6. Use of the light field optical counting method should be restricted to evaluating mineral dusts for which suitable chemical methods of analysis are not available.
7. More accurate physiological information concerning the effect of concentration, particle size, surface area and solubility is needed to expedite the development of new evaluation procedures.
8. Methods now available for estimating the silica content of airborne dust samples will be inadequate when more precise total dust evaluation methods are developed.
9. Methods used by industrial hygienists for evaluating particle distribution are for the most part obsolete. Techniques developed for use in other fields of study should be applied to this industrial hygiene problem.

Committee members:

Dr. H. H. Schrenk, *Chairman*
Dr. J. Shilen
Mr. L. F. Garber
Mr. C. E. Couchman
Mr. F.R. Ingram

1950

Report of the committee on threshold limits*

DR. L.T. FAIRHALL (U.S. Public Health Service): The Committee on Threshold Limits has this year proposed a few changes in the values from those previously reported and has made a few suggestions which I take pleasure in reporting.

It is suggested that more attempt should be made on the part of those reporting original work to define safe working conditions, that is, permissible concentration values to which workers may be exposed. All too frequently original work on the toxicity of a given substance fails to take into account the possible need for such data and it requires much study to arrive at any conclusion regarding its usefulness for inclusion in a table of threshold limit concentrations.

At the present time there is a great deal of interest in a number of organic insecticides, some of which are very poisonous indeed. It is also a matter of increasing interest to the industrial hygienist and is being brought to his attention by fatal and near-fatal cases in industry as well as in the application of these materials. It is in question how far we feel we should enter into this field and whether we should consider the matter of threshold limits for such insecticides. Also, it is complicated by the fact skin absorption occurs in many cases as well as injury from inhalation.

The changes in the Table which the Committee recommends for the present year are as follows:

1. Gamma radiation should be placed at 0.3 roentgen per week in place of 0.1 roentgen per day.
2. X-ray radiation should be placed at 0.3 roentgen per week in place of 0.1 roentgen per day.
3. o-Dinitro cresol should be added to the table with a value of 0.2 milligram per cubic meter of air.
4. n-Butanol should be changed from 50 parts per million to 100 parts per million.
5. It is also suggested that the hygienic significance of tripoli should be reviewed for future inclusion in the Table.

In connection with its review of the threshold limit values hitherto reported, the Committee has undertaken the special task of bringing the significant information (concerning these substances) together in permanent form. "Documentation," I believe is the term in current parlance. This enormous task could not, of course, be completed in one year. However, twenty-five substances have been reviewed, and the references together with the abstracted material have been compiled. It is to be hoped that future committees will continue this work, as this will eventually constitute a valuable set of reference material for the individual members of the Conference.

* Published in *Transactions of the Twelfth Annual Meeting of the American Conference of Governmental Industrial Hygienists*, April 22-25, 1950, Chicago, IL, pp. 33-34.

Threshold Limit Values

Adopted at the April 1950 meeting of the American Conference of Governmental Industrial Hygienists in Chicago. Reprinted from the *Archives of Industrial Hygiene and Occupational Medicine* 2:98-100 (July 1950).

Gases and Vapors

Substance	P.P.M.
Acetaldehyde	20
Acetic acid	10
Acetic anhydride	5
Acetone	500
Acrolein	0.5
Acrylonitrile	20
Ammonia	100
Amyl acetate	200
Isoamyl alcohol	100
Aniline	5
Arsine	0.05
Benzine (benzol)	35
Bromine	1
1,3-Butadiene	1000
n-Butanol	100
2-Butanone	250
n-Butyl acetate	200
Butyl cellosolve® (2-Butoxyethanol)	200
Carbon dioxide	5000
Carbon disulfide	20
Carbon monoxide	100
Carbon tetrachloride	50
Cellosolve® (2-Ethoxyethanol)	200
Cellosolve® acetate	100
Chlorine	1
Chlorobenzene	75
2-Chlorobutadiene	25
Chloroform	100
1-Chloro-1-nitropropane	20
Cyclohexane	400
Cyclohexanol	100
Cyclohexanone	100
Cyclohexene	400
Cyclopropane (propene)	400
o-Dichlorobenzene	50
Dichlorodifluoromehtane	1000
1,1-Dichloroethane	100
1,2-Dichloroethane (ethylene dichloride)	75
1,2-Dichloroethylene	200
Dichloroethyl ether	15
Dichloromethane	500
Dichloromonofluoromethane	1000
1,1-Dichloro-1-nitroethane	10
1,2-Dichloropropane (propylene dichloride)	75
Dichlorotetrafluoroethane	1000
Dimethylaniline	5
Dimethylsulfate	1
Dioxane	100
Ethyl acetate	400
Ethyl alcohol	1000
Ethyl benzene	200
Ethyl bromide	200
Ethyl chloride	1000
Ethylene chlorohydrin	5
Ethylene oxide	100
Ethyl ether	400
Ethyl formate	100
Ethyl silicate	100
Fluorotrichloromethane	1000
Formaldehyde	5
Gasoline	500
Heptane	500
Hexane	500
Hydrogen chloride	5
Hydrogen cyanide	10
Hydrogen fluoride	3
Hydrogen selenide	0.05
Hydrogen sulfide	20
Iodine	1
Isophorone	25
Mesityl oxide	50
Methanol	200
Methyl acetate	200
Methyl bromide	20
Methyl butanone	100
Methyl cellosolve® (2-methoxyethanol)	25
Methyl cellosolve® acetate	25
Methyl chloride	100
Methylcyclohexane	500
Methylcyclohexanol	100
Methylcyclohexanone	100
Methyl formate	100
Methyl iso-butyl ketone	100
Naphtha (coal tar)	200
Naphtha (petroleum)	500
Nickel carbonyl	1
Nitrobenzene	1
Nitroethane	100
Nitrogen oxides (other than N_2O)	25
Nitroglycerin	0.5
Nitromethane	100
2-Nitropropane	50
Nitrotoluene	5
Octane	500
Ozone	1
Pentane	1000
Pentanone (methyl propanone)	200
Phosgene	1
Phosphine	0.05
Phosphorus trichloride	0.5
Iso-propyl alcohol	400
Propyl acetate	200
Iso-propyl ether	500
Stibine	0.1
Stoddard solvent	500
Styrene monomer	200
Sulfur chloride	1
Sulfur dioxide	10

Substance	P.P.M.
1,1,2,2-Tetrachloroethane	5
Tetrachloroethylene	100
Toluene	200
Toluidine	5
Trichloroethylene	100
Turpentine	100
Vinyl chloride	500
Xylene	200

Toxic Dusts, Fumes and Mists

Substance	Mg. Per Cu. M.
Antimony	0.5
Arsenic	0.5
Barium	0.5
Cadmium	0.1
Chlorodiphenyl	1
Chromic acid and chromates, as CrO_3	0.1
Cyanide, as CN	5
Dinitrotoluene	1.5
o-Dinitrocresol	0.2
Fluoride	2.5
Iron oxide fume	15
Lead	0.15
Magnesium oxide fume	15
Manganese	6
Mercury	0.1
Pentachloronaphthalene	0.5
Pentachlorophenol	0.5
Phosphorus (yellow)	0.1
Phosphorus pentachloride	1
Phosphorus pentasulfide	1
Selenium, as Se	0.1
Sulfuric acid	1
Tellurium	0.1
Tetryl	1.5
Trichloronaphthalene	5
Trinitrotoluene	1.5
Zinc oxide fume	15

Mineral Dusts

Substance	M.P.P.C.F.
Alundum	50
Asbestos	5
Carborundum	50
Dust (nuisance, no free silica)	50
Mica (below 5% free silica)	50
Portland cement	50
Talc	20
Silica	
high (above 50% free SiO_2)	5
medium (5 to 50% free SiO_2)	20
low (below 5% free SiO_2)	50
Slate (below 5% free SiO_2)	50
Soapstone (below 5% free SiO_2)	20
Total dust (below 5% free SiO_2)	50

Substance	M.P.P.C.F.
Radiations	
Material or Radiation	
Gamma (roentgens per week)	0.3
Radon (curies per cubic meter)	10^{-8}
Thoron (curies per cubic meter)	10^{-8}
Roentgen ray (roentgens per week)	0.3

Committee members:

L.T. Fairhall, *Chairman*
Dr. Joseph Shilen
Mr. L. F. Garber
Mr. C. E. Couchman
Mr. F. R. Ingram

1951

Report of the committee on threshold limits*

DR. W.G. FREDRICK, Chairman (Detroit City Department of Health): Your Committee has received scanty correspondence from the membership this year, indicating, perhaps, reasonable satisfaction with values established to date.

Information available at the present time remains inadequate for establishment of limits for insecticides in air.

A real need has developed for a threshold limit value for noise or sound and it is believed that a value can be established soon. Similarly, it now appears that sufficient data have been accumulated to permit setting up limit values for radioactive isotopes, beryllium and uranium. It is recommended that the chairman of this committee appoint sub-committees of special experience and qualifications to assist in this work.

The changes in the Table which the Committee recommends for the present year are as follows:

* Published in *Transactions of the Thirteenth Annual Meeting of the American Conference of Governmental Industrial Hygienists*, April 21-25, 1951 Atlantic City, NJ, pp. 27-28.

1. The value for Mica dust shall be 20 M.P.P.C.F.
2. The value for Radium 226 in air shall be 8 $\times 10^{-6}$ micro curies per cubic meter.
3. The value for Polonium 210 in air shall be 1×10^{6} micro curies per cubic meter.

Committee members:

W. G. Fredrick, *Chairman*
K. E. Charron
K. E. Markuson
Arthur Vorwald

1952

changes from 1951

The following new threshold limit values are recommended for addition to the 1951 list (NV).

Cresol	5 ppm
Di-ethyl amine	25 ppm
Ethyl amine	25 ppm
Methylal	1000
Phenol	

Deletions

Radon (curies per cubic meter)	10^{-9}
Thoron (curies per cubic meter)	10^{-9}
Radium 226 (microcuries per cubic meter)	10^{-4}
Polonium 210 (microcuries per cubic meter)	10^{-4}

Committee members:

Allan L. Coleman, *Chairman*
D. H. Byers
L. T. Fairhall
Kingsley Kay
Arthur J. Vorwald
L. F. Weller

1953

changes from 1952

The following is the first proposed preface for the MAC values.

"Values are given in the following tables for the maximum average atmospheric concentration of contaminants to which workers may be exposed for an eight-hour working day without injury to health.

"These values are based on the best available information from industrial experience, from experimental studies and, when possible, from the combination of both. They are not fixed values, but are reviewed annually by the Committee on Threshold Limits for changes, revisions or additions as further information becomes available. Threshold limits should be used as guides in the control of health hazards and should not be regarded as fine lines between safe and dangerous concentrations. They represent conditions only within which it is felt that workers may be repeatedly exposed, day after day, without adversely affecting their health. It is felt, at the present time, that workers should not be exposed to a working environment containing any of these substances in excess of the value indicated."

New Values

1,2-Dibromoethane (ethylene dibromide) — 25 ppm
Fluorine (gas) — 0.1 ppm 1,1,1-Trichloroethane (methyl chloroform) — 500 ppm
0,0-Diethyl-0-p-nitrophenyl thiophosphate (parathion) — 0.1 ppm
Uranium (soluble compounds) — 0.05 mg/m^3
Uranium (insoluble compounds) — 0.25 mg/m^3

Revised Values

Acetone — 1000 ppm
Carbon tetrachloride — 25 ppm
1,2-Dichloroethane (ethylene dichloride) — 100 ppm
Tetrachloroethylene — 200 ppm
Trichloroethylene — 200 ppm

Committee members:

Allan L. Coleman, *Chairman*
William L. Ball
L. T. Fairhall
Kingsley Kay
H. E. Stokinger
A. J. Vorwald
Louis F. Weller

1954

changes from 1953

Revised Values

Nickel carbonyl — 0.001 ppm
Nitrogen oxides (other than N_2O) — 25 ppm
  Change to: Nitrogen dioxide — 5 ppm
Ozone — 0.1 ppm

Change in listing

n-Butanol — 100 ppm
  TO: n-Butyl alcohol — 100 ppm
Methyl butanone
  TO: Hexanone (methyl butyl ketone) — 100 ppm
Portland cement
  TO: Cement
Selenium, as Se
  TO: Selenium compounds, as Se — 0.1 mg/m^3

Deletions

Dichloromethane — 500 ppm
Radiations and radioactive substances

Excerpt from the 1954 committee report*

In view of several inquiries received during the year, on the subject of air pollution, your Committee considers it desirable to add the following statement to the section introducing the list of threshold limit values published annually.

"These values are not intended for use, or for modification for use, in the evaluation or control of community air pollution or air pollution nuisances."

In addition to the recommended changes mentioned above, your Committee suggests the adoption of a new procedure in the compilation of the table of threshold limit values. The established list would be continued in its present form, but would be supplemented by a second list known as "Tentative Threshold Limit Values" because of the lesser certainty associated with the values assigned. The adoption of this tentative list is suggested for the following reasons:

1. It is felt that a need exists for such a list.
2. Tentative values based on even limited information are felt to provide at least general guidance in the control of exposure.
3. Long intervals often elapse between the development of the first experimental data and its practical industrial experience from which many values have been assigned in the past.
4. The tentative list would serve as a clearing house until such time as the values were more definitely established.

It is suggested that all new values be placed on this tentatvie list before their appearance on the list of values approved by the Conference.

The following is a list of 37 material and tentative values presented by your committee for further study and consideration.

Substance	(ppm)
Allyl alcohol	5
Allyl propyl disulfide	2
Benzyl chloride	1
Diacetone alcohol (4-Hydroxy-4-methyl pentanone-2)	50
Di isobutyl ketone	50
Furfural	5
Mercaptans	
Methyl mercaptan	50
Ethyl mercaptan	250
Butyl mercaptan	10
Perchlormethyl mercaptan	0.1
Methyl isobutyl carbinol (methyl amyl alcohol)	25
p-Nitroaniline	1

Pesticides	(mg/m^3)
Organic Phosphates	
Parathion (O,O-diethyl O-p-nitrophenyl thiophosphate	0.1
TEPP (tetraethyl pyrophosphate)	0.05
TEDP (tetraethyl dithiono pyrophosphate)	0.2
EPN (ethyl-p-nitrophenyl thiono benzene phosphonate	0.5
Malathion (O,O-dimethyl dithio phosphate of dimethyl mercaptosuccinate	15
Chlorinated Hydrocarbons	
Lindane (hexachlorocyclohexane)	0.5
DDT (1,1-dichloro-2,2-bis (p-chlorophenyl) ethylene	1
Chlordane (4,7-methano-3a,4,7,7a-tetrahydro-4,5,6,7,8,8-hexachlorindene)	2
Aldrin (1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene)	0.25

* Full text published in the *Transactions of Sixteenth Annual Meeting*, April 24-27, 1954, Chicago, IL, pp. 22-24.

Pesticides	(mg/m³)
Dieldrin (1,2,3,4,10,10-hexachloro-6,7, epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4,5,8-dimethanonaphthalene)	0.25
Methoxychlor (2,2,diparamethoxyphenyl-1,1,1-trichloroethane)	15
Inorganic Compounds	
Calcium arsenate	0.3
Lead arsenate	0.2
Organo mercurials (as mercury)	0.01
Organic Herbicides	
2,4,D (2,4-dichlorophenoxyacetic acid)	10
Ammate (ammonium amidosulfate)	15
Crag Herbicide (sodium-2,4,dichlorophenoxy ethyl sulfate)	15
Phenylhydrazine (ppm)	5
Picric acid (mg/m³)	10
Pyridine (ppm)	10
Sodium hydroxide (mg/m³)	2
Sulfur hexafluoride (ppm)	1000
Sulfur pentafluoride (ppm)	0.025
Titanium dioxide (mg/m³)	15
Vanadium (mg/m³)	
(V_2O_5 dust)	0.5
(V_2O_5 fume)	0.1
Ferro vanadium dust	1

Reference material has been prepared on each of the above substances and, though in some instances rather meager, is available from the chairman for distribution. The Committee would welcome suggestions of substances to be added and also comments, additional references or experience with these materials.

Committee members:

Same as 1953.

1955

changes from 1954

New Values

None.

Revised Values

None.

Committee members:

Same as 1953.

1956

changes from 1955

Threshold Limit Values adopted at the Eighteenth Annual Meeting of the American Conference of Governmental Industrial Hygienists, April 21-24, 1956, Philadelphia, PA.

New Values

Gases and Vapors	ppm	mg/m³
Allyl alcohol	5	12
Allyl propyl disulfide	2	12
Benzyl chloride	1	5
Butylamine	5	15
Chlorine Trifluoride	0.1	0.4
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	50	240
Diborane	0.1	0.1
Difluoro dibromomethane	100	860
Diisobutyl ketone	50	290
Ethylenediamine	10	30
Ethylene imine	5	9
Hydrazine	1	1.3
Hydrogen bromide	5	17
Hydrogen peroxide, 90%	1	1.4
Isopropylamine	5	12
Methyl acetylene	1000	1650
Methyl isobutyl carbinol (methyl amyl alcohol)	25.	100
p-Nitroaniline	1	6
Phenylhydrazine	5	22
Propylene imine	25	60
Pyridine	10	30
Sulfur hexafluoride	1000	6000
Sulfur pentafluoride	0.025	0.25
p-Tertiary butyltoluene	10	60
Tetranitromethane	1	8
Trifluoromonobromo methane	1000	6100

Toxic Dusts, Fumes and Mists	mg/m³
Aldrin (1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4,5,8-dimethanonaphthalene	0.25
Ammate (ammonium sulfamate)	15
Cadmium oxide fume	0.1
Chlordane (1,2,4,5,6,7,8,8 octachloro-3a,4,7,7a-tetrahydro-4,7-methaniondane	2.0
Chlorinated diphenyl oxide	0.5
Crag herbicide (sodium 2-(2,4-dichloro-phenoxy) ethanol hydrogen sulfate	15
2,4-D(2,4-dichlorophenoxyacetic acid)	10
Dieldrin (1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4,5,8-dimethano-napthalene)	0.25
EPN (o-ethyl o-p-nitrophenyl thionobenzene phosphonate)	0.5
Ferrovandium	1

Toxic Dusts, Fumes and Mists	mg/m³
Hydroquinone	2
Lindane (hexachlorocyclohexane, gamma isomer)	0.5
Malathion (O,O-dimethyl dithiophosphate of dimethylmercapto succinate)	15
Mercury (organic compounds)	0.01
Methoxychlor (2,2-di-p-methoxy-phenyl-1,1,1-trichlorethane	15
Molybdenum (soluble compounds)	5
Picric acid	0.1
Sodium hydroxide	2
TEDP (tetraethyl dithionopyro-phosphate)	0.05
TEPP (tetraethyl pyrophosphate)	0.05
Titanium dioxide	15
Vanadium	
(V_2O_5 dust)	0.5
(V_2O_5 fume)	0.1
Zirconium compounds (as Zr)	5

Revised Values

Iodine changed from 1 ppm to 0.1 ppm

Deletions

Cadimum (0.1 mg/m³)

EDITOR'S NOTE: In 1956 the value "approximate milligram per cubic meter" appeared for the first time.

Committee members:

Allan L. Coleman, *Chairman*
William L. Ball
L. T. Fairhall
H. E. Stokinger
Ralph S. Smith
W. H. Reinhart
S. D. Silver
A. J. Vorwald

1957

changes from 1956

Threshold Limit Values adopted at the Nineteenth Annual Meeting of the American Conference of Governmental Industrial Hygienists, April 20-23, 1957, St. Louis, MO.

New Values

Gases and Vapors	ppm	mg/m³
Allyl chloride	5	15
Chloropicrin	1	7
Decaborane	0.05	0.3
Ethylacrylate	25	100
Furfural	5	20
Methyl acrylate	10	35
Nitric acid	5	25
Tetrahydrofuran	200	590

Toxic Dusts, Fumes, and Mists	mg/m³
ANTU (alpha-naphthyl-thiourea)	0.3
Calcium arsenate	0.1
Chlorinated camphene, 60%	0.5
Chlorodiphenyl (54% chlorine)	0.5
DDT (2,2-bis (p-chlorophenyl)-1,1,1-trichloroethane)	1
Dinitrobenzene	1
Ferban (ferric dimethyl dithiocarbamate)	15
HETP (hexaethyl tetraphosphate)	0.1
Lead arsenate	0.15
Nicotine	0.5
Pyrethrum	2
Rotenone	5
Sodium fluoroacetate (1080)	0.1
Strychnine	0.15
Thiram (tetramethyl thioram disulfide)	5
Warfarin (3-(α-acetonyl benzyl)-4-hydroxycoumarin)	0.5

Revised Values

Substance		ppm	mg/m³
Benzene	from	35	110
	TO	25	80
Butyl cellosolve	from	200	970
	TO	50	240
Ethylene dioxide	from	100	180
	TO	50	90
Lead and inorganic compounds	from	—	0.15
	TO	—	0.2
Styrene monomer (Phenylethylene)	from	200	850
	TO	100	420
Sulfur dioxide	from	10	25
	TO	5	13
Thallium (soluble comps)	from	—	0.15
	TO	—	0.1

Deletions

Acrylonitrile (20 ppm and 45 mg/m³)
Dieldrin (0.25 mg/m³)
Slate (below 5% free SiO_2) (50 mppcf)
Total dust (below 5% free SiO_2) (50 mppcf)

Committee members:

Allan L. Coleman, *Chairman*
William L. Ball
W. Clarke Cooper

L. T. Fairhall
W. H. Reinhart
S. D. Silver
Ralph S. Smith
H. E. Stokinger

1958

changes from 1957

Threshold Limit Values adopted at the Twentieth Annual Meeting of the American Conference of Governmental Industrial Hygienists, April 19-22, 1958, Atlantic City, NJ.

New Values

Gases and Vapors

None.

Revised Values

Substance		ppm	mg/m³
Mesityl oxide	from	50	200
	TO	25	100
Nitric acid	from	5	25
	TO	10	25

Deletion

HETP (hexaethyl tetraphosphate)

Committee members:

Allan L. Coleman, *Chairman*
William L. Ball
W. Clarke Cooper
Hervey B. Elkins
Keith H. Jacobson
Warren H. Reinhart
Herbert E. Stokinger

1959

changes from 1958

Threshold Limit Values adopted at the Twenty-First Annual Meeting of the American Conference of Governmental Industrial Hygienists, April 18-21, 1959, Chicago, IL.

New Values

Gas and Vapors	ppm	mg/m³
Acetylene tetrabromide	1	14
Beryllium	—	20
Methyl styrene	100	480
Monomethyl aniline	2	9
Paradichlorobenzene	75	450
Propylene oxide	100	240
Tertiary butyl alcohol	100	300
Toluene-2-4-diisocyanate	0.1	0.7
Triethylamine	25	100
Vinyl toluene	100	480
Xylidine	5	25

Revised Values

Substance		ppm	mg/m³
Bromine	from	1	7
	TO	0.1	0.7
Chloroform	from	100	490
	TO	50	240
Chloropicrin	from	1	7
	TO	0.1	0.7

Deletions

Hexone (methyl isobutyl ketone)

Committee members:

Same as 1958.

1960

changes from 1959

Threshold Limit Values adopted at the Twenty-second annual Meeting of the American Conference of Governmental Industrial Hygienists, April 23-26, 1960, Rochester, NY.

New Values

Gases and Vapors	ppm	mg/m³
Boron Trifluoride	1	3
Chlorine dioxide	0.1	0.3
Dimethyl formamide	20	60
1,1-Dimethylhydrazine	0.5	1
Dipropylene glycol methyl ether	100	600
Furfural alcohol	5	20
Methyal (dimethoxymethane)	1000	3100
Lithium hydride	—	0.025
Phosphoric acid	—	1.0
Yttrium	—	5.0

Mineral and Non-Metallic Inorganic Dusts	mppcf
Crystabolite (above 5% silica)	5
Amorphous silica	20

SEP 13 1990

IN THE UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF TEXAS
HOUSTON DIVISION

M.A.D. 100

MASTER ASBESTOS FILE

PLAINTIFFS' INTERROGATORIES TO DEFENDANTS

TO: ALL DEFENDANTS and their attorneys of record

The plaintiffs hereby make request in accordance with Rule 33, Federal Rules of Civil Procedure that the defendants answer each and all of the attached interrogatories within thirty (30) days after the service of a copy hereof upon you. You are further notified that these interrogatories are continuing requiring supplemental answers as required by Rule 33.

TX TINER
RMC0024210

INTERROGATORY NO. 1. As to the person answering these interrogatories, state:

(a) Name.

(b) Title or position with defendant.

(c) Business address.

(d) Residence address.

(e) Length of time employed by defendant.

ANSWER:

INTERROGATORY NO. 2. State the following concerning this defendant:

(a) Full and correct name.

(b) Principal place of business.

(c) State of incorporation.

(d) Date of incorporation and name of corporation.

(e) Is this defendant authorized to transact business the State of Texas? If so, state the date such authority was first issued and last renewed.

(f) Does this defendant have an agent, representative or place of business in Texas? If so, state the name and address of such agent, representative, or place of business.

(g) Does this defendant have an agent for service in the State of Texas? If so, state the name and address of the registered agent.

ANSWER:

INTERROGATORY NO. 3.

Has this defendant been sued under its correct name? If not, state the correct legal name of the defendant and provide the information requested in No. 2 above concerning the defendant as correctly named.

ANSWER:

INTERROGATORY NO. 4. As to any product containing asbestos in any form, has this defendant:

(a) Ever designed such a product?

(b) Manufactured such a product?

(c) Processed such a product?

(d) Sold such a product?

(e) Distributed such a product?

(f) Patented such a product?

(g) Relabeled such a product which was manufactured, sold, or distributed by another company?

ANSWER:

INTERROGATORY NO. 5.

If your answer to No. 4d. and 4e. is "yes," then give the trade name of the product, the year the defendant first sold or distributed such product, and the year the defendant last sold or distributed such product.

ANSWER:

INTERROGATORY NO. 6.

In what year did the defendant first begin selling or distributing insulation products containing asbestos?

ANSWER:

INTERROGATORY NO. 7.

In what year did the defendant last sell the insulation product which contained asbestos?

ANSWER:

INTERROGATORY NO. 8.

For each asbestos containing insulation product manufactured or sold by you, please give the asbestos content by weight and by volume.

ANSWER:

INTERROGATORY NO. 9.

Has this defendant ever acquired another corporation, company, or business which manufactured, sold, processed, distributed or contracted to apply insulation products containing asbestos?

ANSWER:

INTERROGATORY NO. 10.

If the answer to Interrogatory No. 9 is "yes," then state the following concerning such predecessor:

(a) Full and correct name.

(b) The principal place of business.

(c) State of incorporation.

(d) Date of acquisition by defendant.

(e) Was this business authorized to transact business in the State of Texas?

(f) Attach copies of all papers pertaining to the acquisition.

ANSWER:

INTERROGATORY NO. 11

If your answer to No. 9 is "yes", then give the trade name of the product, the year such predecessor first sold or distributed such product, and the year such predecessor last sold or distributed such product.

ANSWER:

INTERROGATORY NO. 12.

In what year did the predecessor or acquired business begin selling or distributing insulation products containing asbestos?

ANSWER:

INTERROGATORY NO. 13.

In what year did the predecessor or acquired business last sell insulation products containing asbestos?

ANSWER:

INTERROGATORY NO. 14.

As to the named defendant or any predecessor or acquired business, state the various types of products such as blocks, pipe covering, cements, tape, spray-on insulation mastics, and cloth, and in connection with each type of product, state how the same was packaged (i.e., bags, boxes, sacks, etc.) for sale.

ANSWER:

INTERROGATORY NO. 15.

Have you since 1950 had designated distributors of your products in the State of Texas?

ANSWER:

INTERROGATORY NO. 16.

If your answer to Interrogatory No. 15 is "yes", then state the name of all companies, their addresses, and give the years that each was a designated distributor.

ANSWER:

INTERROGATORY NO. 17.

If you did not have designated distributors in the State of Texas, then state by what method sales were promoted, encouraged or consummated, and give the name and addresses of all sales offices located in the State of Texas.

ANSWER:

INTERROGATORY NO. 18.

Describe the purpose or purposes for which each of the products were designed, said type of products being as follows:

(a) Pipe covering.

(b) Blocks.

(c) Asbestos cloth.

(d) Mastics.

(e) Spray-on insulation.

(f) Rope or tape.

(g) Asbestos sheeting or millboard.

ANSWER:

INTERROGATORY NO. 19.

Did each of your insulation products or materials generally reach, or were packaged to reach, the consumer, insulation helper, insulation mechanic, or ultimate user, without substantial change in the condition in which it was sold?

ANSWER:

INTERROGATORY NO. 20.

Do you admit that asbestos insulation applicators, helpers or mechanics, were foreseeable users of defendant's asbestos-contained insulation products?

ANSWER:

INTERROGATORY NO. 21.

Based upon the material contents of your products, the method of manufacturing, and the method of application for the purpose of insulation, can your products be generally applied by an insulator without creating dust?

ANSWER:

INTERROGATORY NO. 22.

Please desribe in detail each test that you performed on your asbestos containing insulation products to determine whether persons applying the products would be exposed to bodily injury or disease as a result of applying those products. In connection with this interrogatory, include in your answer the date the test was made, the circumstances under which the test was made, the results of the test, and the name and address of the person or persons who have custody of the documentary evidence supporting the tests.

ANSWER:

INTERROGATORY NO. 23:

Did your company, or any predecessor, ever at any time give insulation contractors, insulation helpers, or insulation mechanics who would be using or applying your products instructions concerning safety precautions to use in applying such procedure? If so, describe such instructions, to whom they were given, the dates they were given, and the manner of giving such instructions.

ANSWERS:

INTERROGATORY NO. 24.

Did your company or your predecessor ever require your employees at the mines, mills, factories, or plants to wear respirators? If your answer is "yes," then state the first year that respirators were required.

ANSWER: 48 [illegible]

INTERROGATORY NO. 25.

Prior to your company or its predecessor, requiring your employees at mines, mills, factories, or plants to wear respirators, did you require of such employee a physical examination to determine whether the wearing of a respirator would endanger such employee's health?

ANSWER:

INTERROGATORY NO. 26.

Was your company aware that in 1971-1972, in Washington, D. C. an advisory committee on the asbestos standard was set up by the United States Secretary of Labor, James Hodgson, which committee recommended to the Secretary of Labor that before respirators could be issued to workers for any reason, each worker must have a complete physical examination to determine whether such worker could wear a respirator without endangering his health?

ANSWER:

N/A

INTERROGATORY NO. 27.

Did your company or your predecessor ever place any warning signs on the containers in which asbestos insulaiton products were packaged?

ANSWER:

INTERROGATORY NO. 28.

If you have answered Interrogatory No. 27 in the affirmative, please state:

(a) On what date did your company or your predecessor, issue an order directing a warning be placed on your insulation products or containers?

(b) On what date was such warning actually first placed on your insulation products or containers?

(c) State the exact size of the warning printed on your asbestos products or containers.

(d) Did your company or its predecessor, place such warning on your asbestos insulation products or containers?

(e) Please attach to your answers to these interrogatories true and correct copies of any photographs you may have showing the placement of such warning on the boxes containing your products.

ANSWER:

INTERROGATORY NO. 29.

Did your company or its predecessor, ever place any warning on any of its asbestos insulation pipe covering, blocks, cloth or millboard?

ANSWER:

INTERROGATORY NO. 30.

If your answer to Interrogatory No. 29 is "yes," then state the date and type of product on which said warning was stamped or printed.

ANSWER:

INTERROGATORY NO. 31.

Did you company ever stamp the name of its company, its initials or any identifying logo on any of its asbestos pipe covering, blocks, cloth or millboard?

ANSWER:

INTERROGATORY NO. 32.

Did the warning inquired about in Interrogatories No. 27 and 29, or a similar warning, ever appear in any of your sales literature? If so, attach copies or such sales literature, showing the date such literature was printed.

ANSWER:

INTERROGATORY NO. 33.

On what date was the sales literature inquired about in Interrogatory No. 32 first provided to distributors or sellers of your company's products, or your predecessor's products?

ANSWER:

INTERROGATORY NO. 34.

Has your company or its predecessor ever devised a high temperature heat insulation which does not contain asbestos? If so, state the date that such insulation was first placed on the market.

ANSWER:

INTERROGATORY NO. 35.

If your company or its predecessor ever devised a high temperature heat insulation which does not contain asbestos, state what prompted your company to devise such high tempera-ture heat insulation not containing asbestos.

ANSWER:

INTERROGATORY NO. 36.

Has such high temperature heat insulation not containing asbestos performed satisfactorily; that is, is such insula-tion suitable for the purpose for which it is to be used?

ANSWER:

INTERROGATORY NO. 37.

Give the trade name of your high temperature heat insulation products which do not contain asbestos, and state fully what such insulation contains.

ANSWER:

INTERROGATORY NO. 38.

Does your company have now, or has it ever had, a division or subsidiary company engaged in the contracting business of applying asbestos containing insulation products? If so, give the name of such division or subsidiary company, full address of the home office of such division or subsidiary company, and the date or dates such company or subsidiary was engaged in the contracting business.

ANSWER:

INTERROGATORY NO. 39.

Please state whether or not any division of your company or subsidiary company engaged in the contract business of applying insulation products, had any claims for lung diseases or death from lung disease attributable to asbestosis, mesothelioma or lung cancer. If the answer is "yes," give the names of such employees and attach copies of such claims.

ANSWER:

INTERROGATORY NO. 40.

Has your company or its predecessor ever conducted or caused to be conducted, any studies designed to minimize or eliminate the inhalation of asbestos dust and fibers by those exposed to the use of your company's insulation products? If so, give the following:

(a) Name of the person or firm conducting such studies.

(b) The date the studies began and the date completed.

(c) Any publication or dissemination of the results of the studies.

(d) The nature of any action to eliminate or minimize the inhalation of asbestos dust or fibers.

ANSWER:

INTERROGATORY NO. 41.

State the year that this defendant or any predecessor was first advised of either threshold limit value or maximum allowable concentrations of both asbestos dust and total dust by the American Conference of Governmental Industrial Hygienists, and state the name of the employee-official of the company receiving such advice and attach copies of the instrument communicating such advice.

ANSWER:

→ To Langley & Mansur in his pltr.

1963 Threshold limit Values for Airborne Contaminants

R.H. Mansur - Manager Environmental and Industrial Hygiene

Ed Lamont -

Dick Mansur.

INTERROGATORY NO. 42.

Was such threshold limit values or maximum allowable concentrations inquired about in Interrogatory No. 41 total dust and not just asbestos dust?

ANSWER:

Mineral Dust - Asbestos

INTERROGATORY NO. 43.

State whether or not the American Conference of Governmental Industrial Hygienists is or is not an agency or department of the United States Government.

ANSWER: No

INTERROGATORY NO. 44.

Has your company or its predecessor ever advised any contractor to whom you sell your products containing asbestos of threshold limit values for exposure to asbestos dust recommended by the American Conference of Governmental Industrial Hygienists? If so, state the date or dates that you so advised such contractors, the manner in which you advised such contractor, and the name of each contractor.

ANSWER: No

INTERROGATORY NO. 45.

Before releasing the products previously listed in these interrogatories to the public, were any tests conducted on them to determine potential health hazards involved in the use of materials contained in those products?

ANSWER:

INTERROGATORY NO. 46. If the answer to Interrogatory No. 45 is affirmative, state:

(a) The names of the products tested and date.

(b) The name, address and job title of each person who conducted those tests.

(c) The results of those tests and date.

ANSWER:

INTERROGATORY NO. 47.

Do any documents, including written memoranda, specifications, recommendations, blueprints, or other written materials of any kind or character relating to the testing of the named products now exist?

ANSWER:

INTERROGATORY NO. 48. If the answer to Interrogatory No. 47 is affirmative:

(a) List each document and date.

(b) State the name, address, and job title of each person who currently has possession of each document and where it is presently located.

ANSWER:

INTERROGATORY NO. 49.

Did the defendant or its predecessor, or any of its subsidiary companies make any design changes as a result of those tests?

ANSWER:

INTERROGATORY NO. 50. If the answer to Interrogatory No. 49 is affirmative, state:

(a) The trade names of the products changed.

(b) The nature of the changes made.

(c) The name, address, and job title of each person responsible for having made a change.

ANSWER:

INTERROGATORY NO. 51.

Please state the amount of asbestos fibers that are required to be in the body to produce the following diseases:

(a) Plural asbestosis.

(b) Parenchymal asbestosis.

(c) Lung cancer.

(d) Mesothelioma.

ANSWER:

INTERROGATORY NO. 52.

Please state in detail the evidence you intend to offer at the time of trial to show, or prove, that the plaintiff in this case was actually aware of the following dangers from exposure to asbestos.

(a) Plural asbestosis.

(b) Parenchymal asbestosis.

(c) Lung Cancer.

(d) Mesothelioma.

ANSWER:

INTERROGATORY NO. 53.

Has defendant, or its predecessor, or any of its subsidiary companies at any time been members of any "trade organization" or "association" comprised of other manufacturers, miners, marketers, and/or sellers of asbestos products?

ANSWER:

INTERROGATORY NO. 54. If the answer to Interrogatory No. 53 is affirmative, state:

(a) The name and address of each of those associations or organizations.

(b) The dates during which defendant or its predecessor or any of its subsidiary companies were members.

(c) The names of any publications published by or written by any of the named associations or organizations.

ANSWER:

INTERROGATORY NO. 55.

Have any written materials of any kind or character been prepared by defendant or its predecessor or any of its subsidiary companies or their agents indicating how asbestos products should be used and maintained? Please attach to your answers to these interrogatories true and correct copies of such literature.

ANSWER: YES

INTERROGATORY NO. 56.

Does defendant have insurance policies that might cover the claims made by plaintiff in this case?

ANSWER:

INTERROGATORY NO. 57.

If the answer to Interrogatory No. 56 is affirmative, list the name of each insurance carrier, the amount of coverage, and the effective dates of each policy.

ANSWER:

INTERROGATORY NO. 58.

Describe in detail the type of packages in which defendant or its predecessor, or any of its subsidiary companies, sold asbestos material, listing the dates each type of package was used, a physical description of each type of package, and a description of any printed material or trademarks that appeared on it. Please attach to your answers to these interrogatories true and correct copies of photographs of the packages in which your products were packed.

ANSWER:

INTERROGATORY NO. 59.

Does defendant admit that it or its predecessor or any of its subsidiaries sold asbestos insulation materials in the State of Texas at any time?

ANSWER:

INTERROGATORY NO. 60. If your answer to No. 59 is affirmative, list the dates during which the product was sold.

ANSWER:

INTERROGATORY NO. 61.

State the name of each and every witness, including experts, whom you intend to call to testify during the trial of this cause and indicate as to what they are expected to testify. If any of your expert witnesses whom you expect to testify at trial of this cause have furnished you with any sort of written reports, memoranda or any other written information, please identify such writings by attaching a true copy to yours answers hereto.

ANSWER:

INTERROGATORY NO. 62.

Name by date and source as to when your company, or its predecessor, first suspected there was a health hazard to human beings from exposure to, or breathing of, asbestos dust, fibers, or particles.

ANSWER:

Sept, 1963 asbestosis - + lung disease. lung cancer

Dec 24, 1966 Lung cancer —

INTERROGATORY NO. 63.

Please list and identify in detail each and every document, report, research study, survey, article or journal, both medical and technical, which this defendant will use, or anticipates using, at the time of trial.

ANSWER: