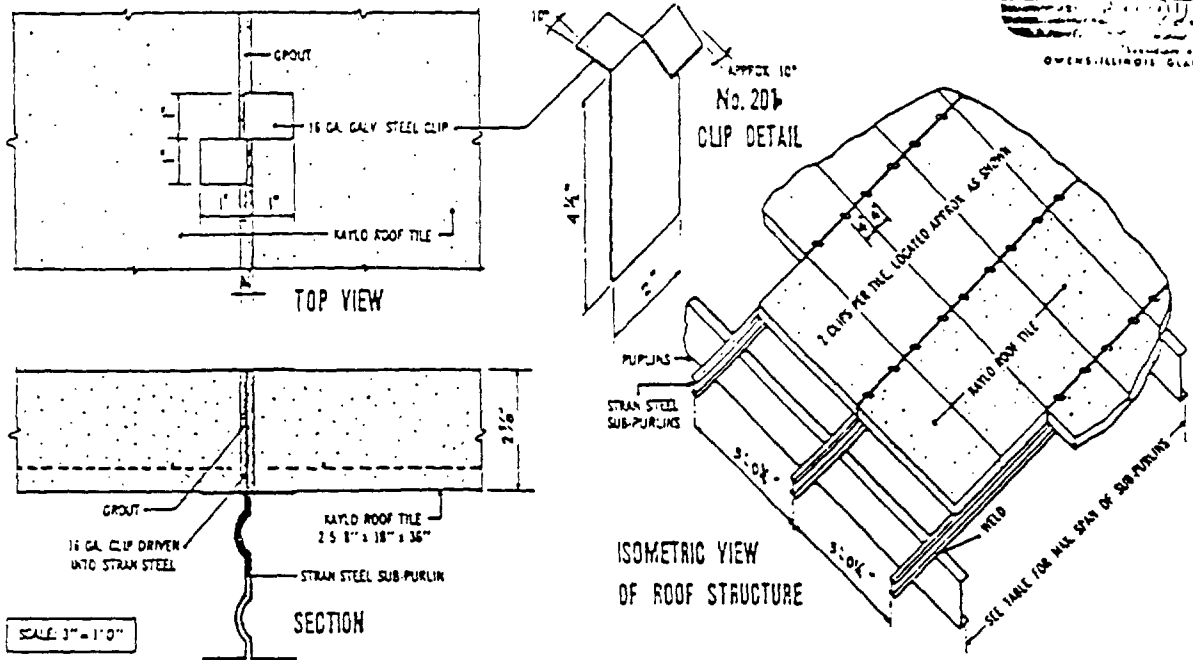
Insulating

ROOF TILE

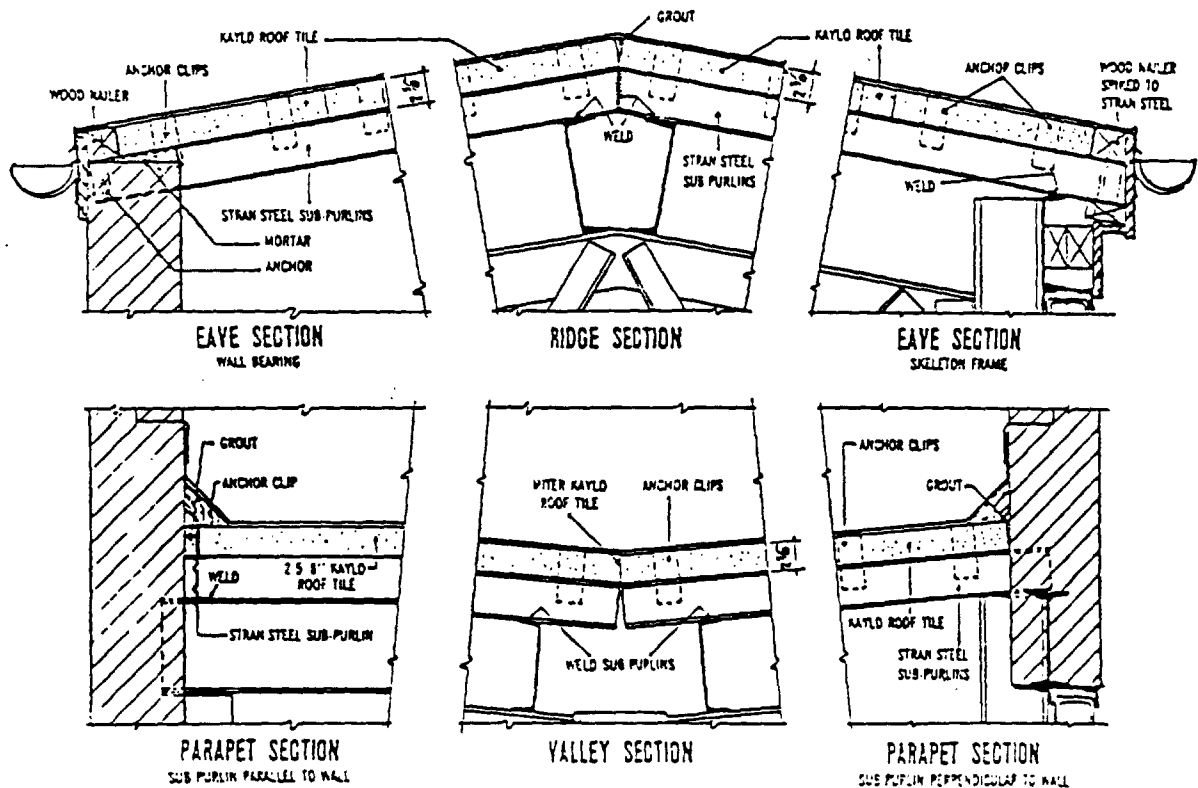
The light weight of Kaylo Roof Tile reduces dead load on buildings and saves steel.

American Structural Products Co., Toledo, Ohio
Subsidiary of Owens-Illinois Glass Company

KAYLO ROOF TILE DETAILS WITH STRAN-STEEL SUB-PURLINS



DETAILS OF ANCHORS TO STRAN-STEEL SUB-PURLINS



TYPICAL CONSTRUCTION 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 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, 2 3/4 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	Batch
	Ratio	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 2 3/4 inches thick by 18 inches wide by 36 inches long shall be used, or 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'-0 1/4" on centers.

Sub-purlins shall be welded to each support with one fillet weld, 3/8 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 1/4-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.

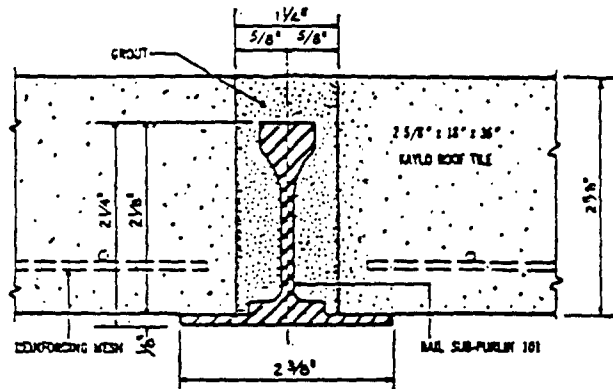
Grout shall be poured from a spouted can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign 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

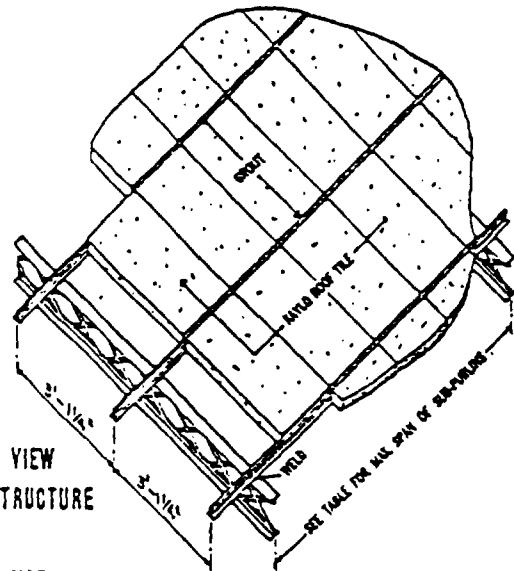
KAYLO ROOF TILE		STRAN-STEEL SUB-PURLIN					
Size.....	2 3/4" x 18" x 36"	Size	Weight	Spacing	1x4 In. 4	1 1/2x In. 4	2x In. 3
Weight (21 lb. tile), Approx.....	4 1/2 lb. per sq. ft.	2" Flange, 3 1/4" deep, 16 ga.	Lb./L.F. 2.244	Lb./S.F. .75	3'-0 1/4" On Center	1.183	.090
Density, Approx.....	20 lb. per cu. ft.						.641
Reinforcing.....	3"x3"x10 ga. galv. welded wire mesh	ALLOWABLE SPANS FOR VARIOUS LOAD CONDITIONS					
Specific Heat.....	0.22 Btu per lb. per °F.						
Av. Modulus of Rupture.....	180 lb. per sq. inch						
Av. Crushing Strength.....	300 lb. per sq. inch						
Av. Mod. of Elasticity.....	180,000 lb. per sq. inch						
Light Reflection.....	Approx. 85%						
OVER-ALL COEFFICIENT OF HEAT TRANSMISSION							
"U" BTU/SQ.FT./HOUR/°F							
Base Tile.....	0.20						
Tile - Built-up Roofing.....	0.19						
Tile - 1" Insulation + Built-up Roofing.....	0.13						
Tile - 1 1/2" Insulation - Built-up Roofing.....	0.11						
Tile - 2" Insulation + Built-up Roofing.....	0.10						
*11 lb. density Kaylo Insulation							
		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 (see load) 20 lb. per sq. ft.					
		Central States..... 30 lb. per sq. ft.					
		Rocky Mountains and					
		M. E. States..... 37 lb. per sq. ft.					
		Northwest States..... 45 lb. per sq. ft.					
		M = $\frac{W1}{10}$ (W = 20,000 lb. per sq. inch)					

KAYLO ROOF TILE DETAILS WITH RAIL SUB-PURLIN No. 101

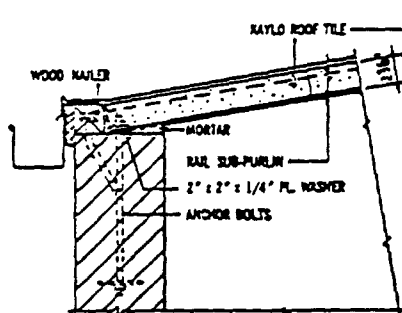


SECTION THROUGH JOINT

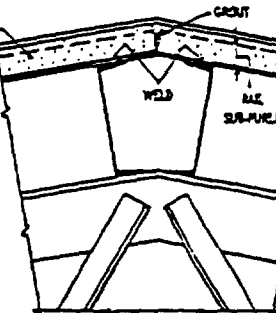
HALF SIZE



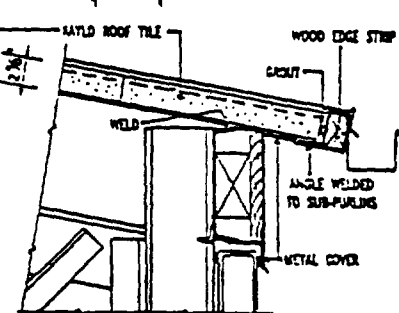
ISOMETRIC VIEW
OF ROOF STRUCTURE



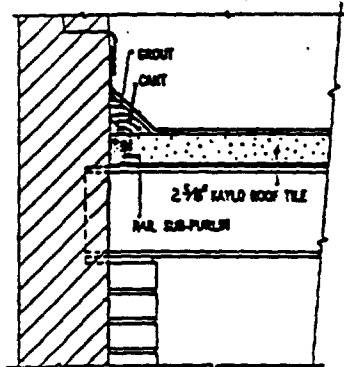
EAVE SECTION
WALL BEARING



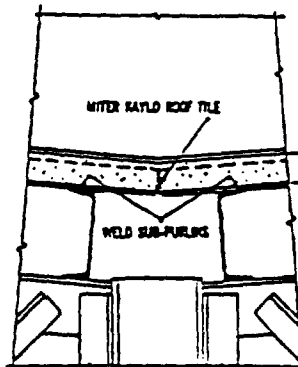
RIDGE SECTION



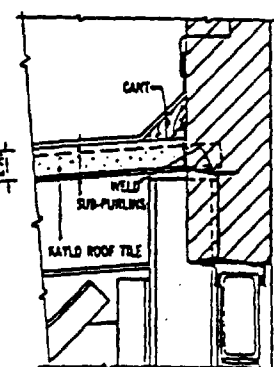
EAVE SECTION
SKELETON FRAME



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, 2 1/4 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	7 1/2 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 2 1/4 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'-1 1/4" on centers.

Sub-purlins shall be welded to each support with one fillet weld, 3/4 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 1/4 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.

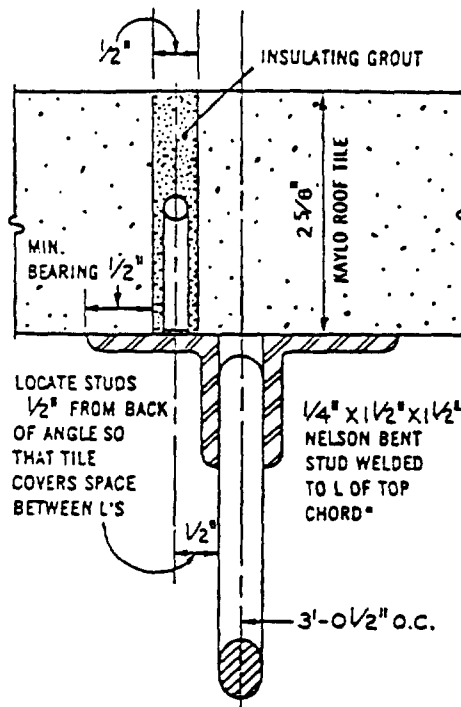
Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

4. Saddles. Where concrete (either lightweight or gravel aggregate) saddles or cans are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cans, with asphalt primer (Federal specifications, SS-5-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per one hundred square feet of roof.

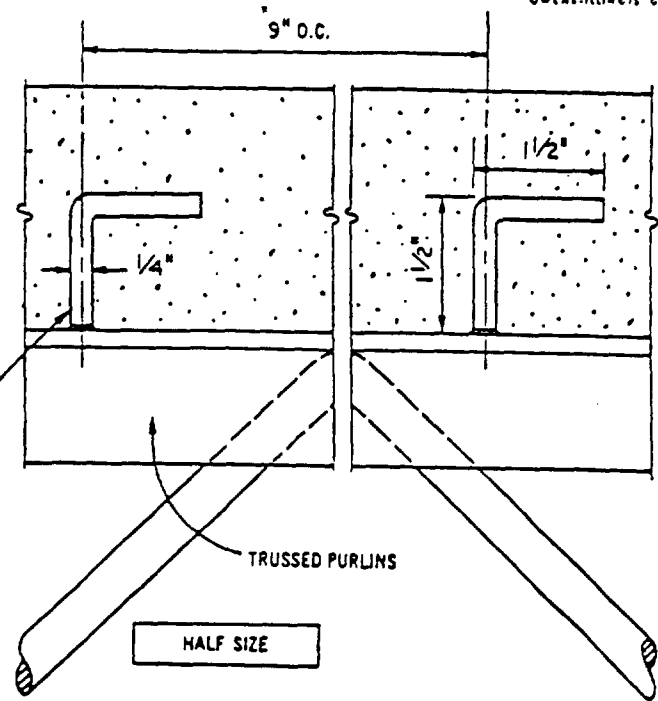
DESIGN DATA FOR KAYLO ROOF DECKS

KAYLO ROOF TILE		RAIL SUB-PURLIN NO. 101					
Size	Weight (23 lb. tile) approx.	Size	Weight	Spacing	12" x 12"	12" x 12"	12" x 12"
2 1/4" x 18" x 36"	5 lb. per sq. ft.	2 1/4" x 18"	3.3	3'-1 1/4" On Centers	.684	.182	.222
Weight, 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		ALLOWABLE SPANS FOR VARIOUS LOAD CONDITIONS					
"U" BTU/SQ.FT./HOUR/°F		Total Load (Per Sq. Ft.)	Span*	Deflection	1-20,000	1-18,000	1-18,000
Base tile	0.20						
Tile - built-up roofing	0.19						
Tile - 1 1/2" insulation* - built-up roofing	0.11						
Tile - 2" insulation - built-up roofing	0.10						
*1 1/2" density Kaylo insulation.							
		*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:					
		Assumed snow load on horizontal surface per square foot of roof:					
		Southern States and Pacific Slope (five load)					
		Central States					
		Rocky Mountains and N. E. States					
		Northwest States					
		M = W / 10					

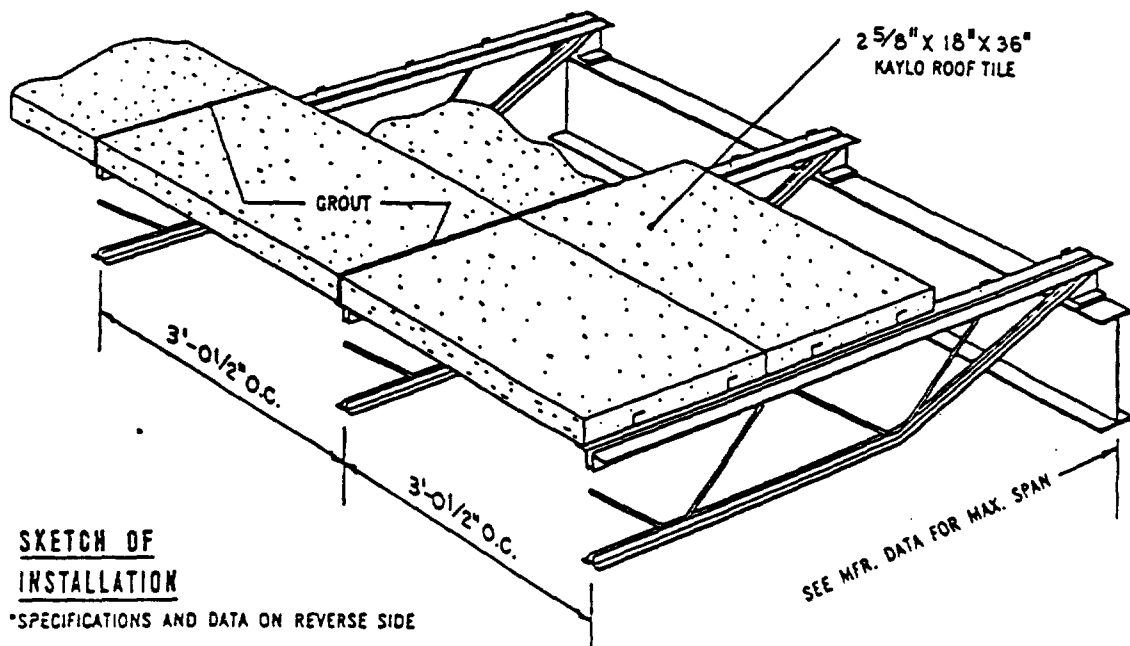
KAYLO ROOF TILE—DETAILS WITH TRUSSED PURLINS



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 $1\frac{1}{4}$ " x $1\frac{1}{4}$ " 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, $2\frac{3}{4}$ 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	$7\frac{1}{4}$ 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 $2\frac{3}{4}$ 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 $3'-0\frac{1}{4}"$ 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 $2\frac{3}{4}$ 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 $\frac{1}{4}$ 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.

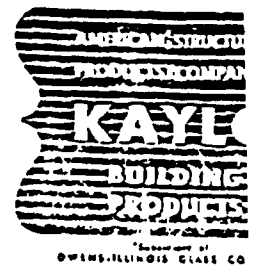
5. Saddles

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.

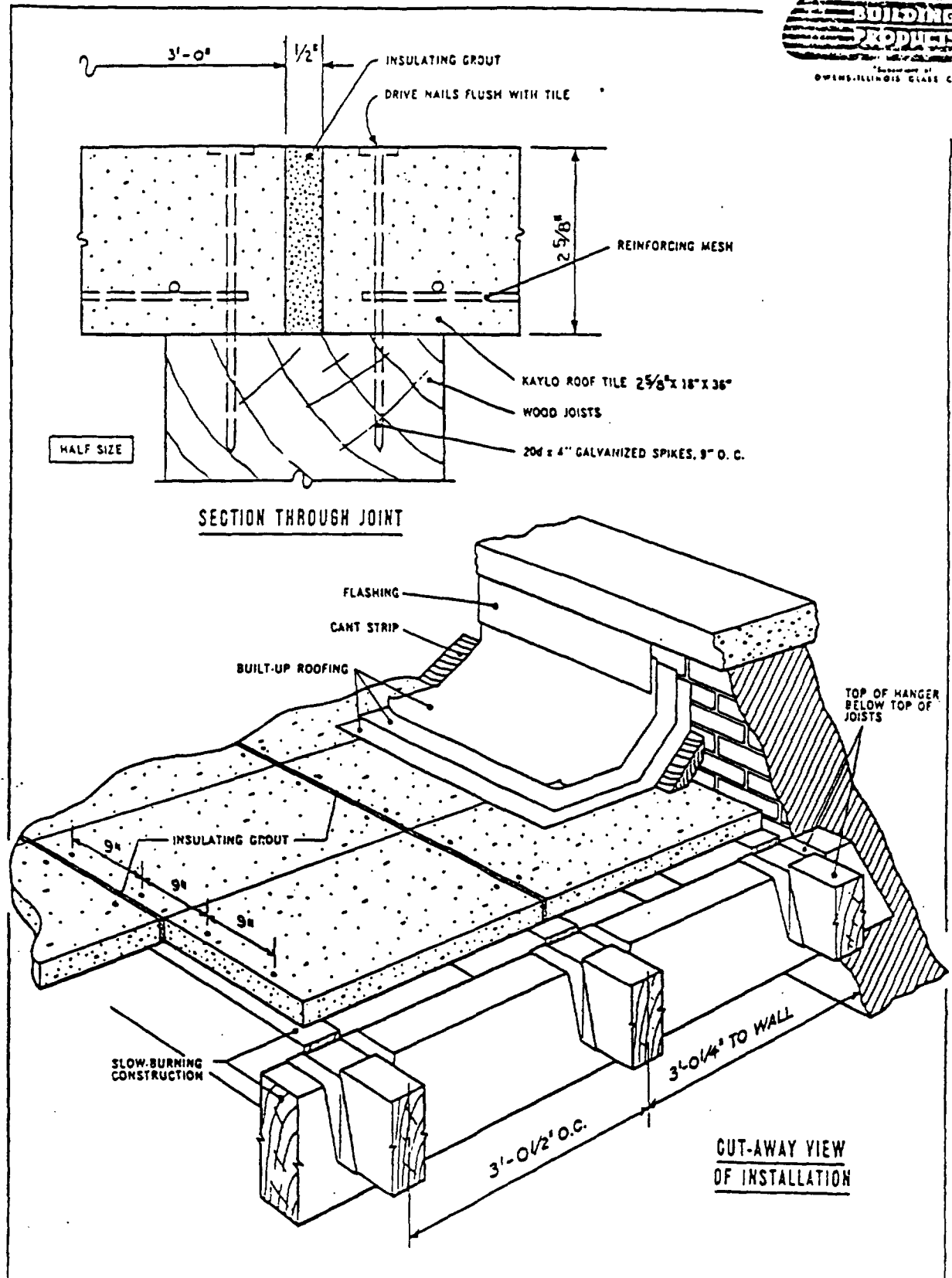
DESIGN DATA FOR KAYLO ROOF TILE

PHYSICAL CHARACTERISTICS	OVER-ALL COEF. OF HEAT TRANS.
Size..... $2\frac{3}{4}"$ x $18"$ x $36"$	Bare tile..... 0.20
Weight (23 lb. tile)	Tile + built-up roofing..... 0.19
Approx. 5 lb. per sq. ft.	Tile + $1\frac{1}{2}"$ insulation* + built-up roofing. 0.11
Density, approx. $20\frac{1}{4}$ lb. per cu. ft.	Tile + 2" insulation + built-up roofing.. 0.10
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%	
	*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



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 pails, 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, 2 3/4 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	7 1/4 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 2 3/4 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'-0 1/4" 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 1/4 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.

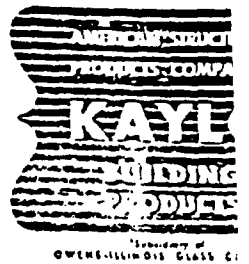
Grout shall be poured from an open-spout can into joints until the grout protrudes slightly above the surface of the tile. When grout has reached its initial set (few minutes) scrape joints flush with the tile surface. Sweep all loose and excess grout from the roof, leaving the roof deck free from all foreign matter.

4. Saddles

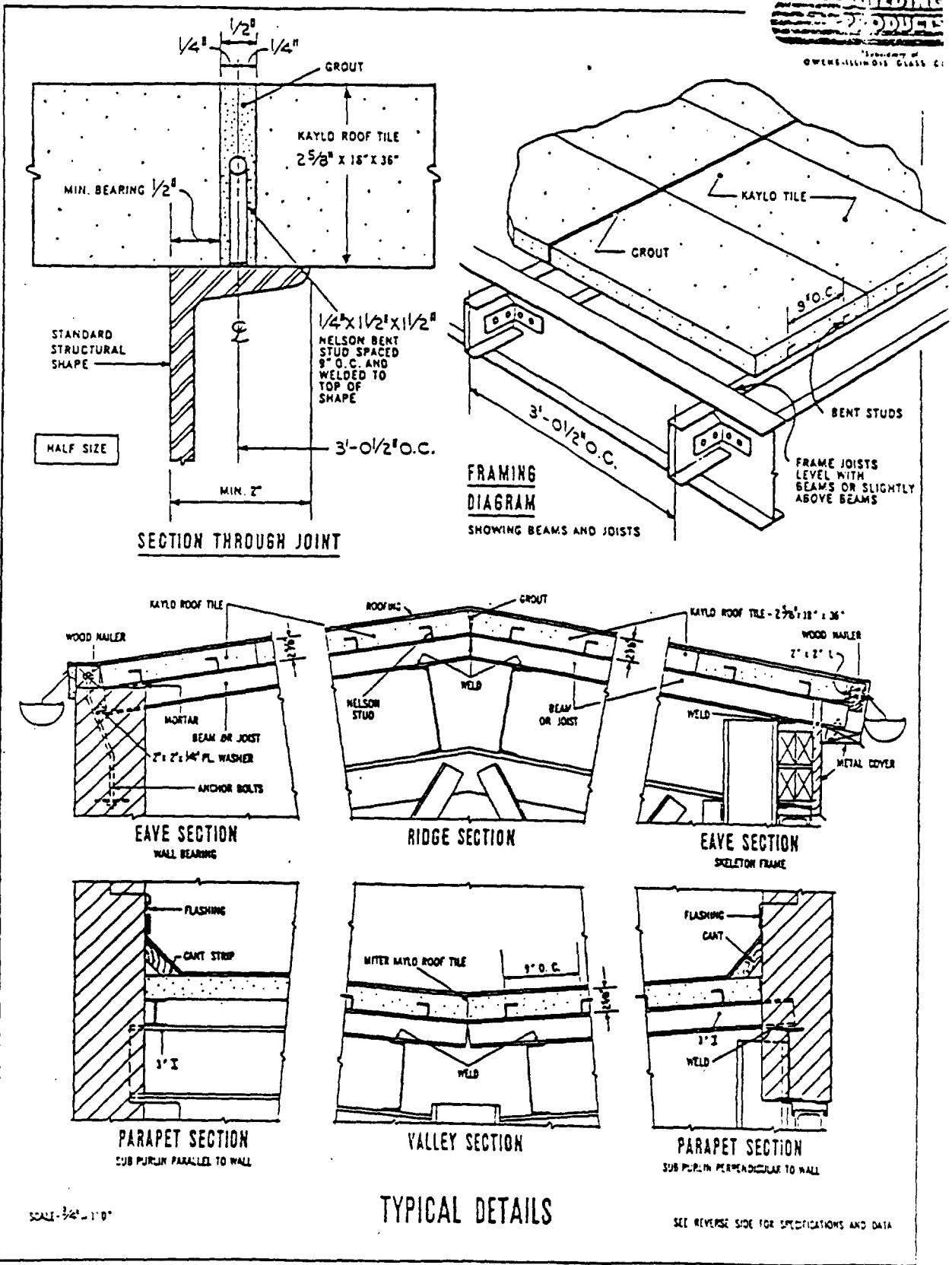
Where concrete (either lightweight or gravel aggregate) saddles or cants are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cants, with asphalt primer (Federal specifications, SSS-701). Mop primer over top surface of tile using not less than 7.5 pounds (one gallon) per hundred square feet of roof.

DESIGN DATA FOR KAYLO ROOF TILE

PHYSICAL CHARACTERISTICS	OVER-ALL COEF. OF HEAT TRANS.
Size.....2 3/4" x 18" x 36"	
Weight (23 lb. tile)	
Approx.....5 lb. per sq. ft.	
Density, approx.....20 1/2 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%	
	Bare tile.....0.20
	Tile + built-up roofing.....0.19
	Tile + 1 1/4" 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



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 $1\frac{1}{4}$ " x $1\frac{1}{4}$ " N.T. Bent O.L.F. 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, $2\frac{3}{4}$ 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:

	Ratio	Proportions 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 $2\frac{3}{4}$ 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 $3'0\frac{1}{2}"$ 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 $\frac{1}{4}$ 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, 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 cantis are used over Kaylo Roof Deck, prime surface of tiles which receive saddles, or cantis, 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	OVER-ALL COEF. OF HEAT TRANS.
Size..... $2\frac{3}{4}"$ x $18"$ x $36"$	Bare tile..... 0.20
Weight (23 lb. tile)	
Approx..... 5 lb. per sq. ft.	Tile + built-up roofing..... 0.19
Density, approx..... $20\frac{1}{4}$ lb. per cu. ft.	Tile + $1\frac{1}{2}"$ insulation + built-up roofing 0.11
Reinforcing $3" \times 3" \times 10$ ga. galv. welded wire mesh	Tile + 2" insulation + built-up roofing .. 0.10
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%	
	*11 lb. density Kaylo Insulation.
	"U" BTU/SQ. FT./HOUR/°F.

FOR TRUSS SPANS, SEE TRUSS MFR'S SPECIFICATIONS



KAYLO

KAYLO*

*Registered trade name for

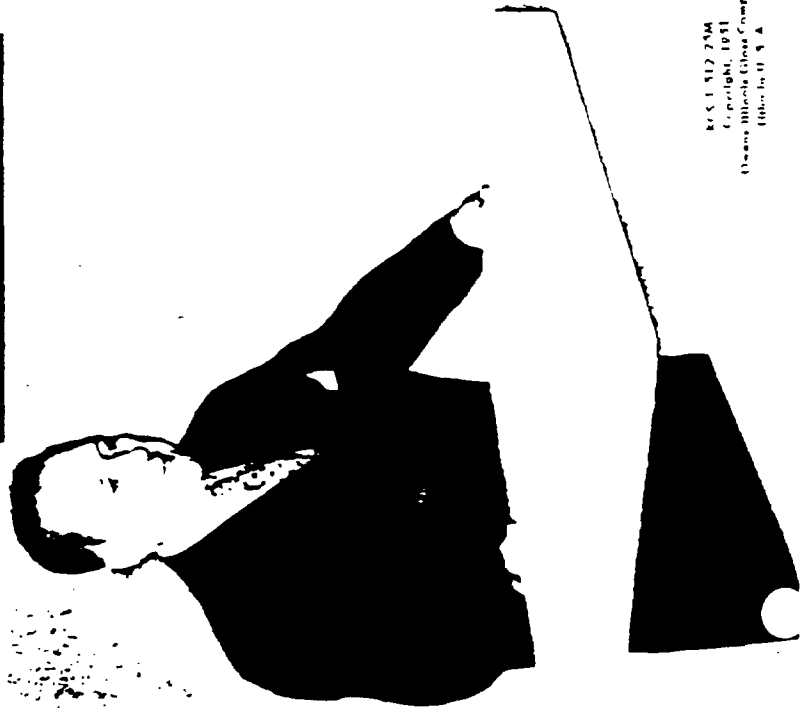
A BETTER BUILDING AND INSULATING MATERIAL

Pioneered by

OWENS ILLINOIS

GLASS COMPANY

Tolledo 1, Ohio



First in Calcium Silicate

A new material is taking its place alongside the "old stand by" 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 1913 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

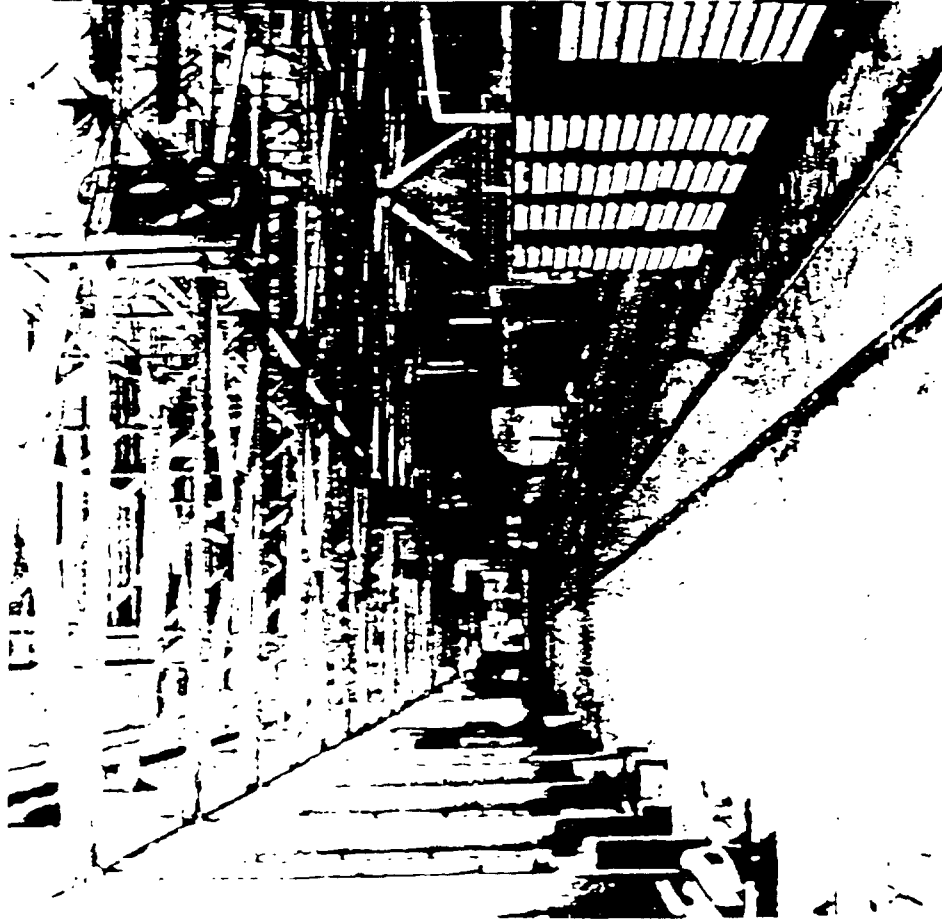
Although Kaylo calcium silicate contains two of the raw materials which are used in making glass, it is not a glass product. Glass is made by fusion (melting together) of the raw materials. Calcium silicate is the result of a direct chemical reaction between lime and sand.

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.

WHY KAYLO MATERIAL IS . . .



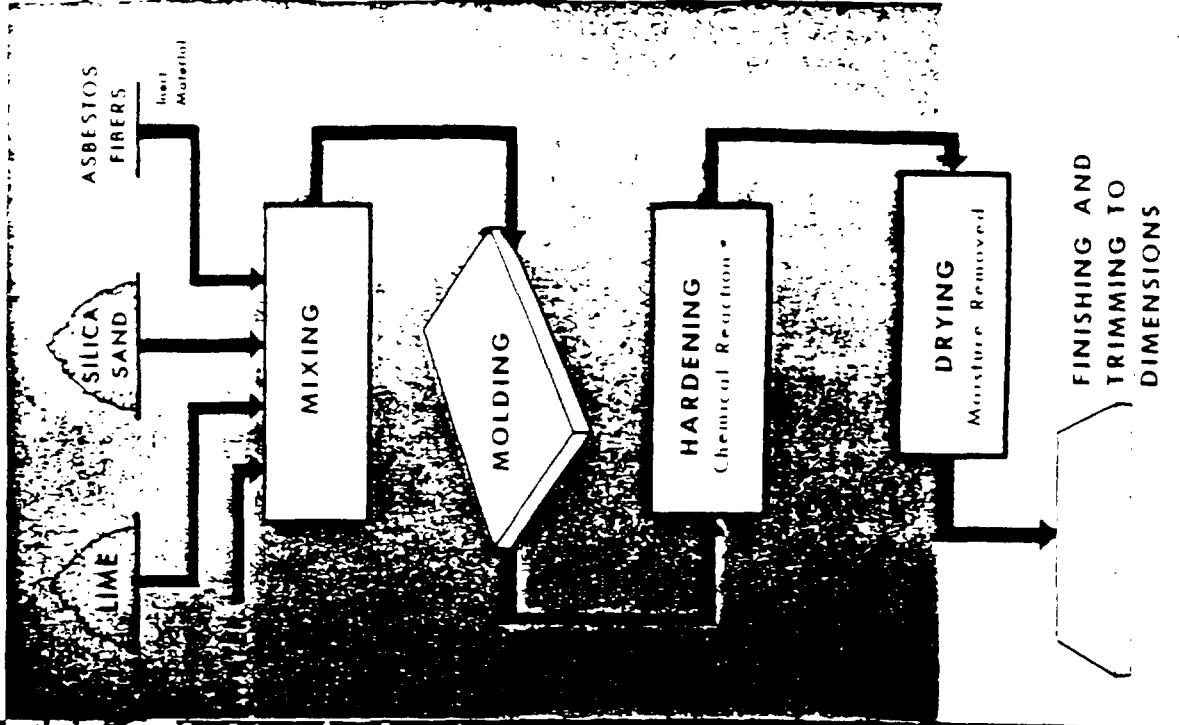
Factory of Kaylo Division
Columbus, Ohio - Kaylo Company

PURE CALCIUM SILICATE
IS THE RESULT OF A
CHEMICAL PROCESS



FLOW DIAGRAM

Kaylo Hydrous Calcium Silicate From Raw Material
To Finished Product



Characteristics

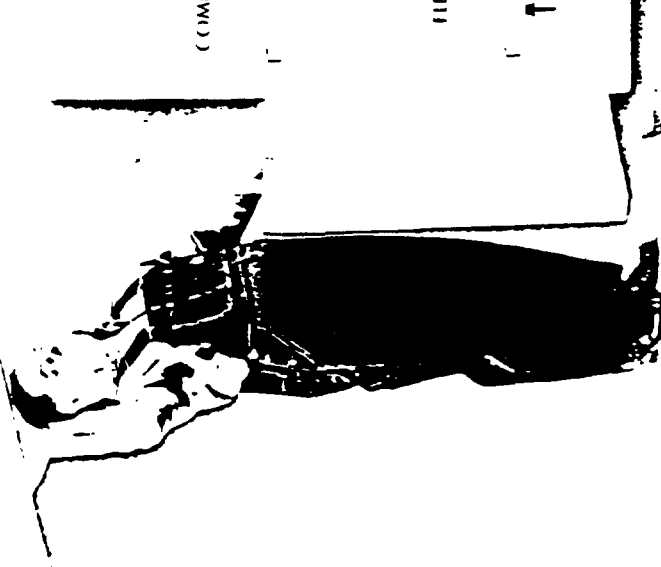
Light Weight

Billions of microscopic air spaces which are formed during manufacture give Kavlo material its extremely light weight and low thermal conductivity.

Strong

COMPRESSION STRENGTH

FLEXURAL STRENGTH



Insoluble In Water

Kavlo material has been tested continuously for 24 hours and longer. After drying, it regains strength and in almost all cases, even when saturated, Kavlo material retains about 85% of its strength.

Incombustible, Resistant to Heat Flow and to Temperature Change

Kavlo material has been tested at the Underwriters' Laboratories in Chicago and given the following rating, based on comparison with untreated Red Oak as 100:

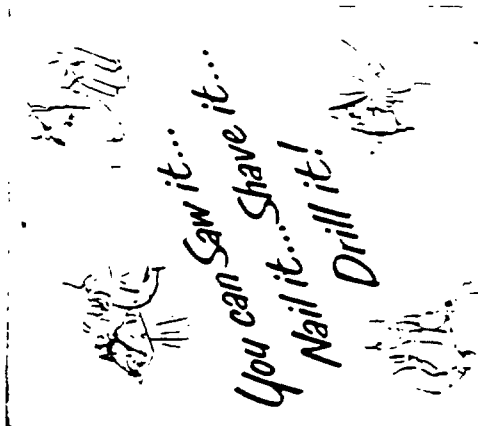
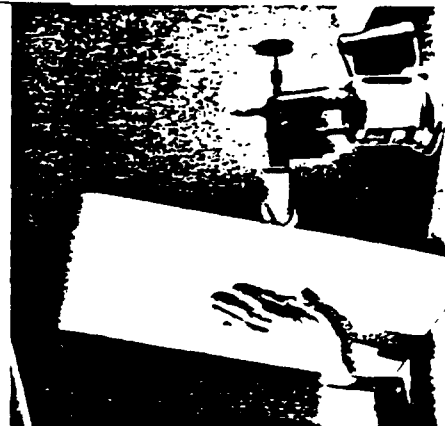
Flame spread	0.0
Fuel contributed	negligible
Smoke produced	0.0

In another test, a section of Kavlo 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 conductivity. In other words, fingers take the heat away faster from the surface than heat can come to the surface of the Kavlo column etc.

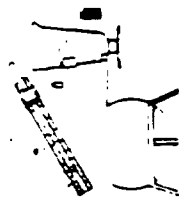
Other Properties

Kavlo claims the following exceptional properties: It is fireproof and flameproof. It is resistant and corrosion proof. It does not support mold. Its non-white color provides high light reflectivity. It is compatible with standard adhesives and may be bonded to nearly any other type of structural material.



You can Saw it...
You can Shave it...
Nail it... Drill it!

Research and Development



In 1938, Owens Illinois first turned its attention to this new field. By 1940 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 1930'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 structure 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 product Owens Illinois continues an extensive development program. Research projects include studies of basic chemical properties, the physical properties of the material, its behavior in product form, and all other methods and manufacturing techniques.

Experiments in the building and insulating products are being kept fully 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.

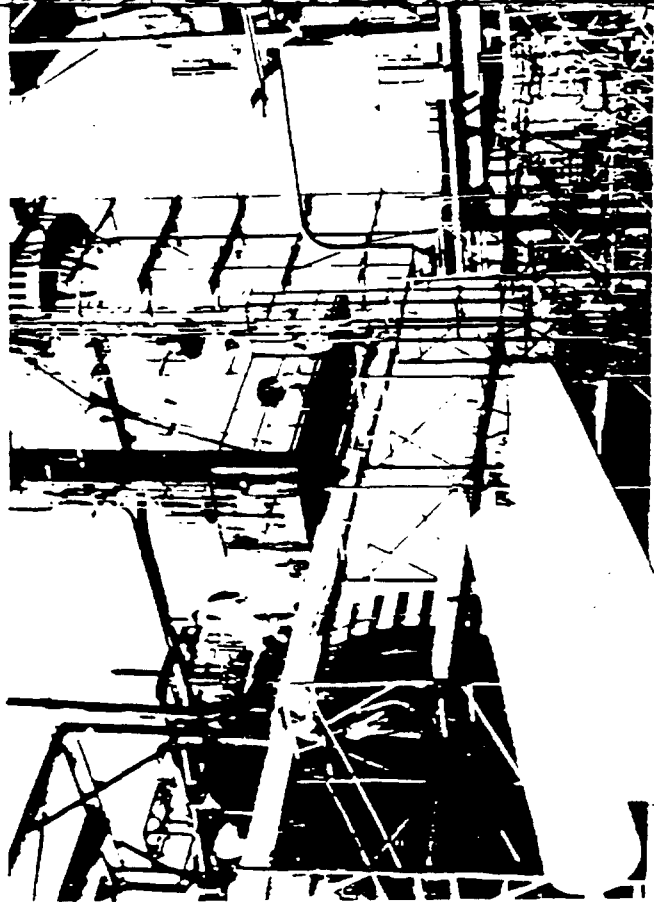
A few years later, construction began on a quarter-mile long manufacturing plant at Sayreville, New Jersey, and actual commercial manufacturing of Kaylo products started there in March, 1948. Since that time the capacity of the Berlin plant has also been expanded several times.

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.

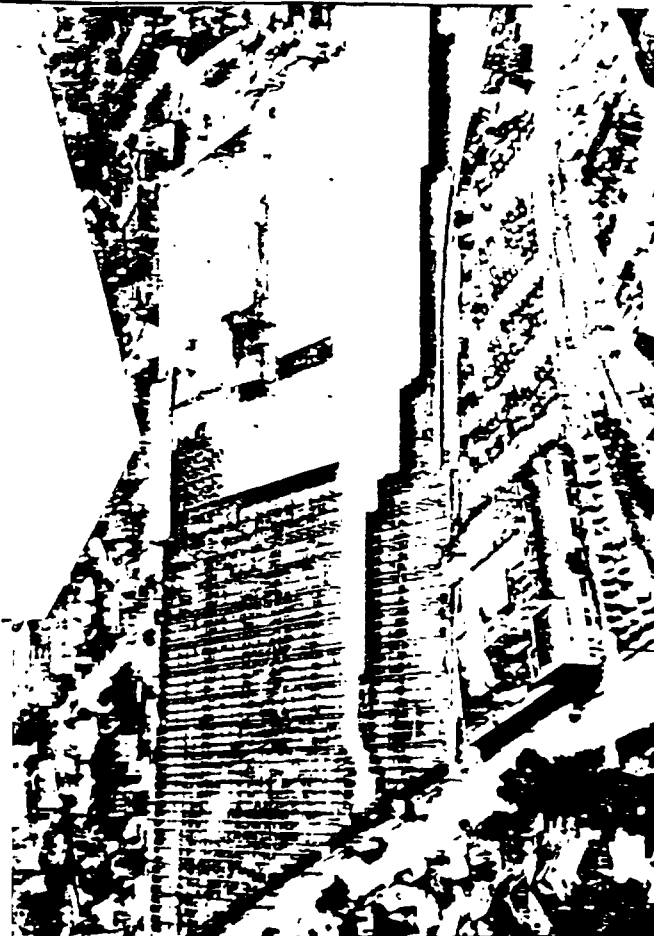


Thermal Density

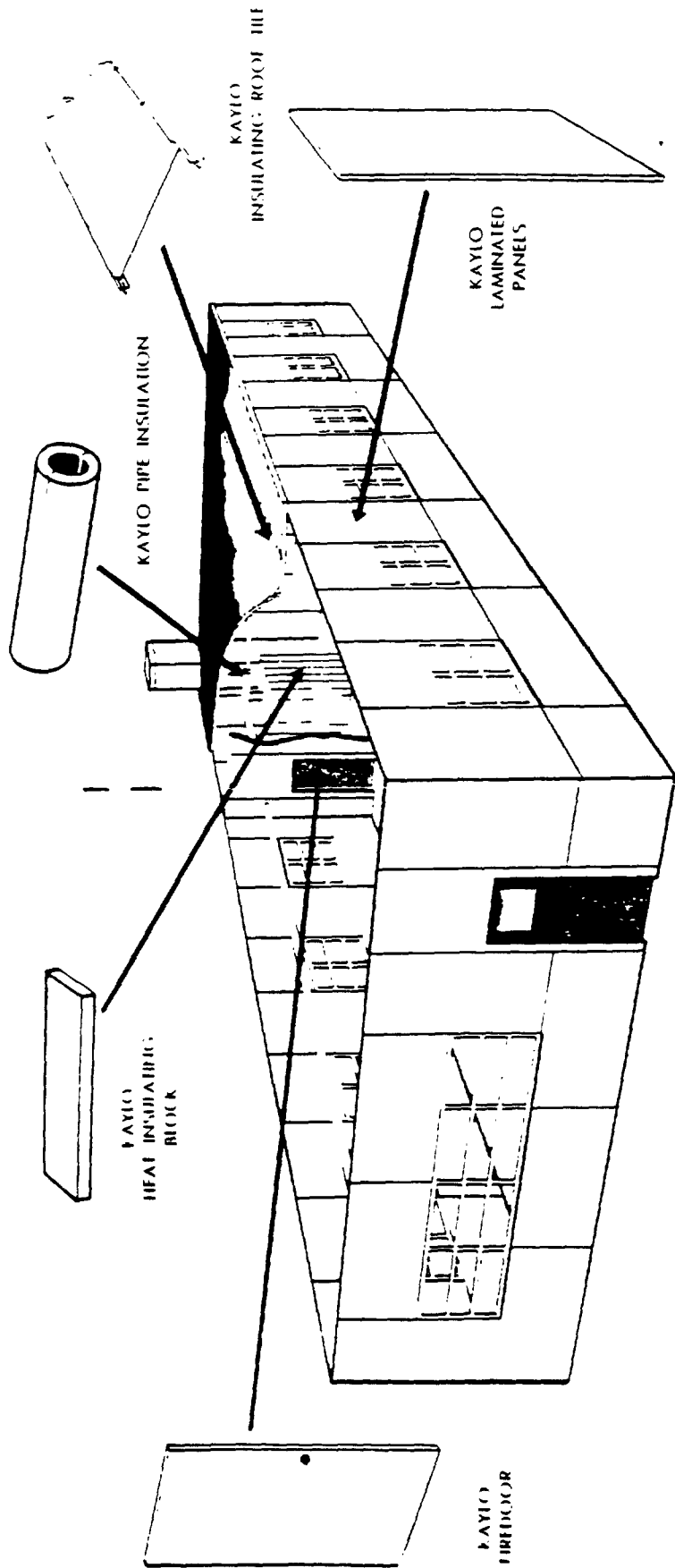
Thermal density (11 pounds per cubic foot) is used where heat insulating value is the primary need and mechanical strength secondary but still important. Thermal Kaylo density material is approximately 99 per cent air by volume, but the air spaces are too small to be seen.

Structural Density

Structural density (20 pounds per cubic foot) is used where additional 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, fire doors, 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 advanced pipe, 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 bundle 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 1/4 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.

Tube and Pipe Sizes from 1/4 to 72 inches
in Diameter



100% KAYLO



100% KAYLO

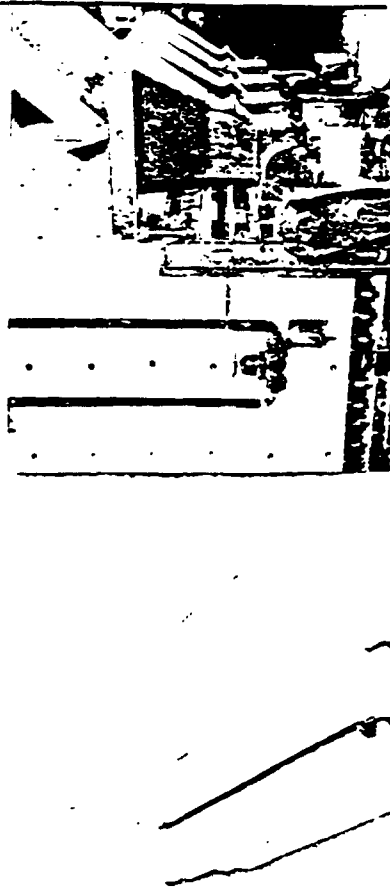


100% KAYLO

100% KAYLO



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 in. 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 in. 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 6 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 slingles.

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.

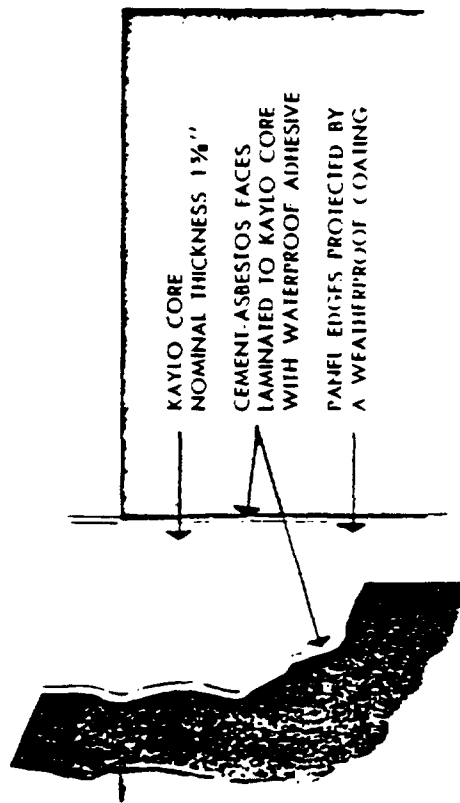
The smooth under-surface of Kaylo Insulating Roof Tile has a light reflection factor of approximately 80 per cent. Note the lightweight supporting structure made possible by a Kaylo roof deck.



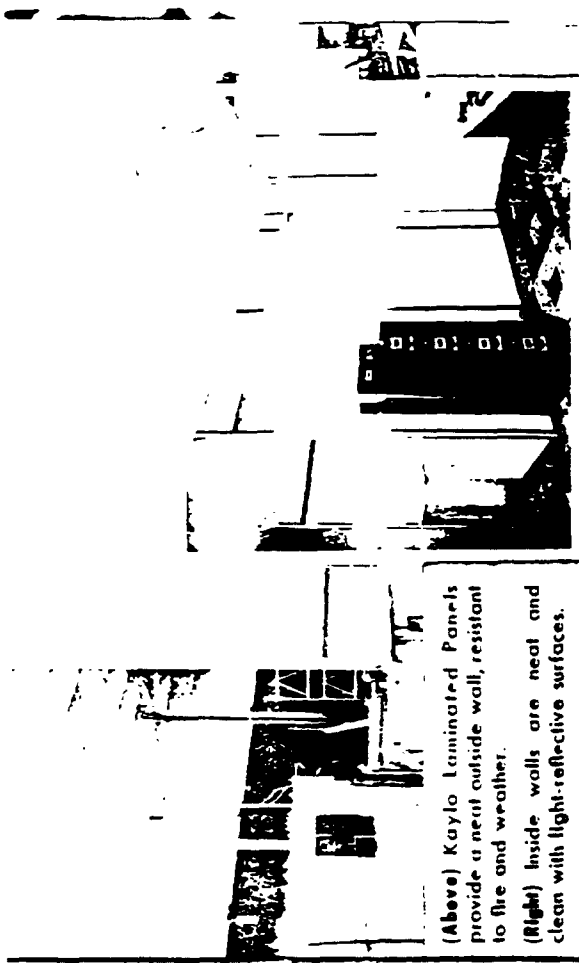
KAYLO Laminated Panels

Kaylo is made of structural density 170 pounds per cubic foot cement concrete in panels faced with wood veneer, cement asbestos facing 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 facing, provide complete protection on non-load bearing partition sections which require no fire lining on either side, no painting, facing, plastering, ceiling or insulation. While not required, paint may be applied to the exterior by conventional means.

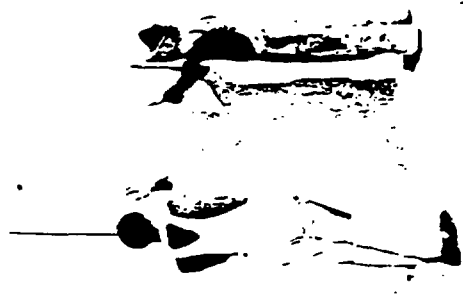


(Above) Kaylo Laminated Panels provide a neat outside wall, resistant to fire and weather.
(Right) Inside walls are neat and clean with light-reflective surfaces.

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.

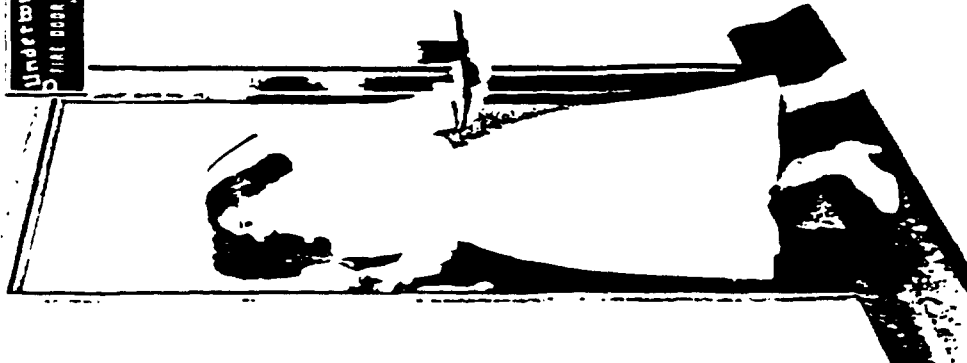
Easy to Erect

Each standard 4 x 8 foot panel with cement asbestos facing provides a complete wall section 12 square feet in area which weighs only about 200 pounds. Two men can erect one of the panels in a few minutes. A brick wall of the same area would require 116 individually laid bricks and weigh about 2,000 pounds.



KAYLO Firedoors

Underwriters Laboratories Inc.
FIRE DOOR FOR OPENING IN HEAVY DUTY



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 such fire in beauty.

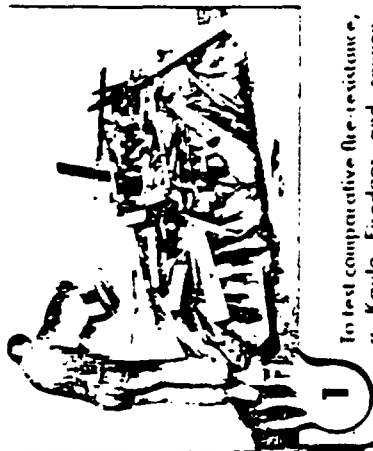
Insulating Value—Installed in an exterior opening with weather stripping, the Kaylo Firedoor insulates more effectively than a conventional door, *plus* a storm door.

Dimensional Stability—A Kaylo Firedoor does not warp, swell or shrink even when subjected to extremes of heat or cold, dampness or dryness.

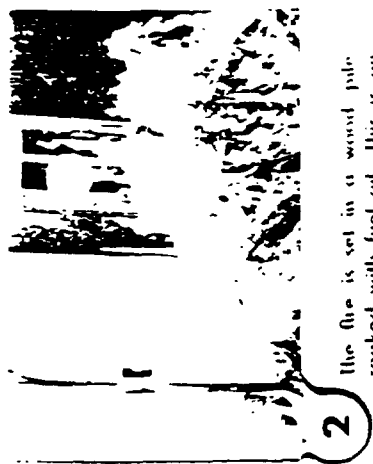
Light Weight Plus Strength—A standard 3'4" x 7' Kaylo Firedoor weighs only 90 pounds, but can support an 8,000 pound distributed load with only one half inch deflection while loaded. After unloading it returns to its original position.



...that an doors means rated fire protection, safely
...reduced insurance rates for building owners. It
...every Kaylo Firedoor.



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.



The fire is set in a wood pole soaked with fuel oil. This is an untouched photograph of the "hot side" after less than 10 minutes direct exposure to flame.



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 the troops

KAYLO® *Building and Insulating Products*

Members of a Distinguished Family of

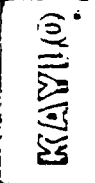
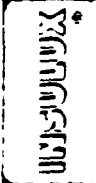
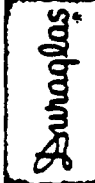


Quality Products

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 this 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.

	● BUILDING AND INSULATING PRODUCTS
	● STRUCTURAL GLASS BLOCK
	● CONTAINERS
	● CLOSURES AND PLASTIC PRODUCTS
	● LABORATORY AND SPECIAL GLASSWARE
	● TABLE GLASSWARE
	● GLASS INSULATORS
	● COATED BOARD ● FOLDING CARTONS
	● ALL-GLASS TELEVISION BULBS

OWENS  ILLINOIS
GLASS COMPANY
Toledo, I. Ohio

With your help

Owens-Illinois Glass Company

makes and sells

Quality Products



O w e n s - I l l i n o i s G l a s s C o m p a n y

. 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 labeled "shoes and ships and sealing

wax" is a small inventory compared to the amount you

variety of goods and services required to

run a business like ours.

Among other things we buy in large

quantities:

Abrasive
Accounting
Acetylene
Acids
Adhesives
Advertising
Alkali
Aluminum Sheet
Arsenic
Asbestos
Automobiles
Banking
Barium Carbonate
Bearings
Belling
Blue Prints
Boilers
Borax
Boxes
Brick
Bristles
Building Materials
Building Rentals
Burnets
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
Furnaces
Fuel Oil
Furniture

Gasoline
Gears
Gloves
Glass Fiber
Gummed Tape
Gypsum
Hardware
Hose
Insulation
Insurance
Laboratory Equipment
Lacquers
Lacal
Lime
Limestone
Locks
Lubricating Oils
Lumber
Machinery
Machine
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 Processes
Printing
Public Address
Systems
Pulleys
Pumps
Quartz
Refractory
Materials
Reptiles
Regulators
Rubber
Sand
Salt

Scale
Selenium
Sheet Metal
Sulf. Carbon
Sundering
Soda Ash
Springs
Sparklers
Starch
Steel
Sulphur
Telephone
Telephone
Tin Plate
Tools
Tractors
Transformers
Transportation
Trucks
Typewriters
Vac Lanes
Warehousing
Waste Paper
Watches
Water
Welding
Wire

Many of our suppliers are

our customers, too.

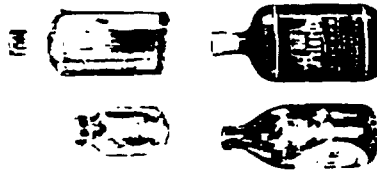
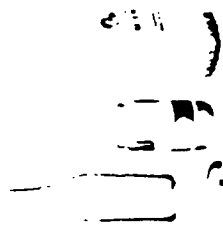
We sell them

glass containers • closures

For manufacturer or processor who needs a product which requires packaging, should be acquainted with the many advantages which are offered by Owens-Illinois containers and closures made by Owens-Illinois.

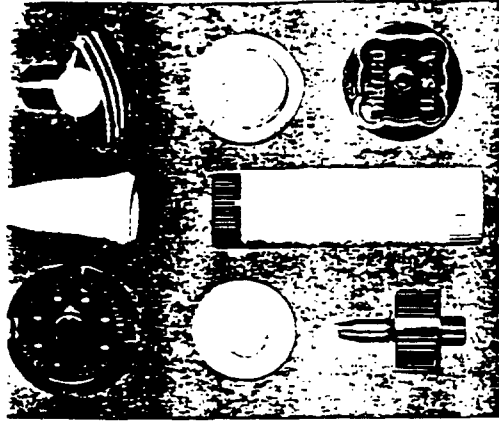


If you now are using packages made of some other material, Owens-Illinois can help you be able to demonstrate that Owens-Illinois containers and closures could do a better packaging job for your product than you are able to. Let our packaging specialists help you look into our problem.



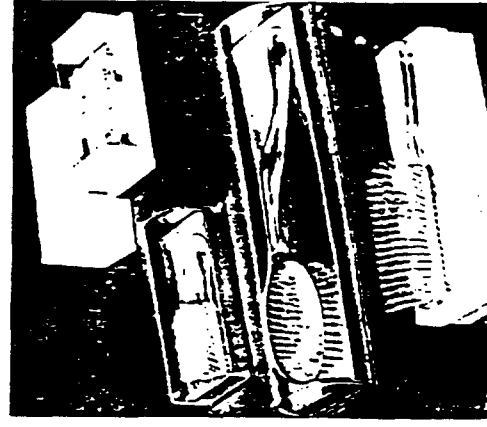
plastic products

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 head is anchored in the head of the brush.

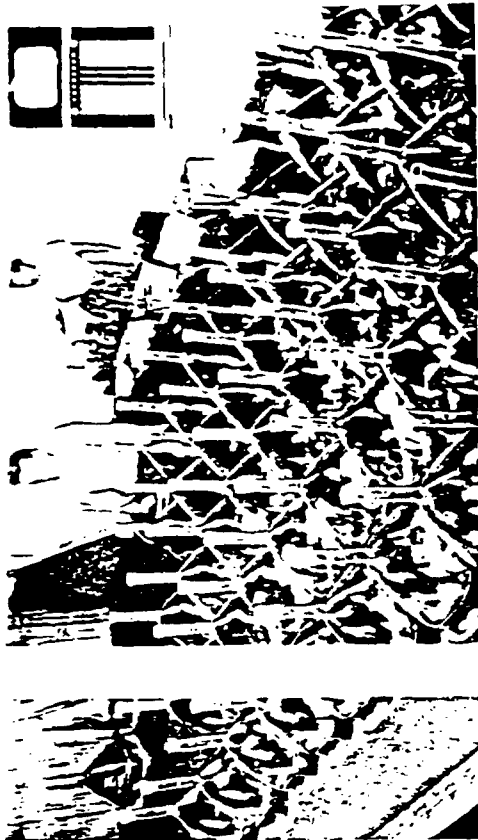
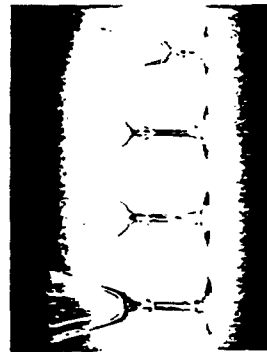
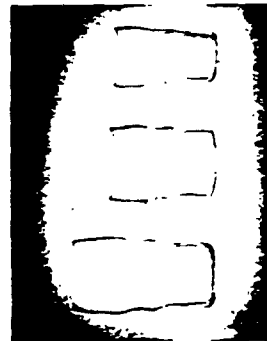




tableware

Every manufacturing plant which has food service facilities for its employees needs the kind of fine Sateledge glass drinking tumblers which are made by Owens Illinois' Lobbey Glass Division.

If your industry uses premiums as a part of your merchandising, Lobbey 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 Lobbey guarantee: "A new glass if Sateledge ever chips."

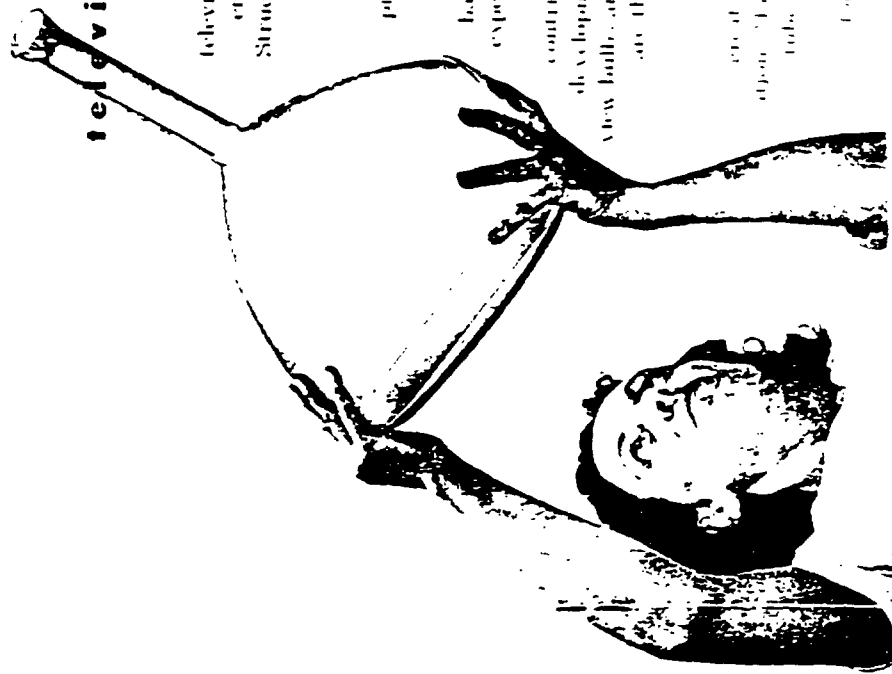


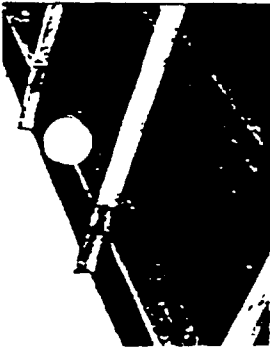
television bulbs

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 constructive new industry and has contributed greatly to its rapid development. The all-glass direct-view bulbs are made in a tube which is the very heart of television.

Over 100,000,000 bulbs are turned out in great quantities. They are made in one of the largest glass tube manufacturing plants in the world, where the latest equipment is used for the all-glass production.





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 combine 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.



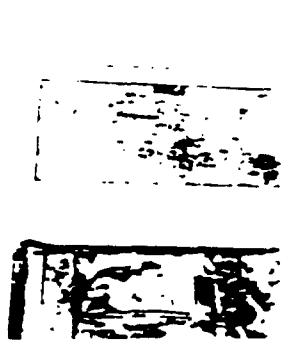
heat insulating block

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.



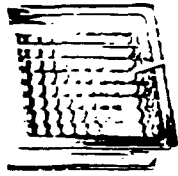
laminated panels

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 breaking value, light weight, fire resistance and stability.



fireproof doors

Kaylo Fireproof Doors, like every one 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.



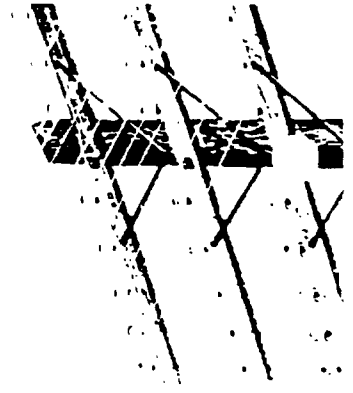
plywood products

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.



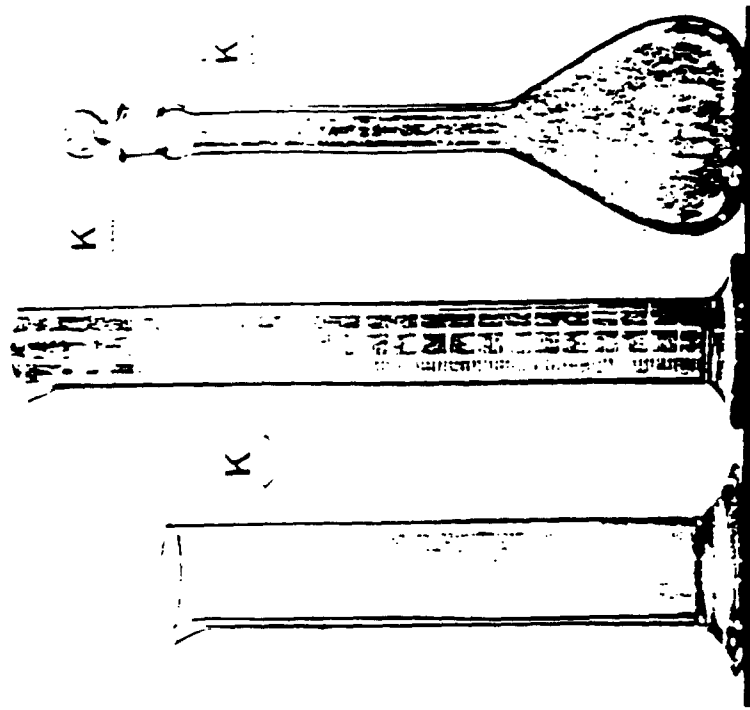
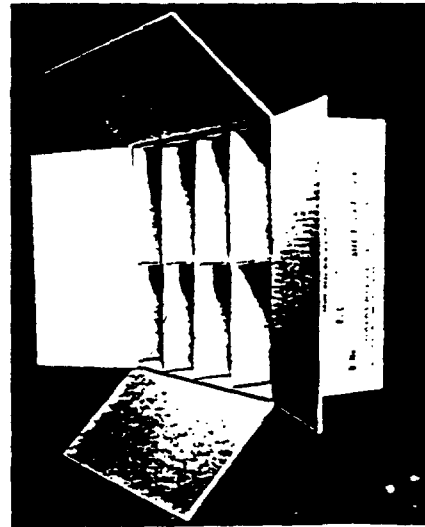
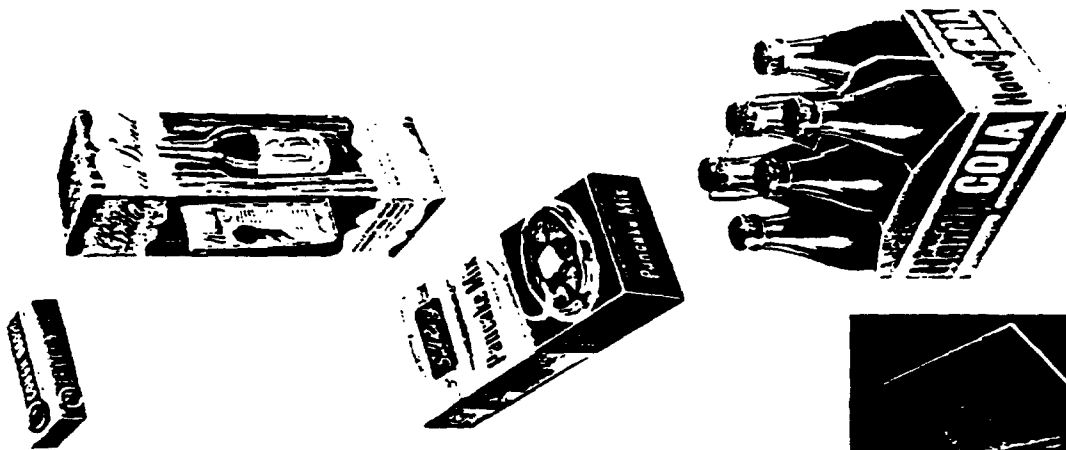
insulators

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 become shape-flaking. Insulators are made by Owens-Illinois.



cartons

For more than 20 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 Corrugating Mills, one of the country's leading manufacturers of high quality folding cartons and clay coated folding box board. American Corrugating 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; all clay coated folding boxboard and all of the various grades of combination folding boxboard



laboratory and scientific ware

Laboratory and Scientific Glass ware 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 de-

veloped 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 provide the quality of Kimble products for your laboratory, policy today and to anticipate your needs.

owens

containers and closures



plastic products



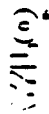
laboratory (chemical & special) containers



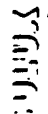
table and premium glassware

INGRAY

glass insulators



insulating and building products



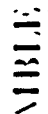
glass block



coated board & folding cartons



bristle and nylon brushes



all-glass television bulbs

*Perhaps you have
requirements which
we could supply.*

We invite an inquiry.

OWENS-ILLINOIS GLASS COMPANY

Dept. 55, Box 1035

Toledo 1, Ohio

SCHIFF HARDIN & LAITE

A Partnership Including Professional Corporations

7200 Sears Tower, Chicago, Illinois 60606-6473
Telephone (312) 876-1000 Facsimile (312) 258-5600

Chicago
Washington
New York
Peoria
Merrillville

Matthew J. Fischer
(312) 258-5591

August 19, 1996

James Wylder
James Walker, Ltd.
207 West Jefferson
P.O. Box 3455
Bloomington, IL 61702-3455

Re: Keilhack, No. 92 L 212

Dear Jim:

I have enclosed Owens-Illinois, Inc.'s Amended and Supplemental Answers to Plaintiffs' First Set of Interrogatories and Owens-Illinois' Amended and Supplemental Responses to Plaintiff's First Request for Discovery. In addition, I have enclosed some documents that are referenced in the Answers and Responses. These documents include a list of all the asbestos-related lawsuits filed against Owens-Illinois prior to January 1, 1980, two descriptions of the position of "medical director" at Owens-Illinois, a summary of the sworn testimony given by Steven M. Ayres, M.D. on behalf of Owens-Illinois, and lists of all the officers and directors of Owens-Illinois since 1935. The list of last known addresses for these individuals is still being compiled and will be sent to you as soon as it is completed.

As I am sure you will appreciate, many Owens-Illinois employees and outside counsel have spent considerable time and effort preparing these responses and we have made a concerted attempt to comply with Judge Witte's Order. If, upon examining our responses, you feel that more or different information is called for, please let Joe O'Hara or me know so that we can discuss your concerns.

AUG 22 1996 *me*

James Wylder
August 19, 1996
Page 2

Lastly, Owens-Illinois has offered to make certain documents available for your review upon request. This option is offered primarily in situations where we believe you already possess the documents in question or where the documents are not readily available. If you would like to review these documents, please let me know and I will make the necessary arrangements.

Sincerely,

A handwritten signature in black ink, appearing to read "Matthew J. Fischer", written in a cursive style.

Matthew J. Fischer

MJF/vlb
Enclosures

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