



PPG INDUSTRIES, INC./ONE GATEWAY CENTER/PITTSBURGH, PENNSYLVANIA 15222/AREA 412/434-3503

J. T. DESTEFANO, Manager
Environmental Control, Glass Division

July 3, 1973

To: All Environmental Control Engineers

Subject: Occupational Health Policy Manual

Enclosed are two copies of the newly published Occupational Health Policy Manual. One is for your use and the other is for the plant safety department. The plant nurse may also be interested in seeing and using this manual since it does include medical procedures, although these procedures should be covered in the PPG Medical Procedure Manual.

This binder is large, but at the present time contains only a small amount of material. This material will be added to as more OSHA regulations become law. It is the intent of this department to include the pertinent laws as they are approved with PPG's comments, procedures and recommendations attached.

As additions to this manual become available, they will be forwarded to you for insertion into the manual. It is hoped this manual will aid you in your occupational health problems, but for further clarification or added information, don't hesitate to call me.

Review this document when you receive it and examine it for completeness. It should include:

- 10.1 - PPG Noise Control Program
- 10.2 - PPG Respiratory Protection Policy
- 10.3 - PPG Asbestos Control Program
- 10.4 - PPG Carcinogen Control Program
- 10.5 - PPG Health Hazards Evaluation Requests under OSHA
- 30.1 - Respirators Approved by the Bureau of Mines
- 50.1 - Current OSHA Health Standards
- 50.11 - Occupational Noise and Air Contaminants

Any problems or questions call me at our new number GO + 864 + 262. This is our new telephone number at the RIDC. Our new Address is 1000 RIDC Plaza, P.O. Box 2811, Pittsburgh, Pennsylvania 15230.

A handwritten signature in dark ink, appearing to read 'Robert L. Rubino'.

Robert L. Rubino
Senior Environmental
Control Engineer
Glass Division

RLR/lrs

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June 1, 1973

TO: HOLDERS OF PPG OCCUPATIONAL HEALTH POLICY MANUAL

This Manual is for the use of anyone within the Company who has a responsibility for a portion of the Company Occupational Health Program. Such persons will include physicians, nurses, industrial hygienists, safety, and environmental control personnel at all locations of the Company. If only one Manual is issued to each major Company location, it should be filed and maintained in the facility's Medical Department.

As can be seen by the Index, the Manual is intended to contain Company, Division, and Facility's Occupational Health Policies and Procedures, information on occupational health surveys, personal protective equipment, hazardous materials, and training programs, etc., in short, anything that is pertinent to the Occupational Health Program of the facility.

This Manual is in loose-leaf form and is in a larger than presently required binder to permit changes and additions as may be required. In this regard each holder of the Manual should notify the Divisional Director of Environmental Control of his name, title, and location so changes or additions to the Manual originating from the General Office may be properly forwarded.

Lee B. Grant, M.D.

Lee B. Grant, M.D.
Medical Director

LBG:lc
Attachment

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PPG OCCUPATIONAL HEALTH POLICY MANUAL

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PPG OCCUPATIONAL HEALTH POLICY MANUAL

SECTION 10 - CORPORATE AND DIVISION OCCUPATIONAL
HEALTH POLICIES

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Date
Reviewed: 6/25/7

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CORPORATE POLICY

SUBJECT: ALCOHOL AND DRUG POLICIES

Authority:

J. C. Hentzen
President

June 25, 197

POLICY

EMPLOYEE ALCOHOL ABUSE

PPG Industries has a primary goal of conducting its business operations efficiently through effective and safe job performance on the part of all Company employees. If an employee's use of alcohol interferes with effective and safe job performance, this otherwise personal activity becomes a matter of Company concern.

If an employee is under the influence of alcohol while on Company premises severe disciplinary action up to and including discharge will be considered. Possession or use of alcohol while on Company premises will cause an employee to be subject to discharge.

Alcohol abuse is a behavioral/medical problem and chronic alcoholism is recognized generally as an illness. As such, our medical insurance programs provide coverage for the treatment of alcoholism when proper medical documentation exists. One distinguishing characteristic of chronic alcoholism from other diseases is that whether an individual drinks or does not drink is under the control of his or her will. The Company will encourage appropriate treatment when an employee has recognized a need and resolved to seek assistance.

A decision to terminate employment in cases of alcohol abuse may be postponed while other solutions are being actively sought and implemented; but a decision to terminate may be made if management has determined that:

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Date
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SUBJECT: ALCOHOL AND DRUG POLICIES

EMPLOYEE ALCOHOL ABUSE - Cont'd

1. Treatment has been unsuccessful despite adequate medical review; or
2. The employee refuses to obtain medical and/or other assistance in coping with a problem of alcohol abuse; and
3. The employee fails to return to satisfactory job performance.

Management has concomitant obligations to protect the safety and health of other employees and to safeguard Company property. These obligations may require an employee to be placed on unpaid leave or disciplinary layoff as an interim solution until treatment is effected.

POLICY

EMPLOYEE DRUG USAGE

Drug usage occurs within a framework of social and medical attitudes and legal restrictions. The position of PPG Industries regarding employee involvement with drugs is based on three fundamentals:

1. The Company is concerned with use of any drug or other substances which interfere with efficient and safe performance of the employee's job.
2. The Company cannot condone illegal activities on its property by its employees. The sale, purchase, use and possession of restricted drugs are illegal under federal and state laws.
3. The Company has the desire in the area of drug abuse to assist affected employees whenever possible in securing appropriate treatment so they can remain productively employed or return to productive employment.

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Date
Reviewed: 6/21

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SUBJECT: ALCOHOL AND DRUG POLICIES

EMPLOYEE DRUG USAGE - Cont'd

PPG Industries' actions in cases of employee drug involvement will depend on the facts of individual cases as they relate to the points stated above. An employee who engages in these proscribed activities on Company property will be subject to discharge. Also, should an employee be convicted on charges of illegal drug activity, his or her employment may be terminated.

If an employee is under the influence of drugs while on Company premises severe disciplinary action up to and including discharge will be considered. Possession or use of illegal drugs (including marijuana) while on Company premises will cause an employee to be subject to discharge.

The impact of drug usage on health and behavior may cause poor or unsafe job performance. Since health and work effectiveness are interrelated, the Company will encourage appropriate treatment when an employee has recognized such a need and has resolved to seek assistance. A decision to terminate employment in case of drug usage may be postponed while other solutions are being actively sought and implemented; but such a decision may be made if management has determined that:

1. Treatment has been unsuccessful despite adequate medical review; or
2. The employee refuses to obtain medical and/or other assistance in coping with a drug problem; and
3. The employee fails to return to satisfactory job performance.

Management has concomitant obligations to protect the safety and health of other employees and to safeguard Company property. These obligations may require an employee to be placed on unpaid leave or disciplinary layoff as an interim solution until treatment is effected.

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PPG INDUSTRIES, Inc.
NOISE CONTROL PROGRAM

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PPG INDUSTRIES - NOISE CONTROL PROGRAM

I. INTRODUCTION

Noise is unwanted sound which can cause hearing loss, speech interference and community annoyance. The purpose of this program is to protect our employees and community neighbors from these adverse effects of noise by minimizing them using engineering and medical means. The most effective and the least costly time to control noise is during the planning for new construction and the purchase of new equipment. However, noise present in our existing facilities must be identified and controlled when necessary.

II. POLICY

Appropriate measures will be taken to prevent the introduction of, and where already present, effect the elimination or control of noise exceeding the noise threshold limit values for hearing loss, the speech communications criteria in occupied spaces and community annoyance criteria at the boundaries of our plant properties. The above criteria are set forth in Attachments 1-3.

III. RESPONSIBILITIES

The Vice President of Manufacturing of the Division has the responsibility for implementing the Noise Control Program. There are certain plant and special staff responsibilities required to implement the program and these are outlined in Attachment 4.

IV. PROCEDURES

- A. Noise Information Inquiry. An information inquiry will be included in all purchase specifications for new machinery or equipment that could conceivably contribute to a noise problem within the Division (See Attachment 5).
- B. Noise Analysis. A noise survey of each area in the plant in which sound levels exceed 90 dBA shall be made at least once each year to ensure that sound levels have not increased above those originally existing. The survey may also establish that noise levels in some areas have been reduced to levels below 90 dBA and thereby justify discontinuing application of requirements for administrative controls, ear protection, and audiometric tests of individuals in such areas.

A noise survey of an area is recommended whenever a change is made in either equipment or type of operations so that significant changes in noise level will be acted upon immediately.

Tests of noise levels will be made with a sound level meter on the A-scale, slow response. The use of octave band analyzers or impact meters for control or other purposes shall be in addition to, not in place of, tests made with the sound level meter.

The sound level meter used will be one meeting specifications in ANSI Standard S1.4-1961, "General Purpose Sound Level Meters."

Records will be made of such surveys showing: the instrument used; date, time and location of such tests; machinery or equipment generating the noise; and name of person making the test.

Test records shall be kept readily available for inspection for 1 year or until a subsequent survey is made, if done more frequently.

The noise survey will be made by a consultant, a representative of a State Health or Labor Department, or by a qualified individual designated by the company. The data obtained will be recorded on the "Results of Noise Analysis", PPG Form 7913. (See Attachment 6) The mixed exposures will be recorded and the $\Sigma T_e/T_p$ value calculated using PPG Form 7914 provided for that purpose. These forms will then be attached to the "Results of Noise Analysis" form.

- C. Identify Persons Exposed To Hazardous Noise Levels. The plant Environmental Control Engineer will identify all persons exposed to hazardous noise levels (See Attachment 1) in each area surveyed, making sure to include persons of all shifts. He will complete Columns A-E on the back of "Results of Noise Analysis", PPG Form 7913. He will send a copy of this completed form to the Plant Safety Director and the Plant Medical Department. The plant will provide administrative support to maintain current noise exposure records on all persons exposed to hazardous noise.

D. Methods of Control.

1. Engineering and Administrative

- (a) The Division Director of Environmental Control will recommend measures to prevent the introduction of noise exceeding the noise criteria set forth in Paragraph II above during planning for new construction or purchase of new equipment.
- (b) The Plant Environmental Control Engineer will take and/or recommend appropriate engineering and administrative methods (See Attachment 7) to control noise exposure in the plant which exceeds Company, Division, Local, State or Federal Standards as applicable. However, until the noise can be controlled to meet the noise threshold limit values, the area of such noise will be designated as noise hazardous and clearly marked. Employees working in such areas will wear ear protection and have an annual audiogram taken.
- (c) All plans for new construction or purchase orders for new equipment will be reviewed by the appropriate Environmental Control Engineer and will contain an approval block which he will initial when he has provided his review and given his approval.

PPG INDUSTRIES
NOISE CONTROL PROGRAM
PAGE 3

2. Medical. All employees who are continuously exposed to hazardous noise, as defined in Attachment 1, will be required to wear appropriate ear protection and have annual audiometric examinations.

- (a) Ear Protection. The use of personal protective equipment is considered by the Department of Labor to be an interim measure while engineering and administrative controls are being perfected. There will be very few cases in which the use of this equipment will be acceptable as a permanent solution to noise problems.

Some methods of control, such as providing an isolation booth for operators, or conducting noisy operations when few employees are in the plant, may require use of personal protective equipment by the operator when he must emerge from his booth to make adjustments, or by those few employees who carry on the noisy operation.

In addition, the regulations require both provision and use of personal protective equipment. How the latter is accomplished is up to the employer. The Department of Labor recommends, however, that an educational and promotional program precede initiation of required use of such equipment, and continue as long as necessary to achieve 100-percent acceptance by employees. In the absence of an observable high proportion of use, the Department of Labor would consider the lack of a training and promotional program as constituting a violation of the regulation.

Cotton stuffed in the ears has little value and will not be accepted by the Department of Labor because of the relatively small attenuation (reduction of noise level) and the care which must be taken in using it. Ear inserts will be used. The MSA Ear Defenders and the Billesholm-Anti-Noise Ear Protectors are recommended. Ear muffs will not normally be used. The Divisional Director of Environmental Control may recommend their use under certain circumstances. The Nurse will fit and/or instruct the employee in the use of ear protection.

- (b) Audiometric Examinations. Audiometric tests will be made of all individuals working regularly or infrequently in areas in which the noise level is above 90 dBA. The purpose of these tests is to assure that administrative controls in use or ear protection devices provided are being adhered to or properly used and are effective in preventing loss of hearing from the noise levels encountered. Audiometric examinations will be performed by a person trained in hearing test procedures under proper test conditions and using appropriate test equipment so as to meet the USASI Standards S3.1-1960, "Criteria for Background Noise in Audiometer Rooms", and S3.6-1969, "Specifications for Audiometers." International Standards Organization (ISO)

calibration will not be used. The examinations will be recorded and evaluated on the "Audiometric Examination Form", PPG Form 7915, in accordance with the instructions thereon (See Attachment 8). The following film, available from the Medical Director's Office, will be shown annually to persons performing the audiometric examinations: "An Approved Technique For Pure Tone Air Conduction Audiometry."

The audiometer shall have a certificate of calibration before it is placed in use, and shall be recalibrated each year thereafter. This calibration shall check both frequency and intensity at each setting, rise time and overshoot, and electrical and mechanical integrity. A current certificate attesting to such calibration shall be readily available for inspection by the Department of Labor.

On the audiometer shall be a statement indicating it is calibrated to ASA 1951 values.

The audiometer shall be subject to a biological check, preferably once a week but at least once a month, or before each use of the instrument if it is used less than once a month. The check shall be made by testing a person with a known and stable audiometric curve. The monthly check should include movement and bending of cord, wire, and lead, knob turning, switch actuating, and button pushing to ensure that there are no sounds other than the test tones. A log of these checks shall be maintained and be available for inspection.

"Biological Calibration" consists of making repeat audiograms on persons under 25 with no hearing loss evidenced on previous audiograms. The threshold level for each test frequency should agree within Plus or Minus 5dB for each successive month test. If it doesn't, test at least two other persons with no hearing loss evidenced on previous audiograms. If these show greater than 5dB deviation in the same test frequencies, the audiometer should be recalibrated by the manufacturer of the audiometric equipment.

- (c) Medically Disqualified For Exposure To Hazardous Noise. Employees exceeding the hearing loss set forth in the Medical Standards Section of the "PPG Medical Procedures Manual" should be medically disqualified from working in a noise hazardous area.
- (d) "Results of Noise Analysis", PPG Form 7913. For those persons identified by the Noise Abatement Engineer on this form, the Medical Department will complete Columns F and G on the Medical Department copy of the form and advise the Noise Abatement Engineer, the Safety Director and Manager of Environmental Control of this information so they can record the information on their copies.

PPG INDUSTRIES
NOISE CONTROL PROGRAM
PAGE 5

- (e) Reindoctrination of Employees. Employees showing an increased hearing loss of greater than fifteen decibels at 4000 cps. when comparing the current audiogram with the last audiogram or one taken within the previous five years are identified as having a threshold shift. They must be refitted with ear protection and advised that they are not adequately protecting their hearing and be reindoctrinated into the need for and proper use of their hearing protection.
- (f) Employee Indoctrination. No employee shall be permitted to work in a noise hazardous area without being thoroughly indoctrinated by the medical and safety personnel as to the nature of the hazard, what the Company is doing and what he must do to protect his hearing. The following film, available from the Medical Director's Office, will be shown annually to all persons required to work in a noise hazardous area: "Ear Protection In Noise."

E. Training and Conferences. Those responsible for the various aspects of the Noise Control Program will be trained sufficiently to carry out their responsibilities. Conferences will be held periodically to exchange information and to permit program evaluation. Recommendations for such training and conferences will be made by the Director of Environmental Control and the Company Medical Director.

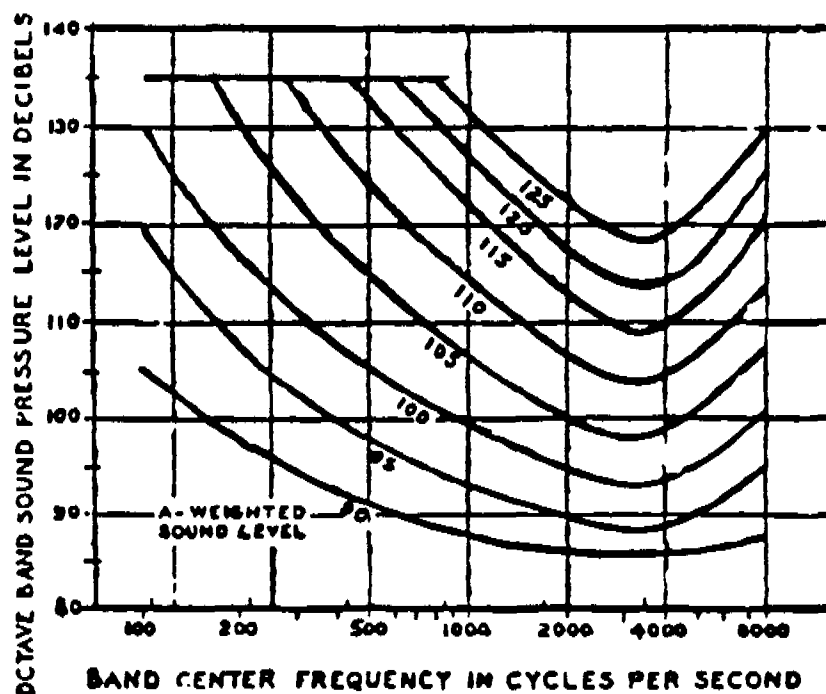
V. REFERENCES

Persons responsible for any aspect of the Noise Control Program should have available the following book: "Industrial Noise Manual . . . Second Edition" which is published by the American Industrial Hygiene Association, and also U.S. Department of Labor Bulletin 334, "Guidelines to the Department of Labor's Occupational Noise Standards for Federal Supply Contracts."

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THRESHOLD LIMIT VALUES FOR NOISE
(Taken From The Safety And Health Standards Of
The Federal Occupational Safety And Health Act
Dated May 29, 1971)

Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in the Permissible Noise Exposure Graph of this attachment when measured on the A scale of a standard sound level meter at slow response. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level may be determined as follows:



Equivalent sound level contours. Octave band sound pressure levels may be converted to the equivalent A-weighted sound level by plotting them on this graph and noting the A-weighted sound level corresponding to the point of highest penetration into the sound level contours. This equivalent A-weighted sound level, which may differ from the actual A-weighted sound level of the noise, is used to determine exposure limits from the Permissible Noise Exposure Graph.

When employees are subjected to sound exceeding those listed in the Permissible Noise Exposure Graph of this attachment, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce

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sound levels within the levels of the graph, personal protective equipment shall be provided and used to reduce sound levels within the levels of the graph.

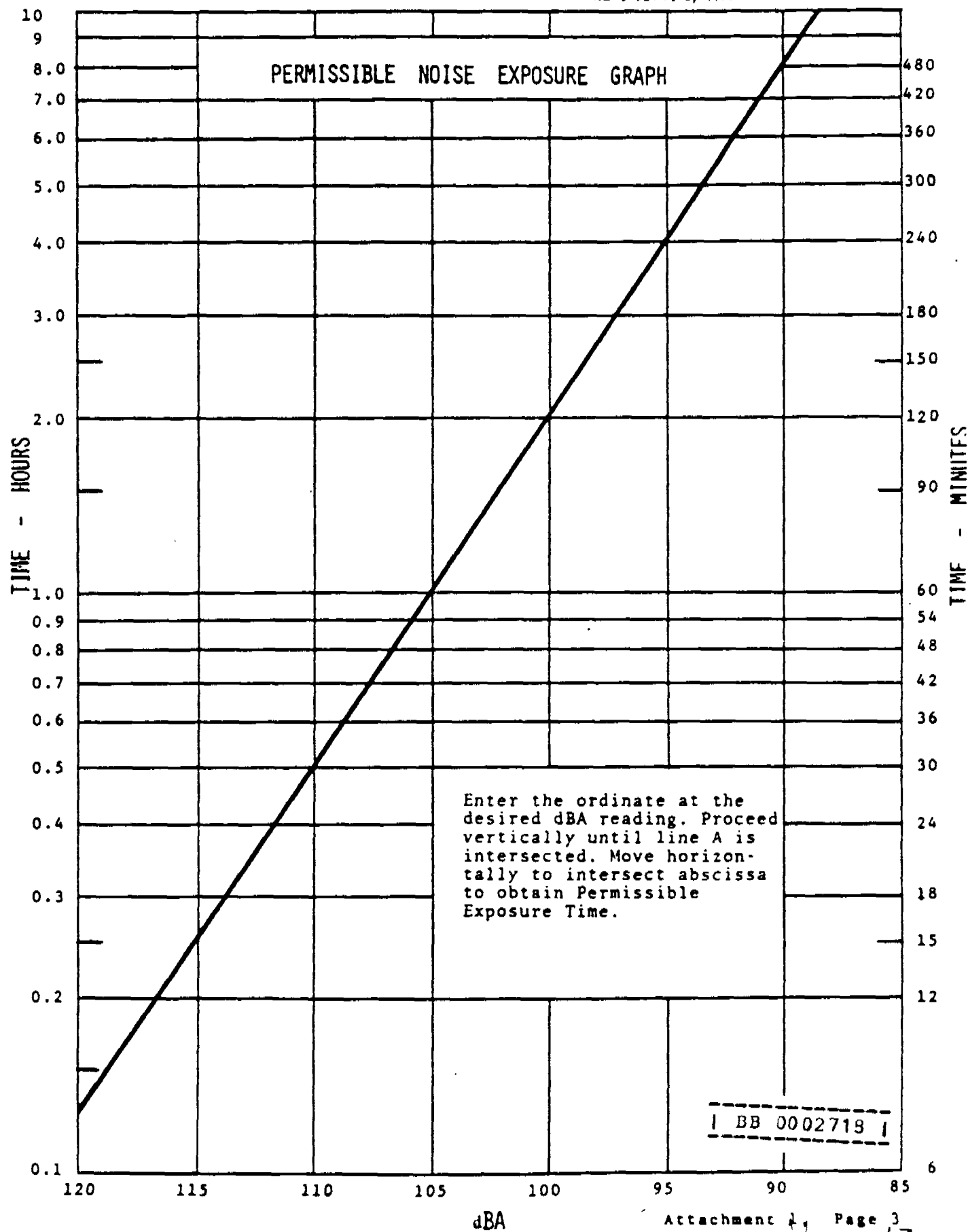
If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered intermittent. In such cases, where the duration of the maxima are less than 1 second, they shall be treated as of 1-second duration.

When the daily exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the summation of all fractions T_e/T_p , ($\Sigma T_e/T_p$), exceeds unity, then, the mixed exposure should be considered to exceed the limit value. T_e indicates the total time of exposure at a specified noise level, and T_p indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dBA peak sound pressure level.

In all cases where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program shall be administered.

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A-WEIGHTED SOUND PRESSURE LEVEL IN DECIBELS

As read from a sound level or survey meter

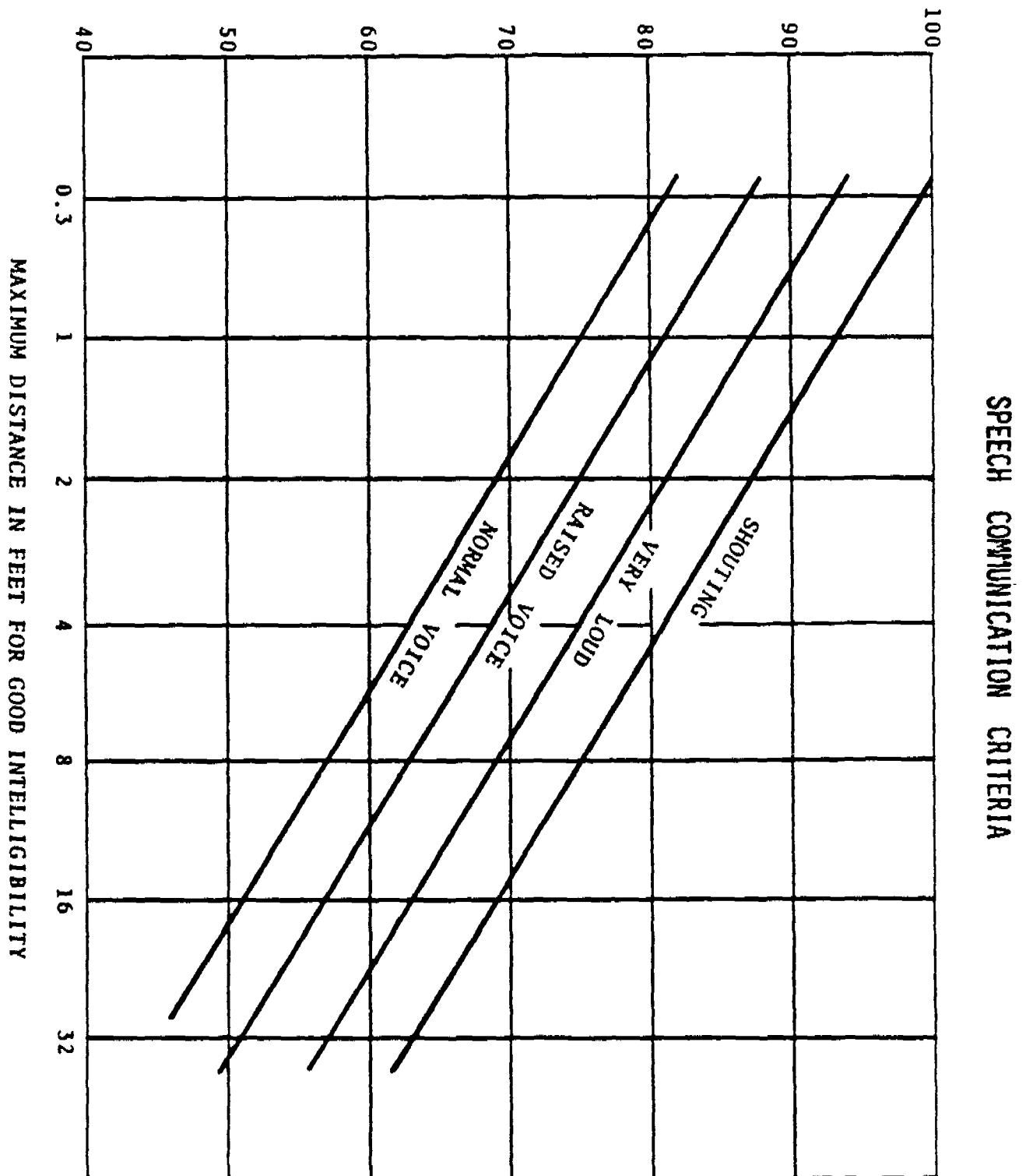


Fig. 3

MAXIMUM DISTANCE IN FEET FOR GOOD INTELLIGIBILITY

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RECOMMENDED NOISE CRITERIA FOR OFFICES

Noise measurements made for the purpose of judging the satisfactoriness of the noise in an office by comparison with these criteria should be performed with the office in normal operation, but with no one talking at the particular desk or conference table where speech communication is desired (i.e., where the measurement is being made). Background noise with the office unoccupied should be lower, say by 5 to 10 db.

dba	Communication Environment	Typical Applications
31 - 41	Very quiet office-telephone use satisfactory-suitable for large conferences.	Executive offices and conference rooms for 50 people.
41 - 45	"Quiet" office; satisfactory for conferences at a 15-ft. table; normal voice 10 to 30 ft; telephone use satisfactory.	Private or semi-private offices, reception rooms, & small conference rooms for 20 people.
45 - 50	Satisfactory for conferences at a 6- to 8-ft table; telephone use satisfactory; normal voice 6 to 12 ft.	Medium-sized offices and industrial business offices.
50 - 59	Satisfactory for conferences at a 4- to 5-ft table; telephone use occasionally slightly difficult; normal voice 3 to 6 ft; raised voice 6 to 12 ft.	Large engineering and drafting rooms, etc.
59 - 62	Unsatisfactory for conferences of more than two or three people; telephone use slightly difficult; normal voice 1 to 2 ft; raised voice 3 to 6 ft.	Secretarial areas (typing), accounting areas (business machines), blueprint rooms, etc.
Above 62	"Very noisy"; office environment unsatisfactory; telephone use difficult.	Not recommended for any type of office.

COMMUNITY ANNOYANCE CRITERIA

Determine the level for each of the eight octave bands. The N for annoyance of the noise is the highest of these numbers. Apply corrections where necessary as shown in Table A, to determine the "corrected noise rating number." The public reaction to the noise can be estimated by referring to Table B.

Where detailed measurements are not available for one reason or another, approximations may be made by using the "A" scale on a standard sound level meter. The meter reading minus 8 dB may be taken as a rough indication of N.

In some cases the above procedure may prove unsatisfactory and it may be necessary to measure the background noise in the absence of the allegedly annoying noise. When the background noise is exceeded by the complained-of noise, after appropriate correction, by 10 dB or more in any octave band the noise may be considered annoying.

For example: A residential area with widely separated homes would be rated as low as N 30. On the other hand a heavily industrialized area would be rated as high as N 55 without complaints. Higher levels are more acceptable in industrial areas than in residential areas, probably because of higher background noise.

Hence the rating method must be composite and include allowances for various influencing factors such as noise level, spectrum, time distribution of the noise, background noise, season of the year, time of day or night, and previous noise experience. Obviously the suggested corrections are only approximations that are more or less arbitrary, but they should serve as a frame work upon which to gather experience and information.

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TABLE A
CORRECTION TO NOISE RATING NUMBER
 (Primarily Applicable to Residential Cases)

Influencing Factor	Possible Conditions	Corrections to Uncorrected N
Noise Spectrum Character	Pure tone components	+5
	Wide band noise	0
Peak Factor	Impulsive	+5
	Nonimpulsive	0
Repetitive Character (About $\frac{1}{2}$ minute noise duration assumed)	Continuous exposure to one-per-minute	0
	10-60 exposures per hour	-5
	1-10 exposures per hour	-10
	4-20 exposures per day	-15
	1-4 exposures per day	-20
	1 exposure per day	-25
Adjustment to Exposure	No previous conditioning	0
	Considerable previous conditioning	-5
	Extreme conditioning	-10
Time of Day and Season	Only during daytime	-5
	At night	+5
	Winter	-5
	Summer	0
Allowance for local Conditions	NEIGHBORHOOD	
	Rural	+5
	Suburban	0
	Residential (urban)	-5
	Urban near light industry	-10
	Industrial area (heavy industry)	-15

TABLE B
PUBLIC REACTION TO NOISE IN RESIDENTIAL DISTRICTS

Corrected Noise Rating Number	Estimated Public Reaction
Below 40	No observed reaction
40-50	Sporadic complaints
45-55	Widespread complaints
50-60	Threats of community action
Above 65	Vigorous community action

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NOISE CONTROL PROGRAM
- Responsibilities

I. PLANT MANAGER

Implement program in accordance with Company and Division Policy and Standards.

II. PLANT ENVIRONMENTAL CONTROL ENGINEER

1. Perform and evaluate the results of noise studies.
2. Recommends application of appropriate noise control measures.
3. Designates noise hazardous areas and identifies persons requiring ear protection and audiometric examinations.
4. Assists in the selection and proper placement of the audiometric testing booth.

III. PLANT MEDICAL DEPARTMENT

1. Perform and evaluate audiometric examinations of applicants and employees and make appropriate recommendations to conserve hearing.
2. Select and fit ear protection.
3. Instruct employees in the need for and proper use of ear protection and audiometric examinations.
4. Selects the audiometer.

IV. PLANT SAFETY DIRECTOR

1. Requests the Environmental Control Engineer to investigate suspected noise problems which he may encounter.
2. Assists in identifying persons requiring ear protection and audiometric examination.
3. Assists in instruction of employees in the need for and proper use of ear protection and audiometric examinations.
4. Assists in the selection of and supervision of the wearing of ear protection.

V. DIVISION DIRECTOR OF ENVIRONMENTAL CONTROL

Responsible to the Vice President or Director of Manufacturing to direct all Division activities pertaining to noise control consistent with the protection of hearing, legislative requirements at all levels of government and policy standards set by the Company and Division.

VI. DIVISIONAL NOISE ABATEMENT ENGINEER

The Divisional Environmental Control Director is responsible to prevent the introduction of noise during planning for new construction or purchase of new equipment.

VII. COMPANY MEDICAL DIRECTOR

Consult with General Office and Plant personnel responsible for the Noise Control Program.

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NOISE INFORMATION INQUIRY

If the equipment under consideration generates noise of a magnitude in excess of 85 dB re 0.0002 microbars in any one test frequency (octave band) when measured with appropriate instruments one, three and seven meters from the source of the noise or have an overall noise level of 90 dBA measured one, three and seven meters from the noise source, PPG shall be notified and furnished the noise levels and details by which the measurements were made.

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RESULTS OF NOISE ANALYSIS

PLANT Works 22 - Huntsville
DATE 7/15/69

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LOCATION AND OPERATION	NUMBER PERSONS EXPOSED DURING SHIFT	CHARACTER OF NOISE IMPULSE OR STEADY	CHARACTER OF EXPOSURE CONTINUOUS OR INTERMITTENT	d SCALE	ALL PASS	FREQUENCY RANGE IN Hz - LEVEL IN dB (Re 0.0002 microns)										REMARKS	Attachment 6, Page 1
						16 - 25	25 - 50	50 - 100	100 - 200	200 - 400	400 - 800	800 - 1600	1600 - 3200	3200 - 6400	6400 - 12800		
Temp. Dept. Desk Area - 1 Fan	3	40	St.	Cont.	84	92	88	85	82	81	79	76	73	67			
De Coating Booth 1 Fan Operating	1	24	St.	Inter	97	111	100	101	111	89	88	83	76	70			
Finishing Dept. Buffing Tables	2	6	St.	Inter.	82	90	85	84	82	76	78	72	71	72			
Welding Booth Exhaust Fan On	1	7	St.	Inter.	88	96	86	94	89	83	77	75	71	65		Note Fan Noise in 75-150 cps	
Temp. Dept. - 2 Fans At Loading Station	3	40	St.	Cont.	87	95											
Temp. Dept. - 2 Fans At Cleaning Station	3	40	St.	Cont.	87	93											
Box Shop Crating	2	48	Imp.	Cont.	79											Not definable with present eqipt. Hearing Protection Recommended.	

*LIST ALL PERSONS EXPOSED TO CONTINUOUS OR
EQUIVALENT 90A 90 OR GREATER ON BACK OF THIS
FORM AND PROVIDE REQUESTED INFORMATION.
Form 7813

Surveyed By J.T. Destefano
J.C. Harper

Equipment Used G.R. 1565A
G.R. 1558A

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Attachment 6, Page 2
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EVALUATION OF MIXED EXPOSURE

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OCCUPATION	ACTIVITY	dBA	ACTUAL EXPOSURE TIME (T _a)	PERMISSIBLE EXPOSURE TIME (T _p)	T _a /T _p	Σ T _a /T _p
De Coat Operator	De Coating	97	150	210	0.71	I BB 0002727 I
	Background	66	85	∞	0	
	Belt Sander with Glass	85	75	∞	0	
	Belt Sander without Glass	75	75	∞	0	
	Buss Bar Room	72	45	∞	0	
	Cafeteria	75	50	∞	0	
			480			
						0.71

FORM 7914

METHODS OF INDUSTRIAL NOISE CONTROL

I. ENGINEERING

Engineering controls are those which reduce the sound intensity either at the source of the noise or in the hearing zone of the workers.

The following are examples:

A. Maintenance

1. Replacement or adjustment of worn and loose or unbalanced parts of machines.
2. Lubrication of machine parts and use of cutting tools.
3. Properly shaped and sharpened cutting tools.

B. Substitution of Machines

1. Larger, slower machines for smaller, faster ones.
2. Step dies for single operation dies.
3. Presses for hammers.
4. Rotating shears for square shears.
5. Hydraulic for mechanical presses.
6. Belt drives for gears.

C. Substitution of Processes

1. Compression for impact riveting.
2. Welding for riveting.
3. Hot for cold working.
4. Pressing for rolling or forging.

D. Vibration Dampening

1. Increase mass.
2. Increase stiffness.
3. Use rubber or plastic bumpers or cushions.
4. Change size to change resonance frequency.

E. Reducing Sound Transmission Through Solids

1. Flexible mountings.
2. Flexible sections in pipe runs.
3. Flexible shaft couplings.
4. Fabric sections in ducts.
5. Resilient flooring.

F. Reducing Sound Produced by Fluid Flow

1. Intake and exhaust mufflers.
2. Fan blades designed to reduce turbulence.
3. Large, low speed fans for smaller, high speed fans.

G. Include Noise Level Specifications When Ordering New Equipment.

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H. Isolating Noise Sources

1. Completely enclose individual machines.
2. Use baffles.
3. Confine high noise machines to insulated room.

I. Isolating Operator

Provide a relatively sound-proof booth for the operator or attendant of one or more machines.

Controlling noise at the source, as illustrated by A through H1, is the ideal means of preventing noise induced hearing loss. The results are relatively long lasting; the operator of the individual machine is protected, as well as those employees at a distance from it, and there is no need for wearing protective equipment or following prescribed schedules of exposure. The measures listed under H2, H3, and I will, if effective, limit the number of persons exposed to high noise levels, but are unlikely to protect operators and those close to the noise sources.

A number of the listed controls can be accomplished quite inexpensively by plant personnel. Others require considerable expense and highly specialized technical knowledge to ensure the expected results. It is, therefore, strongly recommended that plants avail themselves of the services of competent acoustical engineers in planning and carrying out their noise control programs. The Department of Labor expects employers to explore the possibility and practicability of controlling noise by engineering and to take all feasible measures before resorting to use of administrative controls or of personal protective equipment.

II. ADMINISTRATIVE

If noise cannot be reduced to permissible intensities through engineering controls, administrative controls should be developed in order to limit duration of workers' exposure to noise levels above 90 dBA to the limits shown in Attachment 1.

The following are examples:

1. Arrange work schedules so that employees working the major portion of a day at or very close to the 90 dBA limit are not exposed to higher noise levels.
2. Ensure that employees who have reached the upper limit of duration for a high noise level, in accordance with Attachment 1, work the remainder of the day in an environment with a noise level well below 90 dBA.
3. Where the man-hours required for a job exceed the permissible time for one man in one day for the existing sound level, divide the work among two, three, or as many men as are needed, either successively or together, to keep individual noise exposure within permissible time limits.

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4. If less than full-time production of a noisy machine is needed, arrange to run it a portion of each day, rather than all day for part of the week.
5. Perform occasional high level noise producing operations at night or at other times when a minimum number of employees will be exposed.

Measures such as these can often be instituted at little cost or effort, simply by introducing noise exposure as a factor in production planning. While not as satisfactory as controlling noise at its sources, administrative control measures are more easily enforced, than is the requirement to wear personal protective equipment. For this reason it is preferred.

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AUDIOMETRIC EXAMINATION

PPG OCCUPATIONAL HEALTH POLICY MANUAL
SECTION 10.1
REV. SEPT. 3, 1971

IMPORTANT: This examination should not be done sooner than fifteen hours after the last exposure to an in-plant area designated as noise hazardous or a significant off-the-job noise exposure. Only audiometers calibrated to meet ASA (USASI) Standards will be used.

1. NAME JOHN E. DOE BADGE NUMBER 1320 AGE 55

2. PURPOSE OF EXAMINATION
☐ PRE-EMPLOYMENT ☒ ANNUAL PERIODIC ☐ OTHER

3. DATE OF PRESENT AUDIOMETRIC EXAMINATION 7/23/69 DATE OF LAST AUDIOMETRIC EXAMINATION 7/25/68

4. NOISE EXPOSURE INFORMATION
A. IS EMPLOYEE PRESENTLY WORKING IN A NOISE HAZARDOUS AREA? ☒ YES ☐ NO

B. ANSWER THE FOLLOWING ONLY IF THE ANSWER TO 4A IS YES:

(1) THE NUMBER OF HOURS SINCE LAST EXPOSURE TO HAZARDOUS NOISE 16

(2) dBA EXPOSURE 96

(3) MONTHS' OR YEARS' EXPOSURE WITH AND WITHOUT EAR PROTECTION TO ABOUT THE SAME NOISE LEVEL (SHOW DATES):

WITH EAR PROTECTION JAN 64 TO PRESENT WITHOUT EAR PROTECTION FEB 44 TO JAN 64

(4) TRADE NAME OF EAR PROTECTOR USED MSA EAR DEFENDER

5. RECORD RESULTS OF PRESENT HEARING TEST

	FREQUENCIES (cps)					
	500	1000	2000	3000	4000	6000
RIGHT EAR	10	15	20	25	40	30
LEFT EAR	15	20	30	40	55	40

6. DETERMINATION OF MEDICAL QUALIFICATION FOR EMPLOYMENT TO WORK IN A NOISE HAZARDOUS AREA.
FROM 5 ABOVE, DETERMINE THE ARITHMETIC AVERAGE OF THE VALUES FOR EACH EAR FOR THE FOLLOWING THREE FREQUENCIES 500, 1000 AND 2000 CPS. AND RECORD BELOW:

ARITHMETIC AVERAGE OF 500, 1000 AND 2000 CPS.

RIGHT EAR	15
LEFT EAR	22

A. FOR AN APPLICANT FOR EMPLOYMENT.

TO DETERMINE THE CLASSIFICATION IN REGARD TO EMPLOYMENT, REFER TO PARAGRAPH C, EARS, OF SECTION II "STANDARDS FOR MEDICAL CLASSIFICATION OF APPLICANTS FOR EMPLOYMENT."

CHECK ONE: ☐ A ☐ B ☐ C ☐ D

B. FOR EMPLOYEE TO CONTINUE TO WORK IN A NOISE HAZARDOUS AREA.

IF THE LOSS OF HEARING IN THE BETTER EAR AS RECORDED ABOVE FOR ARITHMETIC AVERAGE OF THE 500, 1000 AND 2000 FREQUENCIES IS GREATER THAN 15 DECIBELS, THE EMPLOYEE IS NOT MEDICALLY QUALIFIED TO WORK IN A NOISE HAZARDOUS AREA.

CHECK ONE: ☒ QUALIFIED ☐ NOT QUALIFIED

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7. DETERMINATION OF ADEQUACY OF PROTECTION AGAINST HAZARDOUS NOISE

FROM 5 ABOVE. RECORD THE VALUES FOR THE 4000 CPS. FREQUENCY FOR EACH EAR BELOW UNDER PRESENT TEST. ALSO, IF A PREVIOUS AUDIOGRAM HAS BEEN DONE, RECORD THE SAME VALUES FROM IT BELOW UNDER PREVIOUS TEST AND SHOW THE DATE OF THE PREVIOUS AUDIOGRAM.

IF THE PRESENT TEST SHOWS A GREATER LOSS IN EITHER EAR THAN THE PREVIOUS TEST, SHOW THIS DIFFERENCE UNDER THRESHOLD SHIFT.

	3000 4000 CPS VALUE ~~* SEE BELOW~~		THRESHOLD SHIFT
	PRESENT TEST	PREVIOUS TEST ² (SHOW DATE)	
RIGHT EAR	25	20 (6/15/68)	5
LEFT EAR	40	30	10

IF THE HEARING LOSS AT 4000 CPS. IN EITHER EAR IS LESS THAN 40 DECIBELS AND THERE IS A RECORD OF A PREVIOUS AUDIOGRAM, COMPARE THE PRESENT HEARING LOSS WITH THAT PREVIOUSLY RECORDED AT 4000 CPS. IN EACH EAR. ANY INCREASE IN LOSS FROM THE PREVIOUS AUDIOGRAM REPRESENTS A THRESHOLD SHIFT. IF THIS THRESHOLD SHIFT IS 15 DECIBELS OR GREATER IN EITHER EAR, IT SUGGESTS THAT THE HEARING PROTECTION IS NOT ADEQUATE. THIS EMPLOYEE

- MUST BE ADVISED OF THIS SHIFT AND THE NEED FOR MORE ADEQUATE PROTECTION;
- REFITTED AND REINSTRUCTED IN THE PROPER USE OF HIS EAR PROTECTION;
- RETESTED FOR EVIDENCE OF FURTHER LOSS IN SIX MONTHS.

NAME OF PERSON PERFORMING AUDIOMETRIC EXAMINATION

JANE R. SMITH, R.N.

* BECAUSE BEST EAR SHOWED 40 DB LOSS
AT 4000 C.P.S., 3000 CPS WAS USED

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PPG RESPIRATORY PROTECTION POLICY

- I. REFERENCES: Occupational Safety and Health Act - 1910.134 "Respiratory Protection" (See attachment 1)

American National Standards Institute Z88.2 "Practices for Respiratory Protection"

American Industrial Hygiene Association Respirator Manual

- II. PURPOSE: To provide a basic guide for proper selection and utilization of respiratory protective equipment in accordance with the references listed above.

- III. POLICY: Every effort will be made to reduce the levels of airborne contaminant to acceptable levels in all plant areas through appropriate engineering controls. In cases involving accidental release of contaminant or extenuating operating conditions which cause the level of airborne contaminant to temporarily exceed the Threshold Limit Value (TLV), respiratory protection will be required.

It is of paramount importance that all respiratory protective equipment be carefully selected and maintained. All users of respiratory protection must be thoroughly trained in the applications and limitations of each device required.

IV. RESPONSIBILITIES:

A. Medical Department

1. Corporate

- a. Provide guidance concerning the medical evaluation required to determine if employees who are to be assigned to tasks requiring the use of respirators are physically able to perform the work and use the respirator without hazard to themselves or their fellow employees.
- b. Provide guidance concerning the medical evaluation required to determine the effectiveness of the respiratory protection in protecting the employee from excessive exposure to airborne contaminants.
- c. Assist in assessing the effectiveness of the respiratory protection program by periodic review of plant environmental and biological monitoring data.

2. Plant

- a. Perform medical evaluations on employees required to wear respirators (see Paragraph 1a. & b. above), providing or arranging for such medical x-ray and/or laboratory support as may be required. The results of the medical evaluations will be maintained in the individual employee's plant medical record.
- b. Provide to the Corporate Medical Department periodic summaries of the data obtained from the medical evaluation as may be required, with copies to the Divisional Industrial Hygienist.

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- c. Maintain sufficient familiarity with the respiratory protection being used in the plant to assist in evaluating whether the employee is physically able to perform the work and use the respirator without hazard to himself or his fellow employees.

B. Environmental Control and Safety

1. Division

- a. Conduct in-plant environmental surveys in conjunction with plant personnel to determine need for respirators.
- b. Select respirator which will afford protection for airborne contaminants involved and advise plant medical of types and specification of equipment as necessary background information.
- c. Make periodic checks of respirators in use to determine suitability and quality of maintenance. This will include random performance evaluations of equipment in use.
- d. Review all S.O.P.'s requiring respirator use. Attachment II is an example of an S.O.P. covering general procedures for non-emergency respirators.
- e. Provide a training program for use in training of plant supervisory personnel.
- f. Consult with corporate and plant Medical Departments on results of environmental surveys and assist in identifying employees requiring medical monitoring.
- g. Correlate results from environmental surveys and medical monitoring and coordinate recommendations for further action, such as transfer from one job to another.

2. Plant

- a. Administer and supervise program including maintenance of records regarding medical certification of employee to wear respiratory protection.
- b. Determine those required to wear respiratory equipment in conjunction with Divisional Environmental Control personnel.
- c. Assign respirators and train individuals in proper use including reasons for use, proper fitting, limitations, and respirator maintenance.
- d. Insure proper use and maintenance by regular training and plant inspection.
- e. Periodically inspect all emergency respiratory protection and document the condition of equipment using PPG Form 9472 Gas Mask Check List shown in Attachment III and/or PPG Form 9473 Respiratory Equipment Check List shown in Attachment IV. The specific equipment being inspected will be adequately identified on the document.
- f. Consult with Divisional Environmental Control personnel on all questionable situations.
- g. Promulgate a suitable S.O.P. for all tasks involving the use of respirators. Divisional Environmental Control should be provided with a copy for comment.

OCCUPATIONAL SAFETY AND HEALTH STANDARDS SUBPART I - PERSONAL PROTECTIVE EQUIPMENT

(Code of Federal Regulations, Title 29, Chapter XVII, Part 1910, 37 FR 22231,
October 18, 1972, with subsequent amendments indicated where appropriate in the text.)

Subpart I—Personal Protective Equipment

§ 1910.132 General requirements.

(a) *Application.* Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

(b) *Employee-owned equipment.* Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.

(c) *Design.* All personal protective equipment shall be of safe design and construction for the work to be performed.

§ 1910.133 Eye and face protection.

(a) *General.* (1) Protective eye and face equipment shall be required where there is a reasonable probability of injury that can be prevented by such equipment. In such cases, employers shall make conveniently available a type of protector suitable for the work to be performed, and employees shall use such protectors. No unprotected person shall knowingly be subjected to a hazardous environmental condition. Suitable eye protectors shall be provided where machines or operations present the hazard of flying objects, glare, liquids, injurious radiation, or a combination of these hazards.

(2) Protectors shall meet the following minimum requirements:

(i) They shall provide adequate protection against the particular hazards for which they are designed.

(ii) They shall be reasonably comfortable when worn under the designated conditions.

(iii) They shall fit snugly and shall not unduly interfere with the movements of the wearer.

(iv) They shall be durable.

(v) They shall be capable of being disinfected.

(vi) They shall be easily cleanable.

(vii) Protectors should be kept clean and in good repair.

(3) Persons whose vision requires the use of corrective lenses in spectacles, and who are required by this standard to wear eye protection, shall wear goggles or spectacles of one of the following types:

(i) Spectacles whose protective lenses provide optical correction.

(ii) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(iii) Goggles that incorporate corrective lenses mounted behind the protective lenses.

(4) Every protector shall be distinctly marked to facilitate identification only of the manufacturer.

(5) When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see that such limitations and precautions are strictly observed.

(6) Design, construction, testing, and use of devices for eye and face protection shall be in accordance with American National Standard for Occupational and Educational Eye and Face Protection, Z87.1-1968.

§ 1910.134 Respiratory protection.

(a) *Permissible practice.* (1) In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to the following requirements.

(2) Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protective program which shall include the requirements outlined in paragraph (b) of this section.

(3) The employee shall use the provided respiratory protection in accordance with instructions and training received.

(b) *Requirements for a minimal acceptable program.* (1) Written standard operating procedures governing the selection and use of respirators shall be established.

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.

(3) The user shall be instructed and trained in the proper use of respirators and their limitations.

(4) Where practicable, the respirators should be assigned to individual workers for their exclusive use.

(5) Respirators shall be regularly cleaned and disinfected. Those issued for

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the exclusive use of one worker should be cleaned after each day's use, or more often if necessary. Those used by more than one worker shall be thoroughly cleaned and disinfected after each use.

(6) Respirators shall be stored in a convenient, clean, and sanitary location.

(7) Respirators used routinely shall be inspected during cleaning. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use.

(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

(9) There shall be regular inspection and evaluation to determine the continued effectiveness of the program.

(10) Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (for instance, annually).

(11) Approved or accepted respirators shall be used when they are available. The respirator furnished shall provide adequate respiratory protection against the particular hazard for which it is designed in accordance with standards established by competent authorities. The U.S. Department of Interior, Bureau of Mines, and the U.S. Department of Agriculture are recognized as such authorities. Although respirators listed by the U.S. Department of Agriculture continue to be acceptable for protection against specified pesticides, the U.S. Department of the Interior, Bureau of Mines, is the agency now responsible for testing and approving pesticide respirators.

(c) *Selection of respirators.* Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.

(d) *Air quality.* (1) Compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration shall be of high purity. Oxygen shall meet the requirements of the United States Pharmacopoeia for medical or breathing oxygen. Breathing air shall meet at least the requirements of the specification for Grade D breathing air as described in Compressed Gas Association Commodity Specification G-7.1-1966. Compressed oxygen shall not be used in supplied-air respirators or in open circuit self-contained breathing apparatus that have previously used compressed air. Oxygen must never be used with air line respirators.

(2) Breathing air may be supplied to respirators from cylinders or air compressors.

(i) Cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR Part 178).

(ii) The compressor for supplying air shall be equipped with necessary safety and standby devices. A breathing air-

type compressor shall be used. Compressors shall be constructed and situated so as to avoid entry of contaminated air into the system and suitable in-line air purifying sorbent beds and filters installed to further assure breathing air quality. A receiver of sufficient capacity to enable the respirator wearer to escape from a contaminated atmosphere in event of compressor failure, and alarms to indicate compressor failure and overheating shall be installed in the system. If an oil-lubricated compressor is used, it shall have a high-temperature or carbon monoxide alarm, or both. If only a high-temperature alarm is used, the air from the compressor shall be frequently tested for carbon monoxide to insure that it meets the specifications in subparagraph (1) of this paragraph.

(3) Air line couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of air line respirators with nonrespirable gases or oxygen.

(4) Breathing gas containers shall be marked in accordance with American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954; Federal Specification BB-A-1034a, June 21, 1968, Air, Compressed for Breathing Purposes; or Interim Federal Specification GG-B-00675b, April 27, 1965, Breathing Apparatus, Self-Contained.

(e) *Use of respirators.* (1) Standard procedures shall be developed for respirator use. These should include all information and guidance necessary for their proper selection, use, and care. Possible emergency and routine uses of respirators should be anticipated and planned for.

(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued. Each respirator permanently assigned to an individual should be durably marked to indicate to whom it was assigned. This mark shall not affect the respirator performance in any way. The date of issuance should be recorded.

(3) Written procedures shall be prepared covering safe use of respirators in dangerous atmospheres that might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available respirators.

(i) In areas where the wearer, with failure of the respirator, could be overcome by a toxic or oxygen-deficient atmosphere, at least one additional man shall be present. Communications (visual, voice, or signal line) shall be maintained between both or all individuals present. Planning shall be such that one individual will be unaffected by any likely incident and have the proper rescue equipment to be able to assist the other(s) in case of emergency.

(ii) When self-contained breathing apparatus or hose masks with blowers

are used in atmospheres immediately dangerous to life or health, standby men must be present with suitable rescue equipment.

(iii) Persons using air line respirators in atmospheres immediately hazardous to life or health shall be equipped with safety harnesses and safety lines for lifting or removing persons from hazardous atmospheres or other and equivalent provisions for the rescue of persons from hazardous atmospheres shall be used. A standby man or men with suitable self-contained breathing apparatus shall be at the nearest fresh air base for emergency rescue.

(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

(5) For safe use of any respirator, it is essential that the user be properly instructed in its selection, use, and maintenance. Both supervisors and workers shall be so instructed by competent persons. Training shall provide the men an opportunity to handle the respirator, have it fitted properly, test its face-piece-to-face seal, wear it in normal air for a long familiarity period, and, finally, to wear it in a test atmosphere.

(i) Every respirator wearer shall receive fitting instructions including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to determine if it fits properly. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, a skull cap that projects under the facepiece, or temple pieces on glasses. Also, the absence of one or both dentures can seriously affect the fit of a facepiece. The worker's diligence in observing these factors shall be evaluated by periodic check. To assure proper protection, the facepiece fit shall be checked by the wearer each time he puts on the respirator. This may be done by following the manufacturer's facepiece fitting instructions.

(ii) Providing respiratory protection for individuals wearing corrective glasses is a serious problem. A proper seal cannot be established if the temple bars of eye glasses extend through the sealing edge of the full facepiece. As a temporary measure, glasses with short temple bars or without temple bars may be taped to the wearer's head. Wearing of contact lenses in contaminated atmospheres with a respirator shall not be allowed. Systems have been developed for mounting corrective lenses inside full facepieces. When a workman must wear corrective lenses as part of the facepiece, the facepiece and lenses shall be fitted by qualified individuals to provide good vision, comfort, and a gas-tight seal.

(iii) If corrective spectacles or goggles are required, they shall be worn so as not to affect the fit of the facepiece. Proper selection of equipment will minimize or avoid this problem.

(f) *Maintenance and care of respirators.* (1) A program for maintenance and

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care of respirators shall be adjusted to the type of plant, working conditions, and hazards involved, and shall include the following basic services:

- (i) Inspection for defects (including a leak check).
- (ii) Cleaning and disinfecting.
- (iii) Repair.
- (iv) Storage

Equipment shall be properly maintained to retain its original effectiveness.

(2) (i) All respirators shall be inspected routinely before and after each use. A respirator that is not routinely used but is kept ready for emergency use shall be inspected after each use and at least monthly to assure that it is in satisfactory working condition.

(ii) Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be fully charged according to the manufacturer's instructions. It shall be determined that the regulator and warning devices function properly.

(iii) Respirator inspection shall include a check of the tightness of connections and the condition of the facepiece, headbands, valves, connecting tube, and canisters. Rubber or elastomer parts shall be inspected for pliability and signs of deterioration. Stretching and manipulating rubber or elastomer parts with a massaging action will keep them pliable and flexible and prevent them from taking a set during storage.

(iv) A record shall be kept of inspection dates and findings for respirators maintained for emergency use.

(3) Routinely used respirators shall be collected, cleaned, and disinfected as frequently as necessary to insure that proper protection is provided for the wearer. Each worker should be briefed on the cleaning procedure and be assured that he will always receive a clean and disinfected respirator. Such assurances are of greatest significance when respirators are not individually assigned to workers. Respirators maintained for emergency use shall be cleaned and disinfected after each use.

(4) Replacement or repairs shall be done only by experienced persons with parts designed for the respirator. No attempt shall be made to replace components or to make adjustment or repairs beyond the manufacturer's recommendations. Reducing or admission valves or regulators shall be returned to the manufacturer or to a trained technician for adjustment or repair.

(5) (i) After inspection, cleaning, and necessary repair, respirators shall be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Respirators placed at stations and work areas for emergency use should be quickly accessible at all times and should be stored in compartments built for the purpose. The compartments should be clearly marked. Routinely

used respirators, such as dust respirators, may be placed in plastic bags. Respirators should not be stored in such places as lockers or tool boxes unless they are in carrying cases or cartons.

(ii) Respirators should be packed or stored so that the facepiece and exhalation valve will rest in a normal position and function will not be impaired by the elastomer setting in an abnormal position.

(iii) Instructions for proper storage of emergency respirators, such as gas masks and self-contained breathing apparatus, are found in "use and care" instructions usually mounted inside the carrying case lid.

(g) Identification of gas mask canisters. (1) The primary means of identifying a gas mask canister shall be by means of properly worded labels. The secondary means of identifying a gas mask canister shall be by a color code.

(2) All who issue or use gas masks falling within the scope of this section shall see that all gas mask canisters purchased or used by them are properly labeled and colored in accordance with these requirements before they are placed in service and that the labels and colors are properly maintained at all times thereafter until the canisters have completely served their purpose.

(3) On each canister shall appear in bold letters the following:

(1) —
Canister for
(Name for atmospheric contaminant)
or
Type N Gas Mask Canister

(ii) In addition, essentially the following wording shall appear beneath the appropriate phrase on the canister

label: "For respiratory protection in atmospheres containing not more than percent by volume of"

(Name of atmospheric contaminant)

(iii) All of the markings specified above should be placed on the most conspicuous surface or surfaces of the canister.

(4) Canisters having a special high-efficiency filter for protection against radionuclides and other highly toxic particulates shall be labeled with a statement of the type and degree of protection afforded by the filter. The label shall be affixed to the neck end of, or to the gray stripe which is around and near the top of, the canister. The degree of protection shall be marked as the percent of penetration of the canister by a 0.3-micron-diameter dioctyl phthalate (DOP) smoke at a flow rate of 85 liters per minute.

(5) Each canister shall have a label warning that gas masks should be used only in atmospheres containing sufficient oxygen to support life (at least 16 percent by volume), since gas mask canisters are only designed to neutralize or remove contaminants from the air.

(6) Each gas mask canister shall be painted a distinctive color or combination of colors indicated in Table I-1. All colors used shall be such that they are clearly identifiable by the user and clearly distinguishable from one another. The color coating used shall offer a high degree of resistance to chipping, scaling, peeling, blistering, fading, and the effects of the ordinary atmospheres to which they may be exposed under normal conditions of storage and use. Appropriately colored pressure sensitive tape may be used for the stripes.

TABLE I-1

Atmospheric contaminants to be protected against	Colors assigned*
Acid gases.....	White.
Hydrocyanic acid gas.....	White with 1/2-inch green stripe completely around the canister near the bottom.
Chlorine gas.....	White with 1/2-inch yellow stripe completely around the canister near the bottom.
Organic vapors.....	Black.
Ammonia gas.....	Green.
Acid gases and ammonia gas.....	Green with 1/2-inch white stripe completely around the canister near the bottom.
Carbon monoxide.....	Blue.
Acid gases and organic vapors.....	Yellow.
Hydrocyanic acid gas and chloropicrin vapor.....	Yellow with 1/2-inch blue stripe completely around the canister near the bottom.
Acid gases, organic vapors, and ammonia gases.....	Brown.
Radioactive materials, excepting tritium and noble gases.....	Purple (Magenta).
Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the above gases or vapors.....	Canister color for contaminant, as designated above, with 1/2-inch gray stripe completely around the canister near the top.
All of the above atmospheric contaminants.....	Red with 1/2-inch gray stripe completely around the canister near the top.

*Gray shall not be assigned as the main color for a canister designed to remove acids or vapors.

NOTE: Orange shall be used as a complete body, or stripe color to represent gases not included in this table. The user will need to refer to the canister label to determine the degree of protection the canister will afford.

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S.O.P.

Plant Use and Maintenance of Non-Emergency Type Respirators

POLICY: All employees who, during the normal course of their work, are exposed to concentrations of dust, organic vapors, fibrous materials, and other air contaminants in excess of the appropriate Threshold Limit Values as established by OSHA will wear U.S. Bureau of Mines or NIOSH approved respiratory protective devices to avoid acute and chronic respiratory effects.

DUTIES:

1. Plant Manager -

- a. Assume responsibility of insuring that procedures contained herein are being properly practiced.

2. Plant Safety Director -

- a. Administer and supervise the respiratory protective device program:

- (1) Determine job assignments which require respiratory protection by consulting with Divisional Environmental Control personnel.
- (2) Determine the proper type of respiratory protective equipment for each exposure by consulting with Divisional Environmental Control personnel.
- (3) Assign respirators and train individuals on their purpose and proper use to include fitting, exposure limitations, and maintenance.
- (4) Inspect plant operations to insure that respiratory protection is being used and maintained properly.
- (5) Provide one central cleaning station in the plant, and assign one person the responsibility for cleaning and maintaining respirators after each day's use as per the following:
 - (a) Unscrew filter cap and remove filter.
 - (b) Wash entire unit with paper tissue under warm water tap and germicidal cleaning solution provided.
 - (c) Thoroughly dry with paper towel tissue.
 - (d) Inspect two rubber valves. Replace if missing or damaged with supply provided.
 - (e) Replace filter cap and filter. It is not necessary to insert new filter until breathing is restricted. When replacing filter, the printed side should always be toward the face.
 - (f) It is unnecessary to use cotton face covers as such. However, they are provided. If used, they shall be discarded following daily use. Place used ones in receptacle provided.
 - (g) Return clean respirator to container and seal cover tightly.
 - (h) Keep container clean.

- (6) Provide for central storage and storage containers for each respirator in various working areas of the plant.
 - (7) Insure that respirators are cleaned on a daily basis and stored properly when not in use.
 - (8) Maintain records on respirator maintenance as well as on the physical fitness of all individuals required to wear respiratory equipment.
 - (9) Post this S.O.P. in each of the plant work areas where use of respiratory equipment is required.
3. Plant Line Supervisors -
- a. Assume responsibility of insuring that respirators are worn as required by the plant safety director.
 - b. Maintain housekeeping in such a manner as to preclude cleaning respirators more than once a day.
 - c. Complete forms as directed by safety personnel.
4. Employee -
- a. Wear respirator in a proper manner whenever encountering excessive contaminant exposures.
 - b. Check respirator function prior to each use.

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Year Inspected: _____

Equipment Inspected By: _____

Storage Area: _____

1. _____ 7. _____

Name and Type
of Equipment _____

2. _____ 8. _____

Serial Number _____

3. _____ 9. _____

4. _____ 10. _____

5. _____ 11. _____

6. _____ 12. _____

WRITE YOUR COMMENTS ON THE BACK OF THIS FORM

GAS MASKS

(Check lists are to be used monthly)

<u>YES</u>						<u>NO</u>						
1	2	3	4	5	6	1	2	3	4	5	6	Gas mask is stored in plastic bag or case.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Canister tape seal is intact.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	The canister is not out of date.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Are headstraps in good condition? (Check by stretching).
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Was the exhalation valve replaced within the last year?
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	The facepiece is in good condition and not cracked from age or badly worn.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	The facepiece lens is in good condition and not scratched or discolored badly enough to distort vision.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Hose, connections, and clamps are in good condition.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Mask is stored with straps in extended position.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Mask has been checked for leaks.
7	8	9	10	11	12	7	8	9	10	11	12	

Year Inspected: _____

Equipment Inspected By: _____

Storage Area: _____

1. _____ 7. _____

Name and Type
of Equipment _____

2. _____ 8. _____

3. _____ 9. _____

4. _____ 10. _____

5. _____ 11. _____

Serial Number _____

6. _____ 12. _____

WRITE YOUR COMMENTS ON THE BACK OF THIS FORM

RESPIRATORY EQUIPMENT CHECK LIST

Self-Contained Breathing Apparatus
(Check lists are to be used monthly)

<u>YES</u>						<u>NO</u>						
1	2	3	4	5	6	1	2	3	4	5	6	Gauge on air tank is within 10% maximum fill pressure.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Carrying case is in good condition. Hinges open freely, case protects SCBA, carrying handle is firmly attached to case, case is reasonably clean inside.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Firepiece lens is in good condition, not scratched or discolored badly enough to distort vision.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Headstraps are in good condition, can withstand a firm hand pull.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Metal parts such as cylinder clamps, facepiece clips, harness buckles, and regulators appear to be in good condition.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Mainline regulator valve and bypass valve are in good workable condition.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Carrying straps and belts are in good condition.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Hoses and connections are properly fitted and ready for instant use.
7	8	9	10	11	12	7	8	9	10	11	12	
1	2	3	4	5	6	1	2	3	4	5	6	Unit has been checked for leaks.
7	8	9	10	11	12	7	8	9	10	11	12	

BB 0002741

Title 40—Protection of Environment

CHAPTER 1—ENVIRONMENTAL
PROTECTION AGENCY

SUBCHAPTER C—AIR PROGRAMS

PART 61—NATIONAL EMISSION STANDARDS
FOR HAZARDOUS AIR POLLUTANTS

Asbestos, Beryllium, and Mercury

On March 31, 1971 (36 FR 5931), pursuant to section 112 of the Clean Air Act, as amended, the Administrator published an initial list of three hazardous air pollutants which, in his judgment may cause, or contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness. The pollutants were asbestos, beryllium, and mercury. On December 7, 1971 (36 FR 23239), the Administrator proposed standards for these pollutants.

Interested persons participated in the rulemaking by giving testimony at public hearings and by sending comments to EPA. Public hearings were held in New York City on January 18, 1972, and in Los Angeles on February 15 and 16, 1972. A third hearing, scheduled to be held in Kansas City, on February 1, 1972, was canceled because of a lack of requests to participate. Sixty-eight persons gave testimony at the public hearings, and 56 persons sent comments to EPA. Represented were industries, universities, governmental agencies—Federal, State, and local, and environmental groups. Copies of the public hearing records are available at all EPA Regional Offices and at the Division of Stationary Source Enforcement, room 3220, 401 M Street SW., Washington, D.C. 20460, where copies of the comments received are also available.

The bases for the Administrator's determinations that asbestos,

hazardous, the derivations of the standards now adopted, the Environmental Protection Agency's responses to the significant comments received, and the principal revisions to the proposed standards are summarized below. A more detailed statement is available on request from the Emission Standards and Engineering Division, Environmental Protection Agency, Research Triangle Park, N.C. 27711, Attention: Mr. Don Goodwin. In addition, the Administrator is issuing information on control techniques for asbestos, beryllium, and mercury as directed by section 112(b)(2) of the act. Copies of these documents may be obtained free of charge from EPA Regional Offices.

ASBESTOS

Asbestos is a hazardous air pollutant within the meaning of section 112. Many persons exposed to asbestos dust developed asbestosis when the dust concentration was high or the duration of exposure was long (1-7). A large number of studies have shown that there is an association between occupational exposure to asbestos and a higher-than-expected incidence of bronchial cancer (8-30). Asbestos also has been identified as a causal factor in the development of mesotheliomas, cancers of the mem-

branes lining the chest and abdomen (30-47). There are reports of mesothelioma associated with nonoccupational exposures in the neighborhood of asbestos sources (38, 42, 47, 48). An outstanding feature has been the long period, commonly over 30 years, between the first exposure to asbestos and the appearance of a tumor (49, 50). There is evidence which indicates that mesotheliomas occur after much less exposure to asbestos dust than the exposure associated with asbestos (51, 52).

It is not practicable, at this time, to establish allowable numerical concentrations or mass emission limits for asbestos. Satisfactory means of measuring ambient asbestos concentrations have only recently been developed, and satisfactory means of measuring asbestos emissions are still unavailable. Even if satisfactory means of measuring asbestos emissions did exist, the previous unavailability of a satisfactory means of measuring ambient levels of asbestos makes it impossible to estimate even roughly the quantitative relationship between asbestos-caused illness and the doses which caused those illnesses. This is a major problem, since some asbestos caused illnesses have a 30-year latency period.

EPA considered the possibility of banning production, processing, and use of asbestos or banning all emissions of asbestos into the atmosphere, but rejected these approaches. The problem of measuring asbestos emissions would make the latter approach impossible to enforce. Either approach would result in the prohibition of many activities which are extremely important; moreover, the available evidence relating to the health hazards of asbestos does not suggest that such prohibition is necessary to protect public health. For example, demolition of any building containing asbestos fireproofing or insulating materials would have to be prohibited as would the use of materials containing even trace amounts of asbestos which could escape into the atmosphere.

Finally, the available evidence suggests a gradient of effects from direct occupational, to indirect occupational exposure, to families of workers exposed to asbestos and persons in the neighborhood of asbestos sources—in all of which situations asbestos concentrations are undoubtedly high by comparison with most community air. This suggests that there are levels of asbestos exposure that will not be associated with any detectable risk, although these levels are not known (53).

It is probable that the effects of asbestos inhalation are cumulative; that is, low-level and/or intermittent exposure to asbestos over a long time may be equally as important in the etiology of asbestotic disease as high level and/or continuous exposure over a shorter period. On the other hand, the available evidence does not indicate that levels of asbestos in most community air cause asbestotic disease. Taking both these considerations into account, the Administrator has determined that, in order to provide an ample margin of safety to protect the public health from asbestos,

it is necessary to control emissions from major man-made sources of asbestos emissions into the atmosphere, but that it is not necessary to prohibit all emissions.

In this determination, the Administrator has relied on the National Academy of Sciences' report on asbestos (53), which concludes: "Asbestos is too important in our technology and economy for its essential use to be stopped. But, because of the known serious effects of uncontrolled inhalation of asbestos minerals in industry and uncertainty as to the shape and character of the dose-response curve in man, it would be highly imprudent to permit additional contamination of the public environment with asbestos. Continued use at minimal risk to the public requires that the major sources of man-made asbestos emission into the atmosphere be defined and controlled."

The means of control used are limitations on visible emissions with an option in some cases to use designated control equipment, requirements that certain procedures be followed, and prohibitions on the use of certain materials or of certain operations. These means of control are required because of the impossibility at this time of prescribing and enforcing allowable numerical concentrations or mass emission limitations known to provide an ample margin of safety. The alternative of no control of the sources subject to this standard was rejected because of the significant health hazard of unregulated emissions of asbestos into the atmosphere from the designated major sources.

It is the Administrator's judgment that the asbestos sources subject to this standard are the major sources of asbestos emissions. In the absence of quantitative emission data, the Administrator's judgment was based on a national inventory of sources and emissions of asbestos (54) and other reports (53, 55). The asbestos emissions and emission factors presented in the national inventory were based on information obtained from production and reprocessing companies. This information included production figures, estimates of control equipment efficiency and material balances; it did not include emission test results. The major sources of asbestos emissions were considered to fall into five categories: (1) Mining and milling; (2) manufacturing; (3) fabrication; (4) demolition; and (5) spraying. In determining which of these major sources should be covered by the standard promulgated herein, the Administrator considered the effect other Federal regulations will have on the emissions from such sources and the proximity of such sources to the public. In addition, the Administrator considered comments on the proposed standard and additional technical data not available before proposal. The following paragraphs explain these considerations and the changes made to the standard between proposal and final promulgation.

The promulgated standard applies to asbestos mills, selected manufacturing operations, the use of spray-on asbestos

References at end of article.

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materials, demolition operations, and the surfacing of roadways with asbestos tailings. The Administrator will continue to investigate other existing and new sources of asbestos emission and if any of them are found to be major sources, the standard will be revised to cover them.

As applied to mines, the proposed standard would have limited the emissions from drilling operations and prohibited visible emissions of particulate matter from mine roads surfaced with asbestos tailings. The Bureau of Mines has prescribed health and safety regulations (30 CFR 55.5) for the purpose of protecting life, the promotion of health and safety, and the prevention of accidents in open pit metal and nonmetallic mines. As related to asbestos mines, these regulations prohibit persons working in a mine from being exposed to asbestos concentrations which exceed the threshold limit value adopted by the American Conference of Governmental Industrial Hygienists. The regulations specify that respirators shall not be used to prevent persons from being exposed to asbestos where environmental measures are available. For drilling operations, the regulations require that the holes be collared and drilled wet. The regulations recommend that haulage roads, rock transfer points, crushers, and other points where dust (asbestos) is produced sufficient to cause a health or safety hazard be wetted down as often as necessary unless the dust is controlled adequately by other means. In the judgment of the Administrator, implementation of these regulations will prevent asbestos mines from being a major source which must be covered by the standard promulgated herein. Furthermore, the public is sufficiently removed from the mine work environment that their exposure should be significantly less than that of the workers in the work environment. Accordingly, the promulgated standard does not apply to drilling operations or roadways at mine locations.

For asbestos mills, the proposed standard would have applied to ore dumps, open storage areas for asbestos materials, tailings dumps, ore dryers, air for processing ore, air for exhausting particulate material from work areas, and any milling operation which continuously generates implant visible emissions. The promulgated standard prohibits visible emissions from any part of the mill, but it does not apply to dumps of asbestos tailings or open storage of asbestos ore. The Bureau of Mines' regulations previously referenced and regulations issued by the Occupational Safety and Health Administration (20 CFR 1910.93a) protect workers from the hazards of air contaminants in the work environment. The Occupational Safety and Health Administration regulations were promulgated on June 7, 1972. The regulations are intended to protect the health of employees from asbestos exposure by means of engineering controls (i.e. isolation, enclosures, and dust collection) rather than by personal protective equipment. It is the judgment of the Administrator that

measures taken to comply with the Bureau of Mines and Occupational Safety and Health Administration regulations to protect the health of persons who work in proximity to dumps and open storage areas will prevent the dumps and storage areas from being major sources of asbestos emissions.

The proposed standard would have applied to buildings, structures, or facilities within which any fabricating or manufacturing operation is carried on which involves the use of asbestos materials. Comments received in the proposed standard indicated that the requirements for fabricating and manufacturing operations were confusing. Much of the confusion was created by the use of terms such as "any," "continuously," and "forced gas streams." The promulgated standard is more definitive as to applicability of the provisions. The promulgated standard prohibits visible emissions from the nine manufacturing operations which, in the judgment of the Administrator, are major sources of asbestos. The promulgated standard does not cover fabrication operations. Of all fabrication operations, only those operations at new construction sites are considered to be major sources of asbestos emissions. The Occupational Safety and Health Administration regulations specify that all hand- or power-operated tools (i.e. saws, scorers, abrasive wheels, and drills) which produce asbestos dust be provided with dust collection systems. In the judgment of the Administrator, implementation of these regulations will prevent fabrication operations from being a major source which must be covered by the standard promulgated herein.

The proposed standard would have prohibited visible emissions of asbestos particulate material from the repair or demolition of any building or structure other than a single-family dwelling. Comments indicated that the no visible emission requirement would prohibit repair or demolition in many situations, since it would be impracticable, if not impossible, to do such work without creating visible emissions. Accordingly, the promulgated standard specifies certain work practices which must be followed when demolishing certain buildings or structures. The standard covers institutional, industrial, and commercial buildings or structures, including apartment houses having more than four dwelling units, which contain friable asbestos material. This coverage is based on the National Academy of Sciences' report (53) which states, "In general, single-family residential structures contain only small amounts of asbestos insulation. Demolition of industrial and commercial buildings that have been fireproofed with asbestos-containing materials will prove to be an emission source in the future, requiring control measures." Apartment houses with four dwelling units or less are considered to be equivalent to single-family residential structures. The standard requires that the Administrator be notified at least 20 days prior to the commencement of demolition.

The proposed standard would have limited emissions from a number of sources by stipulating that such emissions could not exceed the amounts which would be emitted from the source if the source were equipped with a fabric filter, or, in some cases, a wet-collection air-cleaning device. This would have required a standardized emission-measuring technique, which is not currently available. The promulgated standard prohibits visible emissions which contain asbestos and provides the option of using specified air-cleaning methods. The existence of particulate asbestos material in a gas stream vented to the atmosphere can be determined by collecting a sample on a filter and analyzing it by microscopy techniques. The proposed standard stated that the air-cleaning requirement would not be met if a number of listed faults, e.g., broken bags, leaking gases, threadbare bags, existed and it required that collection hoppers on some baghouses be emptied without generating visible emissions. Comments received suggested that this negative approach tended to make the quality of air-cleaning operations dependent upon the ability of EPA to anticipate and to include in the standard all the factors which would constitute improper methods. Since the intent was, and is, to require high quality air-cleaning operations, the promulgated standard requires proper installation, use, operation, and maintenance without precisely defining the means to be used.

The proposed standard would have prohibited the spraying of any material containing asbestos on any portion of a building or structure, prohibited the spraying of any material containing asbestos in an area directly open to the atmosphere, and limited emissions from all other spraying of any material containing asbestos to the amount which would be emitted if specified air-cleaning equipment were used. Comments received pointed out that this standard would: (1) Prohibit the use of materials containing only the trace amounts of asbestos which occur in numerous natural substances, (2) prohibit the use of materials to which very small quantities of asbestos are added in order to enhance their effectiveness, and (3) prohibit the use of materials in which the asbestos is strongly bound and which would not generate particulate asbestos emissions. The promulgated standard applies to those uses of spray-on asbestos materials which could generate major emissions of particulate asbestos material. For those spray-on materials used to insulate or fireproof buildings, structures, pipes, and conduits, the standard limits the asbestos content to no more than 1 percent. Materials currently used contain from 10- to 80-percent asbestos. The intent of the 1-percent limit is to ban the use of materials which contain significant quantities of asbestos, but to allow the use of materials which would: (1) Contain trace amounts of asbestos which occur in numerous natural substances, and (2) include very small quantities of asbestos (less than 1 percent) added to enhance the material's effectiveness. Although a

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standardized reference method has not been developed to quantitatively determine the content of asbestos in a material, there are acceptable methods available, based on electron microscopy, which independent laboratories have developed. Determining the asbestos content of a material with these methods costs approximately \$300, and the results are accurate within plus or minus 50 percent; these limits on accuracy were taken into account in establishing the 1-percent limitation.

The proposed standard would have prohibited the surfacing of any roadway with asbestos tailings. The promulgated standard applies to all roadways except those on ore deposits; these roadways are temporary, and control measures taken to comply with the Bureau of Mines regulations prevent them from being a major source which must be covered by the standard promulgated herein. At this time, the application of asbestos tailings to public roadways is not widely practiced, but because of the close proximity of roads to the public, a ban on using asbestos tailings on roadways is included in the promulgated standard to avoid a future problem and stop the practice where it is followed. The term "surfacing" is defined to include the deposit of asbestos tailings on roadways covered with snow or ice; therefore, this practice is prohibited.

Consideration was given to including provisions in the standard requiring proper disposal of the asbestos material generated during demolition and collected in control devices used to comply with the requirements of this standard. It was decided that this was not necessary because the Occupational Safety and Health Administration regulations (29 CFR 1910.93a(h)) include house-keeping and waste disposal requirements. These regulations require that any asbestos waste, consigned for disposal, be collected and disposed of in sealed impermeable bags or other closed, impermeable containers.

The potential environmental impact of the promulgated standard was evaluated, and it was concluded that the standard will not cause any adverse effects. The potentially adverse environmental effects of the standard are:

(1) The asbestos-materials which will be collected in control devices and generated during demolition will have to be disposed of or recycled.

(2) Materials, such as mineral wool, ceramic wool, and fiberglass, will be substituted for asbestos presently contained in spray-applied fireproofing and insulating materials.

In some manufacturing operations, a major portion of the asbestos-material collected by fabric filters is either recycled to the process or is marketed for other uses. For example, one asbestos textile mill recycles large quantities of longer-fiber asbestos for process use and sells more than 90 percent of the remaining collected materials to a brake lining manufacturer. Consequently, a significant portion of the increased quantities of "waste" asbestos materials which will result from the implementation of the

standard will not require disposal. Where disposal is required, the Occupational Safety and Health Administration regulations (29 CFR 1910.93a(h)) require that any asbestos waste, consigned for disposal, be collected and disposed of in sealed impermeable bags or other closed, impermeable containers. The contamination of ground water supplies with asbestos from landfill disposal is not considered a potential problem.

The substitution of ceramic wool, mineral wool, and fiberglass for asbestos is not now known to be a problem. There is no evidence that these materials cause health effects in the concentrations found in occupational or ambient environments.

Although the standard was not based on economic considerations, EPA is aware of the impact (55) and considers it to be reasonable. Costs among the various sources covered by the standard are quite variable. Although the standard may adversely affect some individual plants or companies which are marginal operations, it appears that such effects will be minimal and the impact to the asbestos industries as a whole will not be large.

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The standards promulgated below are applicable to new, modified, and existing sources. Any new or modified source must comply with the standards upon beginning operation. Any existing source must comply with the standards within 90 days after promulgation, unless a waiver of compliance is granted.

After considering the proposed general provisions and the comments received on them, the Administrator made several changes which are included in the standards promulgated below. A new section was added to specifically require new stationary sources to notify the Administrator before beginning operation. The requirements for source reporting and request for waiver of compliance were combined into one section. The time for submitting the source report was extended from 30 to 90 days to provide sources with more time to complete the information required. Appendix A was added to provide sources a description and format of the information required.

The proposed standards required all sources of mercury and beryllium to test their emissions within 3 months of the effective date and at least once every 3 months thereafter; a provision was included to allow the Administrator to waive the periodic tests for sources in compliance with a standard. The standards promulgated below require the initial test within 90 days of the effective date and include a provision to allow the Administrator to waive this requirement if the source is meeting the standard or has requested a waiver of compliance. Periodic tests are not required unless specifically requested by the Administrator. The Administrator may cancel a waiver of emission tests and may require a test under the authority of section 114 of the Act at any time. Appendix A specifies the information which a source must provide the Administrator when applying for a waiver of initial emission testing.

The standards promulgated below do not require the owner or operator to request a waiver of compliance before a specific date. However, the owner or operator should submit the request within 30 days after the effective date of the regulation to be assured that action will be taken on the waiver application prior to the 90th day after the effective date. Continued operation in excess of a standard after the 90th day without a waiver is a violation of the act.

The Administrator may grant an existing source a waiver, permitting a period of up to 2 years for compliance, provided that steps will be taken during the waiver period to assure that the health of persons will be protected from imminent endangerment and provided that such period is necessary for the installation of controls. To be granted a waiver of compliance, a source must submit a written request to the Administrator and provide certain information to assist the Administrator in making a judgment.

Within 60 days after receiving a request, the Administrator will notify the owner or operator of approval or intention to deny the waiver. Any waiver of compliance granted by the Administrator will be in writing and specify conditions the source must meet during the waiver period. If the Administrator intends to deny a request, the owner or operator will be given a specified time to provide additional information or arguments prior to final action on the request. Final action on a request will be in writing by the Administrator, and if denied, will include reasons for denial.

The President may exempt any new, modified, or existing stationary source from compliance with the standards for a period of up to 2 years, provided the technology is not available to implement the standards and the operation of such source is required for reasons of national security. Also, the President may grant exemptions for additional periods of 2 years or less.

The construction of a new source or modification of an existing source covered by these standards cannot begin without approval of the Administrator. To obtain approval, the owner or operator of such sources must apply in writing to the Administrator. Within 60 days, the Administrator will notify the owner or operator of approval or intention to deny approval. If the Administrator intends to deny approval, a specified time will be given to provide additional information or arguments prior to final action on the application. The final action on any application will be in writing by the Administrator, and if denied, will include the reasons for denial.

Although the demolition of buildings or structures containing asbestos material and the spraying of asbestos material will in many cases be modifications of existing stationary sources, the Administrator's approval is not required before beginning such operations. Section 112(c)(1) of the act specifies that no person may construct any new source or modify any existing source " * * * unless the Administrator finds that such source if properly operated will not cause emissions in violation of such standard." The demolition and spraying provisions are expressed in terms of procedures to be followed. Therefore, if the source is properly operated, it will be complying with the standard, and there is no need for the Administrator to make a finding with respect to each new source subject to these provisions.

Each source covered by these standards is required to submit to the Administrator within 90 days after promulgation certain information pertaining to its operation. Changes in the information must be submitted within 30 days after the change, except where the change is considered a modification. Then the requirements for a modified source are applicable.

Three terms are associated with determining compliance by means of source testing: (1) Reference method, (2) equivalent method, and (3) alternative method. Reference methods are the pre-

ferred methods of sampling and analyzing used to determine compliance. The reference methods for beryllium and mercury are included in appendix B to this part. An equivalent method is any method of sampling and analyzing which has been demonstrated to the Administrator's satisfaction to have a consistent and quantitatively known relationship to the reference method under specified conditions. An alternative method is any method of sampling and analyzing which does not meet all the criteria for equivalency but which can be used in specific cases to determine compliance. Alternative methods may be approved by the Administrator for source testing; however, in cases where determinations of compliance using an alternative method are disputed, use of the reference method or its equivalent will be required by the Administrator. An approved alternative method for beryllium is included in appendix B hereto.

All emission data provided to or obtained by the Administrator in carrying out these regulations will be available to the public. Records, reports, or information other than trade secrets will be available to the public.

Pursuant to section 112(d) (1) of the act, the Environmental Protection Agency intends to delegate the authority to implement and enforce national emission standards (except with respect to stationary sources owned or operated by the United States) for hazardous air pollutants to any State which submits an adequate procedure to the Administrator. The requisite procedure for requesting such delegation will be issued in the future by the Environmental Protection Agency.

The regulations for the national emission standards for asbestos, beryllium, and mercury are hereby promulgated effective upon promulgation (April 6, 1973).

Dated: March 30, 1973.

ROBERT W. FRI,
Acting Administrator,
Environmental Protection Agency.

A new Part 61 is added to Chapter 1, Title 40, Code of Federal Regulations, as follows:

Subpart A—General Provisions

Sec.	
61.01	Applicability.
61.02	Definitions.
61.03	Abbreviations.
61.04	Address.
61.05	Prohibited activities.
61.06	Determination of construction or modification.
61.07	Application for approval of construction or modification.
61.08	Approval by Administrator.
61.09	Notification of startup.
61.10	Source reporting and waiver request.
61.11	Waiver of compliance.
61.12	Emission tests and monitoring.
61.13	Waiver of emission tests.
61.14	Source test and analytical methods.
61.15	Availability of information.
61.16	State authority.

Subpart B—National Emission Standard for Asbestos

61.20	Applicability.
61.21	Definitions.

Subpart A—General Provisions

§ 61.01 Applicability.

The provisions of this part apply to the owner or operator of any stationary source for which a standard is prescribed under this part.

§ 61.02 Definitions.

As used in this part, all terms not defined herein shall have the meaning given them in the act:

(a) "Act" means the Clean Air Act (42 U.S.C. 1857 et seq.).

(b) "Administrator" means the Administrator of the Environmental Protection Agency or his authorized representative.

(d) "Commenced" means that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

(e) "Compliance schedule" means the date or dates by which a source or category of sources is required to comply with the standards of this part and with any steps toward such compliance which are set forth in a waiver of compliance under § 61.11.

(f) "Construction" means fabrication, erection, or installation of a stationary source.

(g) "Effective date" is the date of promulgation in the Federal Register of an applicable standard or other regulation under this part.

(i) "Existing source" means any stationary source which is not a new source.

(j) "Modification" means any physical change in, or change in the method of operation of, a stationary source which increases the amount of any hazardous air pollutant emitted by such source or which results in the emission of any hazardous air pollutant not previously emitted, except that:

(1) Routine maintenance, repair, and replacement shall not be considered physical changes, and

(2) The following shall not be considered a change in the method of operation:

(i) An increase in the production rate, if such increase does not exceed the operating design capacity of the stationary source;

(ii) An increase in hours of operation.

(k) "New source" means any stationary source, the construction or modification of which is commenced after the publication in the Federal Register of proposed national emission standards for hazardous air pollutants which will be applicable to such source.

(l) "Owner or operator" means any person who owns, leases, operates, controls, or supervises a stationary source.

(n) "Startup" means the setting in operation of a stationary source for any purpose.

(o) "Standard" means a national emission standard for a hazardous air pollutant proposed or promulgated under this part.

(p) "Stationary source" means any building, structure, facility, or installation which emits or may emit any air pollutant which has been designated as hazardous by the Administrator.

§ 61.04 Address.

All requests, reports, applications, submittals, and other communications to the Administrator pursuant to this part shall be submitted in duplicate and addressed to the appropriate regional office of the Environmental Protection Agency, to the attention of the Director, Enforcement Division. The regional offices are as follows:

Region I (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont), John F. Kennedy Federal Building, Boston, Mass. 02203.

Region II (New York, New Jersey, Puerto Rico, Virgin Islands), Federal Office Building, 26 Federal Plaza (Foley Square), New York, N.Y. 10007.

Region III (Delaware, District of Columbia, Pennsylvania, Maryland, Virginia, West Virginia), Curtis Building, Sixth and Walnut Streets, Philadelphia, Pa. 19106.

Region IV (Alabama, Florida, Georgia, Mississippi, Kentucky, North Carolina, South Carolina, Tennessee), Suite 300, 1421 Peachtree Street, Atlanta, Ga. 30309.

Region V (Illinois, Indiana, Minnesota, Michigan, Ohio, Wisconsin), 1 North Wacker Drive, Chicago: Ill. 60606.

Region VI (Arkansas, Louisiana, New Mexico, Oklahoma, Texas), 1600 Pater-son Street, Dallas, Tex. 75201.

Region VII (Iowa, Kansas, Missouri, Nebraska), 1735 Baltimore Street, Kansas City, Mo. 64108.

Region VIII (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming), 916 Lincoln Towers, 1860 Lincoln Street, Denver, Colo. 80203.

Region IX (Arizona, California, Hawaii, Nevada, Guam, American Samoa), 100 California Street, San Francisco, Calif. 94111.

Region X (Washington, Oregon, Idaho, Alaska), 1200 Sixth Avenue, Seattle, Wash. 98101.

§ 61.05 Prohibited activities.

(a) After the effective date of any standard prescribed under this part, no owner or operator shall construct or modify any stationary source subject to such standard without first obtaining written approval of the Administrator in accordance with this subpart, except under an exemption granted by the President under section 112(c) (2) of the act. Sources, the construction or modification

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of which commenced after the publication date of the standards proposed to be applicable to such source, are subject to this prohibition.

(b) After the effective date of any standard prescribed under this part, no owner or operator shall operate any new source in violation of such standard except under an exemption granted by the President under section 112(c) (2) of the act.

(c) Ninety days after the effective date of any standard prescribed under this part, no owner or operator shall operate any existing stationary source in violation of such standard, except under a waiver granted by the Administrator in accordance with this subpart or under an exemption granted by the President under section 112(c) (2) of the act.

(d) No owner or operator subject to the provisions of this part shall fail to report, revise reports, or report source test results as required under this part.

§ 61.06 Determination of construction or modification.

Upon written application by an owner or operator, the Administrator will make a determination of whether actions taken or intended to be taken by such owner or operator constitute construction or modification or the commencement thereof within the meaning of this part. The Administrator will within 30 days of receipt of sufficient information to evaluate an application, notify the owner or operator of his determination.

§ 61.07 Application for approval of construction or modification.

(a) The owner or operator of any new source to which a standard prescribed under this part is applicable shall, prior to the date on which construction or modification is planned to commence, or within 30 days after the effective date in the case of a new source that already has commenced construction or modification and has not begun operation, submit to the Administrator an application for approval of such construction or modification. A separate application shall be submitted for each stationary source.

(b) Each application shall include:

(1) The name and address of the applicant.

(2) The location or proposed location of the source.

(3) Technical information describing the proposed nature, size, design, operating design capacity, and method of operation of the source, including a description of any equipment to be used for control of emissions. Such technical information shall include calculations of emission estimates in sufficient detail to permit assessment of the validity of such calculations.

§ 61.08 Approval by Administrator.

(a) The Administrator will, within 60 days of receipt of sufficient information to evaluate an application under § 61.07, notify the owner or operator of approval or intention to deny approval of construction or modification.

(b) If the Administrator determines that a stationary source for which an

application pursuant to § 61.07 was submitted will, if properly operated, not cause emissions in violation of a standard, he will approve the construction or modification of such source.

(c) Prior to denying any application for approval of construction or modification pursuant to this section, the Administrator will notify the owner or operator making such application of the Administrator's intention to issue such denial, together with:

(1) Notice of the information and findings on which such intended denial is based, and

(2) Notice of opportunity for such owner or operator to present, within such time limit as the Administrator shall specify, additional information or arguments to the Administrator prior to final action on such application.

(d) A final determination to deny any application for approval will be in writing and will set forth the specific grounds on which such denial is based. Such final determination will be made within 60 days of presentation of additional information or arguments, or 60 days after the final date specified for presentation, if no presentation is made.

(e) Neither the submission of an application for approval nor the Administrator's granting of approval to construct or modify shall:

(1) Relieve an owner or operator of legal responsibility for compliance with any applicable provision of this part or of any other applicable Federal, State, or local requirement, or

(2) Prevent the Administrator from implementing or enforcing this part or taking any other action under the act.

§ 61.09 Notification of startup.

(a) Any owner or operator of a source which has an initial startup after the effective date of a standard prescribed under this part shall furnish the Administrator written notification as follows:

(1) A notification of the anticipated date of initial startup of the source not more than 60 days nor less than 30 days prior to such date.

(2) A notification of the actual date of initial startup of the source within 15 days after such date.

§ 61.10 Source reporting and waiver request.

(a) The owner or operator of any existing source, or any new source to which a standard prescribed under this part is applicable which had an initial startup which preceded the effective date of a standard prescribed under this part shall, within 90 days after the effective date, provide the following information in writing to the Administrator:

(1) Name and address of the owner or operator.

(2) The location of the source.

(3) The type of hazardous pollutants emitted by the stationary source.

(4) A brief description of the nature, size, design, and method of operation of the stationary source including the operating design capacity of such source. Identify each point of emission for each hazardous pollutant.

(5) The average weight per month of the hazardous materials being processed by the source, over the last 12 months preceding the date of the report.

(6) A description of the existing control equipment for each emission point.

(i) Primary control device(s) for each hazardous pollutant.

(ii) Secondary control device(s) for each hazardous pollutant.

(iii) Estimated control efficiency (percent) for each control device.

(7) A statement by the owner or operator of the source as to whether he can comply with the standards prescribed in this part within 90 days of the effective date.

(b) The owner or operator of an existing source unable to operate in compliance with any standard prescribed under this part may request a waiver of compliance with such standard for a period not exceeding 2 years from the effective date. Any request shall be in writing and shall include the following information:

(1) A description of the controls to be installed to comply with the standard.

(2) A compliance schedule, including the date each step toward compliance will be reached. Such list shall include as a minimum the following dates:

(i) Date by which contracts for emission control systems or process modifications will be awarded, or date by which orders will be issued for the purchase of component parts to accomplish emission control or process modification;

(ii) Date of initiation of onsite construction or installation of emission control equipment or process change;

(iii) Date by which onsite construction or installation of emission control equipment or process modification is to be completed; and

(iv) Date by which final compliance is to be achieved.

(3) A description of interim emission control steps which will be taken during the waiver period.

(c) Changes in the information provided under paragraph (a) of this section shall be provided to the Administrator within 30 days after such change, except that if changes will result from modification of the source, as defined in § 61.02 (j), the provisions of § 61.07 and § 61.08 are applicable.

(d) The format for reporting under this section is included as appendix A of this part. Advice on reporting the status of compliance may be obtained from the Administrator.

§ 61.11 Waiver of compliance.

(a) Based on the information provided in any request under § 61.10, or other information, the Administrator may grant a waiver of compliance with a standard for a period not exceeding 2 years from the effective date of such standard.

(b) Such waiver will be in writing and will:

(1) Identify the stationary source covered.

(2) Specify the termination date of the waiver. The waiver may be terminated at an earlier date if the conditions

specified under paragraph (b) (3) of this section are not met.

(3) Specify dates by which steps toward compliance are to be taken; and impose such additional conditions as the Administrator determines to be necessary to assure installation of the necessary controls within the waiver period, and to assure protection of the health of persons during the waiver period.

(c) Prior to denying any request for a waiver pursuant to this section, the Administrator will notify the owner or operator making such request of the Administrator's intention to issue such denial, together with:

(1) Notice of the information and findings on which such intended denial is based, and

(2) Notice of opportunity for such owner or operator to present, within such time limit as the Administrator specifies, additional information or arguments to the Administrator prior to final action on such request.

(d) A final determination to deny any request for a waiver will be in writing and will set forth the specific grounds on which such denial is based. Such final determination will be made within 60 days after presentation of additional information or arguments, or 60 days after the final date specified for such presentation, if no presentation is made.

(e) The granting of a waiver under this section shall not abrogate the Administrator's authority under section 114 of the act.

Subpart B—National Emission Standard for Asbestos

§ 61.20 Applicability.

The provisions of this subpart are applicable to those sources specified in § 61.22.

§ 61.21 Definitions.

Terms used in this subpart are defined in the act, in subpart A of this part, or in this section as follows:

(a) "Asbestos" means actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite.

(b) "Asbestos material" means asbestos or any material containing asbestos.

(c) "Particulate asbestos material" means finely divided particles of asbestos material.

(d) "Asbestos tailings" means any solid waste product of asbestos mining or milling operations which contains asbestos.

(e) "Outside air" means the air outside buildings and structures.

(f) "Visible emissions" means any emissions which are visually detectable without the aid of instruments and which contain particulate asbestos material.

§ 61.22 Emission standard.

(a) Asbestos mills: There shall be no visible emissions to the outside air from any asbestos mill except as provided in paragraph (f) of this section. Outside storage of asbestos materials is not considered a part of an asbestos mill.

(b) Roadways: The surfacing of roadways with asbestos tailings is prohibited, except for temporary roadways on an area of asbestos ore deposits. The deposition of asbestos tailings on roadways covered with snow or ice is considered "surfacing."

(c) Manufacturing: There shall be no visible emissions to the outside air, except as provided in paragraph (f) of this section, from any building or structure in which the following operations are conducted or directly from any of the following operations if they are conducted outside of buildings or structures.

(1) The manufacture of cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, or other textile materials.

(2) The manufacture of cement products.

(3) The manufacture of fireproofing and insulating materials.

(4) The manufacture of friction products.

(5) The manufacture of paper, millboard, and felt.

(6) The manufacture of floor tile.

(7) The manufacture of paints, coatings, caulks, adhesives, sealants.

(8) The manufacture of plastics and rubber materials.

(9) The manufacture of chlorine.

(d) Demolition: Any owner or operator of a demolition operation who intends to demolish any institutional, commercial, or industrial building (including apartment buildings having more than four dwelling units), structure, facility,

installation, or portion thereof which contains any boiler, pipe, or load-supporting structural member that is insulated or fireproofed with friable asbestos material shall comply with the requirements set forth in this paragraph.

(1) Notice of intention to demolish shall be provided to the Administrator at least 20 days prior to commencement of such demolition or anytime prior to commencement of demolition subject to paragraph (d) (4) of this section.

Such notice shall include the following information:

(i) Name of owner or operator.

(ii) Address of owner or operator.

(iii) Description of the building, structure, facility, or installation to be demolished.

(iv) Address or location of the building, structure, facility or installation.

(v) Scheduled starting and completion dates of demolition.

(vi) Method of demolition to be employed.

(vii) Procedures to be employed to meet the requirements of this paragraph.

(2) The following procedures shall be used to prevent emissions of particulate asbestos material to outside air:

(i) Friable asbestos materials, used to insulate or fireproof any boiler, pipe, or load-supporting structural member, shall be wetted and removed from any building, structure, facility, or installation subject to this paragraph before wrecking of load-supporting structural members is commenced. The friable asbestos debris shall be wetted adequately to insure that such debris remains wet during all stages of demolition and related handling operations.

(ii) No pipe or load-supporting structural member that is covered with friable asbestos insulating or fireproofing material shall be dropped or thrown to the ground from any building, structure, facility, or installation subject to this paragraph, but shall be carefully lowered or taken to ground level.

(iii) No friable asbestos debris shall be dropped or thrown to the ground from any building, structure, facility, or installation subject to this paragraph or from any floor to any floor below. For buildings, structures, facilities, or installations, 50 feet or greater in height, friable asbestos debris shall be transported to the ground via dust-tight chutes or containers.

(3) Sources subject to this paragraph are exempt from the requirements of §§ 61.05(a), 61.07, and 61.09.

(4) Any owner or operator of a demolition operation who intends to demolish a building, structure, facility, or installation to which the provisions of this paragraph would be applicable but which has been declared by proper State or local authority to be structurally unsound and which is in danger of imminent collapse is exempt from the requirements of this paragraph other than the reporting requirements specified by paragraph (d) (1) of this section and the wetting of friable asbestos debris as specified by paragraph (d) (3) (i) of this section.

§ 61.16 State authority.

(a) The provisions of this part shall not be construed in any manner to preclude any State or political subdivision thereof from:

(1) Adopting and enforcing any emission limiting regulation applicable to a stationary source, provided that such emission limiting regulation is not less stringent than the standards prescribed under this part.

(2) Requiring the owner or operator of a stationary source, other than a stationary source owned or operated by the United States, to obtain permits, licenses, or approvals prior to initiating construction, modification, or operation of such source.

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(e) Spraying: There shall be no visible emissions to the outside air from the spray-on application of materials containing more than 1 percent asbestos, on a dry weight basis, used to insulate or fireproof equipment and machinery, except as provided in paragraph (f) of this section. Spray-on materials used to insulate or fireproof buildings, structures, pipes, and conduits shall contain less than 1 percent asbestos on a dry weight basis.

(1) Sources subject to this paragraph are exempt from the requirements of § 61.05(a), § 61.07, and § 61.09.

(2) Any owner or operator who intends to spray asbestos materials to insulate or fireproof buildings, structures, pipes, conduits, equipment, and machinery shall report such intention to the administrator at least 20 days prior to the commencement of the spraying operation. Such report shall include the following information:

- (i) Name of owner or operator.
- (ii) Address of owner or operator.
- (iii) Location of spraying operation.
- (iv) Procedures to be followed to meet the requirements of this paragraph.

(f) Rather than meet the no-visible-emission requirements of paragraphs (a), (c), and (e) of this section, an owner or operator may elect to use the methods specified by § 61.23 to clean emissions containing particulate asbestos material before such emissions escape to, or are vented to, the outside air.

§ 61.23 Air-cleaning.

If air-cleaning is elected, as permitted by § 61.22(f), the requirements of this section must be met.

(a) Fabric filter collection devices must be used, except as noted in paragraphs (b) and (c) of this section. Such devices must be operated at a pressure drop of no more than 4 inches water gage, as measured across the filter fabric. The airflow permeability, as determined by ASTM method D737-69, must not exceed 30 ft³/min/ft² for woven fabrics or 35 ft³/min/ft² for felted fabrics, except that 40 ft³/min/ft² for woven and 45 ft³/min/ft² for felted fabrics is allowed for filtering air from asbestos ore dryers. Each square yard of felted fabric must weigh at least 14 ounces and be at least one-sixteenth inch thick throughout. Synthetic fabrics must not contain fill yarn other than that which is spun.

(b) If the use of fabric filters creates a fire or explosion hazard, the administrator may authorize the use of wet collectors designed to operate with a unit contacting energy of at least 40 inches water gage pressure.

(c) The administrator may authorize the use of filtering equipment other than that described in paragraphs (a) and (b) of this section if the owner or operator demonstrates to the satisfaction of the administrator that the filtering of particulate asbestos material is equivalent to that of the described equipment.

(d) All air-cleaning equipment authorized by this section must be properly installed, used, operated, and maintained. Bypass devices may be used only during upset or emergency conditions and then

only for so long as it takes to shut down the operation generating the particulate asbestos material.

§ 61.24 Reporting.

The owner or operator of any existing source to which this subpart is applicable shall, within 90 days after the effective date, provide the following information to the administrator:

(a) A description of the emission control equipment used for each process;

(b) If a fabric filter device is used to control emissions, the pressure drop across the fabric filter in inches water gage.

(1) If the fabric filter device utilizes a woven fabric, the airflow permeability in ft³/min/ft²; and, if the fabric is synthetic, indicate whether the fill yarn is spun or not spun.

(2) If the fabric filter device utilizes a felted fabric, the density in oz/yd², the minimum thickness in inches, and the airflow permeability in ft³/min/ft².

(c) Such information shall accompany the information required by § 61.10. The appropriate form is contained in appendix A to this part.

APPENDIX A

National Emission Standards for Hazardous Air Pollutants

Compliance Status Information

I. SOURCE REPORT

Instructions: Owners or operators of sources of hazardous pollutants subject to the National Emission Standards for Hazardous Air Pollutants are required to submit the information contained in Section I to the appropriate Environmental Protection Agency Regional Office before (date which is 90 days after the standards are promulgated). A listing of regional offices is provided in § 61.04.

EPA USE ONLY			
1	R	S	C
13			
19	AQCR	RP	CITY
28			NDC
80			

A. SOURCE INFORMATION.

1. Identification/Location - Indicate the name and address of each source.

A29				A48
COMPANY NAME				
A49				A68
NUMBER STREET ADDRESS				
B19			B33	B34 B38
CITY		STATE	ZIP CODE	
COUNTY				

2. Contact - Indicate the name and telephone number of the owner or operator or other responsible official whom EPA may contact concerning this report.

B39				B53
NAME				
B54				B63
TELEPHONE				

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2

3. Source Description - Briefly state the nature of the source (e.g., "Chlor-alkali Plant", or "Machine Shop").

C19 _____ C43

4. Alternative Mailing Address - Indicate an alternative mailing address if correspondence is to be directed to a location different than that specified above.

C44 _____ C63

NUMBER STREET ADDRESS

C64 _____ C77 C78 C79 D75 D79

CITY STATE ZIP CODE

5. Compliance Status - The emissions from this source can cannot meet the emission limitations contained in the National Emission Standards on or before (date which is 90 days after the promulgation of the standards).

Signature of owner, operator or other responsible official

NOTE: If the emissions from the source will exceed those limits set by the National Emission Standards for Hazardous Air Pollutants, the source will be in violation and subject to Federal enforcement actions unless granted a waiver of compliance by the Administrator of the Environmental Protection Agency. The information needed for such waivers is listed in Section II of this form.

EPA USE ONLY G14 G15 G46 G53

EP SCC

- B. PROCESS INFORMATION. Part B should be completed separately for each point of emission for each hazardous pollutant.

3

1. Process Description - Provide a brief description of each process (e.g., "hydrogen end box" in a mercury chlor-alkali plant, "grinding machine" in a beryllium machine shop). Use additional sheets if necessary.

G21 _____ G45

2. Pollutant Emitted - Indicate the type of hazardous pollutant emitted by the process. Indicate "AB" for asbestos, "BE" for beryllium, or "HG" for mercury.

G19 G20

3. Amount of Pollutant - Indicate the average weight of the hazardous material named in item 2 which enters the process in pounds per month (based on the previous twelve months of operation).

G54 _____ G60

4. Control Devices

- a. Indicate the type of pollution control devices, if any, used to reduce the emissions from the process (e.g., venturi scrubber, baghouse, wet cyclone) and the estimated percent of the pollutant which the device removes from the process gas stream.

H19 _____ H34 H51 H53

PRIMARY CONTROL DEVICE TYPE PERCENT REMOVAL EFFICIENCY

H35 _____ H50 H54 H56

SECONDARY CONTROL DEVICE TYPE PERCENT REMOVAL EFFICIENCY

- b. Asbestos Emission Control Devices Only

1. If a baghouse is specified in item 4a give the following information:

- The air flow permeability in cubic feet per minute per square foot of fabric area:

Air flow permeability = _____ cfm/ft²

- The pressure drop in inches water gauge across the filter at which the baghouse is operated

Operating pressure drop = _____ inches w.g.

- If the baghouse material contains synthetic fill yarn, check whether this material is spun ☐ or not spun ☐.

If the baghouse utilizes a felted fabric, give the minimum thickness in inches and the density in ounces per square yard.

Thickness = _____ inches Density = _____ oz/yd²

11. If a wet collection device is specified in item 4a, give the designed unit contacting energy in inches water gauge,

Unit contacting energy = _____ inches w.g.

EPA USE ONLY

CC 187 ☐

II. WAIVER REQUESTS

- A. WAIVER OF COMPLIANCE. Owners or operators of sources unable to operate in compliance with the National Emission Standards for Hazardous Air Pollutants by (date which is 90 days after the standards are promulgated) may request a waiver of compliance from the Administrator of the Environmental Protection Agency for the time period necessary to install appropriate control devices or make modifications to achieve compliance. The Administrator may grant a waiver of compliance with the standard for a period not exceeding two years from the effective date of the hazardous pollutant standards if he finds that such period is necessary for the installation of controls and that steps will be taken during the period of the waiver to assure that the health of persons will be protected from imminent endangerment.

EPA USE ONLY									
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The reporting information provided in Section I must accompany this application. Applications should be sent to the appropriate EPA regional office.

1. Processes Involved - Indicate the process or processes emitting hazardous pollutants to which emission controls are to be applied.

2. Controls

- a. Describe the proposed type of control device to be added or modification to be made to the process to reduce the emissions of hazardous pollutants to an acceptable level. Use additional sheets if necessary.

- b. Describe the measures that will be taken during the waiver period to assure that the health of persons will be protected from imminent endangerment. Use additional sheets if necessary.

3. Increments of Progress - specify the dates by which the following increments of progress will be met.

Date by which contracts for emission control systems or process modifications will be awarded; or date by which orders will be issued for the purchase of the component parts to accomplish emission control or process modification.

154 MONTH DAY YEAR 01

Date of initiation of on-site construction or installation of emission control equipment or process change.

154 MONTH DAY YEAR 02

PPG OCCUPATIONAL HEALTH POLICY MANUAL
SECTION 10.3
ISSUE DATE APRIL 13, 1973

Date by which on-site construction or installation of emissio.
control equipment or process modification is to be completed.

L54 L59 03
MONTH DAY YEAR

Date by which final compliance is to be achieved.

L54 L59 04
MONTH DAY YEAR

Signature of owner or operator

BB 0002752

A1 51

(DATE)

TO: (NAME OF EMPLOYEE)

FROM: (PLANT DIRECTOR OF EMPLOYEE RELATIONS)

SUBJECT: EMPLOYEE NOTIFICATION OF EXPOSURE IN EXCESS OF AN
OSHA ENVIRONMENTAL STANDARD

You are hereby being advised that recent environmental monitoring of your working environment has shown that you are potentially being exposed to (name the environmental hazard) in excess of the limits set under the Safety and Health Standards of the Occupational Safety and Health Act of 1970.

In order to protect your health, you must utilize the following personal protective equipment:

(LIST)

The following measures are being taken to reduce the environmental exposure within the limits set in the above environmental Standard:

(LIST)

Signed _____

BB 0002754

PPG INDUSTRIES, INC.
CARCINOGEN CONTROL PROGRAM

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1 BB 0002755 1

PPG INDUSTRIES, INC.
CARCINOGEN CONTROL PROGRAM

I. INTRODUCTION

There are chemicals that have either been proved to be carcinogenic in man or have induced cancer in animals under experimental conditions. The purpose of this program is to protect the health of our employees, community, and neighbors from the hazards of contact with chemicals that are known to be carcinogenic.

II. POLICY

Appropriate measures will be taken to prevent the introduction of and, where already present, effect the elimination or control of all carcinogenic chemicals. No exposure of persons to carcinogenic chemicals shall be permitted by the respiratory, skin, or oral routes. Whenever and wherever the materials listed in the OSHA Emergency Temporary Standard on Certain Carcinogens are being used within the facilities of the corporation, a compliance program will be in force to assure compliance with this OSHA Standard and this Carcinogen Control Program.

III. RESPONSIBILITIES

The Vice President of Manufacturing of the Division has the responsibility for implementing the Carcinogen Control Program. The Divisional Director or Manager of Environmental Control is responsible to the Vice President to direct all Division activities pertaining to carcinogen control consistent with the protection of health, OSHA Standards, and policy and standards set by the Company and Division. The Company Medical Director will provide consultation to General Office and Facilities' Personnel responsible for the Carcinogen Control Program. The Facility's Manager has the responsibility for implementing the Carcinogen Control Program in the Facility. Other staff responsibilities required to implement the program are set forth below.

IV. OSHA-EMERGENCY TEMPORARY STANDARD ON CERTAIN CARCINOGENS

1. INTRODUCTION

A recent survey of company facilities indicated that some of the chemicals listed in this Standard in Paragraph (b)(1), were present in other than chemical laboratory quantities.

2. PARAGRAPH 1910.93c CARCINOGENS

The following is a reproduction of the entire Standard which is followed by comments and/or recommendations concerning PPG implementation on specific paragraphs of the Standard.

1 BB 0002756 1

STANDARD

Title 29—Labor

CHAPTER XVII—OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, DEPARTMENT OF LABOR

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Emergency Temporary Standard on Certain Carcinogens

Pursuant to section 6(c) of the Williams-Steiger Occupational Safety and Health Act of 1970 (29 U.S.C. 655) and Secretary of Labor's Order No. 12-71 (36 FR 8754), part 1910 of title 29, Code of Federal Regulations, is hereby amended in the manner set forth below, in order to provide an emergency temporary standard dealing with the exposure of employees to certain listed substances that are known to cause cancer.

Concern for the dangers inherent in the occupational exposure to carcinogenic substances was one of the reasons for enactment of the act. See Senate Report No. 91-1282, 91st Congress, 2d session, 2 (1970).

Administrative attention was addressed to the problem about a year ago. On May 22, 1972, the Deputy Assistant Secretary of Labor for Occupational Safety and Health requested information from the Director of the National Institute for Occupational Safety and Health (NIOSH) on nine substances alleged to be carcinogens. As part of his effort to gain the best available scientific data, the Director published on July 6, 1972, at 37 FR 13285, a request for information concerning 15 substances. The data, arguments, and conclusions received by NIOSH were made available to the Occupational Safety and Health Administration.

The Office of Standards continued its work on carcinogens in preparation for making recommendations for a standard under section 6 of the act.

On January 4, 1973, a petition for an emergency temporary standard, submitted by the Oil, Chemical, and Atomic Workers Union and Health Research Group, was received and acknowledged by the Department of Labor. The petition contained relevant information on the danger of exposure to 10 of the carcinogens listed in the standard.

On February 9, 1973, the Assistant Secretary of Labor published in the FEDERAL REGISTER (38 FR 4037), a notice of the receipt of the petition for issuance of an emergency temporary standard, and a request for information from interested persons on the issues involved.

In response to the notice, more than 50 written comments were received, providing valuable additional information, data, and materials concerning carcinogens.

On the basis of all the relevant information before us, it is hereby found that: (1) The 14 carcinogens listed in the emergency temporary standard are toxic and physically harmful; (2) that exposure to any of the 14 substances poses a grave danger to employees; (3) that employees are presently being exposed to the substances; and (4) that the

emergency temporary standard set forth below is necessary to protect the employees from such exposure.

Pursuant to section 6(c) of the act, a proceeding will commence shortly in accordance with section 6(b) of the act, in which the emergency temporary standard will serve as a proposed rule, together with other subsidiary rules. As soon as possible, a draft environmental impact statement will be filed with the Council on Environmental Quality, and copies will be sent to other appropriate Federal agencies for their comments. In addition, a copy of the proposed rules to be noticed under section 6(b) will be sent to the Environmental Protection Agency for its comments under section 309 of the Clean Air Act.

Part 1910 is amended by adding a new § 1910.93c to read as follows:

§ 1910.93c Carcinogens.

(a) *Scope and application.*—This section applies to any activity in which a carcinogen is manufactured, processed, used, repackaged, released, handled, or otherwise present in any manner.

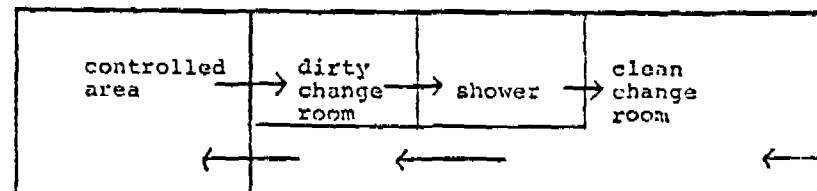
(b) *Definitions.*—(1) "Carcinogen" means any of the substances listed below, or compositions containing such substances, but does not include compositions containing less than 1 percent by weight of the listed carcinogens:

Compound No.	Chemicals	Chemical abstracts registry No.
1.	2-Acetylaminofluorene.	52963
2.	4-Aminodiphenyl.	92671
3.	Benzidine (and its salts)	92875
4.	3,3'-Dichlorobenzidine (and its salts)	91911
5.	1-Dimethylaminoazobenzene.	60117
6.	alpha-Naphthylamine.	13437
7.	beta-Naphthylamine.	91898
8.	4-Nitrodiphenyl.	92843
9.	N-Nitrosodimethylamine.	6279
10.	beta-Propiolactone.	57478
11.	bis-Chloromethyl ether.	51361
12.	Methyl Chloromethyl ether.	107302
13.	4,4'-Methylene(bis)-2-chloroaniline.	101114
14.	Ethyleneimine.	151864

(2) "Controlled area" means an area to which access is restricted and controlled by the employer.

(3) "Decontamination" means the removal or chemical neutralization of a carcinogen to a form that is either non-toxic or not capable of easy absorption into the body.

(4) "Present" includes manufactured, processed, used, repackaged, released, handled, or otherwise present.



(2) A controlled area may also be connected with an uncontrolled area by means of emergency exits which may only be used in case of emergency, such as fire.

(c) (1) *Controlled areas.*—(i) Any area in which any carcinogen is present shall be deemed a controlled area.

(ii) An area shall not be deemed a controlled area if the presence of a carcinogen results only from a transshipment in sealed packages.

(2) *Open-process vessels and open containers.*—Open-process vessels and open containers of a carcinogen shall be permitted only at container filling points and at points where contents of containers are charged into process vessels, and only to the extent necessary to permit transfer of contents. Such transfers shall be under continuous local exhaust ventilation which shall prevent the dispersion of the carcinogen into any work area. The transfer facilities shall have provision to confine any spills to the area served by the ventilation system.

(3) *Toilet facilities and drinking fountains.*—No toilet facilities and no drinking fountains shall be used inside a controlled area.

(4) *Food and beverage.*—No food or beverage shall be permitted within a controlled area.

(5) *Smoking.*—No smoking or smoking materials shall be allowed within a controlled area.

(d) (1) *Access to controlled areas.*—Except as provided in subparagraph (2) of this paragraph, any controlled area may be connected with an uncontrolled area only by means of change rooms and shower rooms so arranged that an employee, in order to enter or leave the controlled area, must go through the following procedures:

(i) In order to enter, an employee must undress completely in a clean change room outside the controlled area, and put on clean protective clothing and equipment; he may enter the controlled area through an entrance designed to prevent the escape of carcinogens from the controlled area to the change room;

(ii) In order to leave a controlled area, an employee must enter a separate dirty change room where he must undress completely and leave every item of clothing and equipment, then he must shower in an adjacent room which he may enter through an entrance designed to prevent the escape of carcinogens from the dirty change room to the shower room. Thereafter, he must enter the clean change room where his street clothes are in his locker.

(iii) A physical layout which would conform to this subparagraph is illustrated below:

(3) Appropriate instructions and signs shall be posted to inform employees of the procedures that must be followed in entering and leaving a controlled area.

(4) The clean change room shall have

August 8, 1973

TO: HOLDERS OF PPG OCCUPATIONAL HEALTH POLICY MANUALS

SUBJECT: REVISION OF EMERGENCY TEMPORARY STANDARD ON CERTAIN CARCINOGENS
- PUBLISHED IN THE FEDERAL REGISTER, JULY 27, 1973

Attached is a copy of the subject revision. Please substitute this in Section 10.4, Paragraph IV.2. for the May 3, 1973, Standard, which it replaces. The principal changes made by the revision are that the revised Standard deals more particularly with different work operations, thereby permitting specification of different control measures in the different categories of operations; also, there are changes in the wording of signs and labels.



Lee B. Grant, M.D.
Medical Director

LBG:lc
Attachment

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A1 57

Title 29—Labor

CHAPTER XVII—OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, DEPARTMENT OF LABOR

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Revision of Emergency Temporary Standard on Certain Carcinogens

On May 3, 1973, an emergency temporary standard on certain carcinogens was promulgated under section 6(c) of the Williams-Steiger Occupational Safety and Health Act of 1970 (38 FR 10929). The standard is based on the findings that the substances listed in the standard are harmful, that exposure to any of the substances poses a grave danger, that employees are being exposed to them, and that the emergency temporary standard is necessary to protect the employees from grave danger.

Since the publication of the standard, numerous comments, objections, and recommendations have been received. A whole range of issues has thus been raised. The finding that all the listed substances are harmful to humans has been questioned, as well as the wisdom of regulating on a common basis fourteen substances of varying properties and uses, and the necessity of all the requirements of the standard.

The emergency temporary standard has been reexamined in the light of the new comments and arguments. And it has been determined that certain changes in the standard are necessary to tailor the requirements for different types of workplaces and work operations, and to clarify the standard.

Therefore, pursuant to section 6(c) of the Williams-Steiger Occupational Safety and Health Act of 1970 (84 Stat. 1596; 29 U.S.C. 655) and Secretary of Labor's Order No. 12-71 (36 FR 8754), 29 CFR 1910.93c is revised to read as set forth below.

The principal changes made by the revision are:

(1) The standard as revised deals more particularly with different work operations, such as isolated environment operations, closed system operations, and open vessel operations;

(2) The particularization of the standard has permitted the specification of different control measures necessary to protect employees engaged in the different categories of operations. Compare paragraph (c)(1) with paragraph (c)(2); and,

(3) The legend on the warning sign and label is changed to apprise employees more accurately of the hazards to which they are exposed. The original findings concerning the toxicity of all the fourteen substances listed in the standard, the grave danger resulting from exposure to any of them, and the exposure of employees to them, are reconfirmed. And the standard as revised is considered necessary and sufficient to protect employees from the grave danger from exposure to any of the substances.

§ 1910.93c Carcinogens.

(a) *Scope and application.* This section applies to any workplace in which a carcinogen is manufactured, processed, used, repackaged, released, handled or stored, but shall not apply to any workplace involving transshipment of carcinogens in sealed containers.

(b) *Definitions.* (1) "Carcinogen" means any of the substances listed below, or any mixture containing 1 percent or more of such substances, by weight.

Compound No.	Chemicals	Chemical abstract registry No.
1.....	2-Acetylaminofluorene.....	53963
2.....	4-Aminodiphenyl.....	92671
3.....	Benidine (and its salts).....	92875
4.....	3,3'-Dichlorobenzidine (and its salts).....	91941
5.....	Dimethylaminoazobenzene.....	60117
6.....	alpha-Naphthylamine.....	134327
7.....	beta-Naphthylamine.....	91546
8.....	4-Nitrophenyl.....	92933
9.....	N-Nitrosodimethylamine.....	62750
10.....	beta-Propiolactone.....	57578
11.....	bis-Chloromethyl ether.....	54281
12.....	Methyl Chloromethyl ether.....	107302
13.....	4,4'-Methylenebis(2-chloroaniline).....	101144
14.....	Ethyleneimine.....	161564

(2) "Controlled area" means an area to which access or egress by employees is required to be restricted and controlled by the employer under this section.

(3) "Decontamination" means the removal or inactivation of a carcinogen.

(4) "Isolated environment" means a fully enclosed structure, which is impervious to the passage of a carcinogen, which is not the vessel of containment of the carcinogen, and which prevents the dispersion of a carcinogen into areas or atmospheres where employees would be exposed to contact with that carcinogen, even if leakage or spillage from the vessel of containment occurs.

(5) "Closed system" means an operation or equipment involving a carcinogen where the containment precludes, under normal conditions, the exposure by any route of employees to a carcinogen.

(6) "Laboratory type hood" means a device enclosed on three sides, and the top and bottom, ventilated to withdraw air inward and away from the open side, designed and constructed in such a way that an operation involving a carcinogen within the hood does not require the insertion of any portion of any employee's body other than his hands and arms.

(c) *Requirements for areas containing carcinogens.* A controlled area shall be established by the employer where a carcinogen is manufactured, processed, used, repackaged, released, handled or stored. All such areas shall be controlled in accordance with the requirements for the following category or categories describing the operation involved:

(1) *Isolated environment operations.* Where a carcinogen is contained within an isolated environment, such as a "glove box," employees working with such environments shall, upon each exit from

the area, be required to wash their hands and arms at the point of exit from the area containing the isolated environment.

(2) *Closed system operations.* Where a carcinogen is stored in sealed containers, or contained in a closed system, such as fully enclosed process or transfer equipment, including pipes, and sample ports or openings are not used while a carcinogen is contained within:

(i) Access to the controlled area shall be restricted to only employees who work in that area.

(ii) Upon entering the controlled area at the first entry of the work day employees shall be provided with and be required to put on and wear clean work clothing, such as smocks, coveralls, or long-sleeved shirt and long pants.

(iii) Such employees shall be required to remove and leave that clothing at the point of exit upon each exit from that area.

(iv) Such employees shall be required to wash hands and face upon each exit from that area, not necessarily at the point of exit, but in the establishment.

(v) Such employees shall be required to shower after last daily exit from that area, not necessarily at the point of exit, but in the establishment.

(3) *Closed system transfer or charging or discharging point operations.* In operations involving "laboratory type hoods," or in locations where a carcinogen is contained in an otherwise "closed system," but is transferred, charged, or discharged into other normally closed containers with venting to the atmosphere:

(i) Access to the controlled area shall be restricted to only employees who work in that area.

(ii) Continuous local exhaust ventilation shall be maintained to prevent the dispersion of the carcinogen to areas where employees could, without such ventilation, be exposed to the carcinogen.

(iii) Upon entering the controlled area at the first entry of the work day all employees shall be provided with and be required to put on and wear clean work clothing, such as smocks, coveralls or long-sleeved shirts and long pants.

(iv) Employees in the controlled area involved in carcinogen handling operations shall be provided with and be required to wear personal protective equipment adequate to prevent exposure to a carcinogen.

(v) Such employees shall be required to remove and leave that clothing at the point of exit upon each exit from that area.

(vi) Such employees shall be required to wash hands and face upon each exit from that area, not necessarily at the point of exit, but in the establishment.

(vii) Such employees shall be required to shower after last daily exit from that area, not necessarily at the point of exit.

(viii) Employees in the controlled area shall be required to remove and leave all protective equipment at the hood site or charging, discharging or transfer point after work at that site or point.

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RULES AND REGULATIONS

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(4) *Open vessel operations.* Where a carcinogen is contained in a vessel open to the work environment:

(i) Access to the controlled area shall be restricted only to employees who work in the area.

(ii) Continuous local exhaust ventilation shall be maintained at such operation locations sufficient to prevent the dispersion of the carcinogen to areas where employees could, without such ventilation, be exposed to contact with the carcinogen.

(iii) Clean work clothing shall be provided to employees whenever they enter such a controlled area and shall be required to be worn by employees working in the controlled area. Such garments shall include footwear, socks, underwear, outerwear, and head covering.

(iv) Employees working in the controlled area shall be provided with and be required to wear personal protective equipment adequate to prevent exposure to a carcinogen.

(v) Employees working in the controlled area shall be required to remove and leave all work clothing and protective equipment at the point of exit from the controlled area, and shall shower at that point, upon each exit from the controlled area.

(vi) Toilet and drinking facilities may not be used in the controlled area.

(5) *Other Operations.* In operations involving the decontamination of surfaces containing a carcinogen, either as a part of cleanup of leaks or spills, maintenance or repair operations on systems or equipment, or any operation involving work in an area where direct contact with a carcinogen could result without protection, each employee entering an affected area where operations of that type are being performed shall:

(i) Be provided with a clean, full, impervious, pressurized, air-supplied suit;

(ii) Be required to put on the suit before entering the affected area and engaging in such operation;

(iii) Be required to wear the suit in such an area and during the operation;

(iv) Be decontaminated before leaving the area and before removing the suit; and

(v) Be required to shower after removing such suit.

(6) *"Out-of-doors operations."* In an operation described in paragraphs (c) (1) through (5) of this section that is out-of-doors, rather than being confined in an enclosed structure, general mechanical ventilation is not required.

(d) *General controlled area requirements.* In addition to the controlled area requirements for types of operations listed in paragraph (c) of this section the following requirements apply to all controlled areas.

(1) Each employer shall establish and maintain a list of employees entering a controlled area. The list shall be made available on request to authorized representatives of the Secretary of Labor.

(2) The employer shall provide all work clothing, protective clothing, equip-

ment and wash and shower supplies, including towels, required by this section.

(3) Any required shower rooms shall be provided in accordance with § 1910.141. Shower supplies may be introduced into a shower room only through a noncontaminated area.

(4) No food or beverage shall be permitted within a controlled area.

(5) No smoking or smoking materials or tobacco products shall be allowed within a controlled area.

(6) Appropriate instructions and signs shall be posted to inform employees of the procedures that must be followed in entering and leaving a controlled area.

(7) Any equipment, material, or any other items that are to be taken into or removed from a controlled area shall be taken in or removed from such area in a manner which does not contaminate any employees outside the controlled area.

(8) When only removal of outer clothing or personal protective equipment is required under paragraph (c) of this section at point of exit from a controlled area, an employee must be able, upon exit from the controlled area, to enter the change room, remove outer work garments and equipment and leave them in that room.

(9) When change and shower facilities are required under paragraph (c) of this section at point of exit from a controlled area, they shall be arranged so that upon exit, an employee must be able to enter a separate dirty change room where he can undress completely and leave every item of clothing and equipment. He must then be able to shower in an adjacent room which he can enter through an entrance designed to prevent the escape of carcinogens from the dirty change room to the shower room. Thereafter, he must be able to enter a clean change room where his street clothes are in his locker.

(10) When work area garments or protective clothing and equipment are required under paragraph (c) of this section to be worn in a controlled area, a clean change room must be provided so that before entering the controlled area the employee can change into clean work area garments or protective clothing and equipment in an area not containing contaminated or used work clothing or equipment and without passing through such a contaminated area to enter the controlled area. The clean change room shall have individual storage facilities for storage of street clothes and clean protective clothing and equipment.

(11) Continuous general mechanical exhaust ventilation shall be provided in controlled areas, or other positive means provided, so that air from the controlled area does not flow to non-controlled areas. Local exhaust ventilation may satisfy this requirement. Clean makeup air shall replace air removed.

(e) *Signs and labels.* (1) Entrances to controlled areas shall be posted with legible signs bearing the legend:

CANCER-SUSPECT AGENT

In this area

This agent may be hazardous to your health

AUTHORIZED PERSONNEL ONLY

For isolated environment operations, the sign shall be posted on or near the isolated environment structure.

(2) Equipment, material, and clothing contaminated with a carcinogen shall not be removed from a controlled area, unless it is either decontaminated or sealed in impervious containers bearing the legend:

DANGER

Contaminated with

CANCER-SUSPECT AGENT

This agent may be hazardous to your health

(3) Entrances to every controlled area for operations described in paragraph (c) (5) of this section shall be posted with legible signs bearing the legend:

CANCER-SUSPECT AGENT

EXPOSED IN THIS AREA

This agent may be hazardous to your health

FULL IMPERVIOUS PRESSURIZED AIR-SUPPLIED SUIT REQUIRED AT ALL TIMES

AUTHORIZED PERSONNEL ONLY

(f) *Cleaning.* Controlled areas involving open vessel operations or other operations, as described in paragraph (c) (4) and (5) of this section, shall be cleaned thoroughly not less than once each working day. Employees engaged in the cleaning shall be provided, and shall be required to wear, personal protective equipment adequate to prevent exposure to a carcinogen. Such employees shall be required to wash down carefully before removing protective equipment, and then shower.

(g) *Decontamination.* Decontamination processes shall be established and implemented to remove carcinogens on surfaces of equipment, materials, and the decontamination facility, that are known to be contaminated with a carcinogen.

(h) *Waste disposal.* Waste disposal methods and processes shall be established and implemented which do not permit carcinogens to be introduced into noncontrolled areas.

(i) *Medical surveillance programs.* Each employer subject to this section shall report in writing to the Occupational Safety and Health Administration, Office of Standards, Room 504, 400 First Street, NW., Washington, D.C. 20210, information as to any kind of medical surveillance program that has been voluntarily instituted by the employer.

(j) *Monitoring.* All employers subject to this section shall report in writing to the same office information as to the type of monitoring system that has been instituted.

(k) *Reporting.* Every employer subject to this section shall report in writing to the Occupational Safety and Health Administration, Office of Standards, the following information:

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(1) The address of each of his controlled areas;

(2) The name and other identifying information as to the particular carcinogens present in each of his controlled areas;

(3) The approximate number of employees entering each of his controlled areas during a representative week of normal operations in the controlled area; and

(4) The manner in which the carcinogens are present in each of his controlled areas, e.g., whether a carcinogen is manufactured, processed, used, repackaged, released, or otherwise handled.

Effective date. This section shall become effective on July 30, 1973.

(Sec. 6, Public Law 91-596, 84 Stat. 1593 (29 U.S.C. 655), Secretary's Order No. 12-71 (36 FR 8754))

Signed at Washington, D.C., this 24th day of July 1973.

JOHN STENDER,
Assistant Secretary of Labor.

[FR Doc. 73-15510 Filed 7-26-73; 8:45 am]

[BB 0002761]

AI 60

PPG INDUSTRIES, INC.
POLICY ON REQUESTS FOR HEALTH HAZARD EVALUATIONS
UNDER O.S.H.A.

I. INTRODUCTION

The Code of Federal Regulations, Title 42, Part 85, Requests for Health Hazard Evaluations, was published November 6, 1972, and a copy is attached. The provisions of this Part 85 are applicable to requests submitted by any employer or authorized representative of employees pursuant to Section 20(a)(6) of the Occupational Safety and Health Act of 1970, for a determination of potentially toxic effects of any substance normally used or found in any place of employment to which the Act is applicable.

Since the effective date of the Act, PPG has initiated no such requests and only a few have been initiated by our employees. The industrial hygiene and occupational medical staff of PPG can provide the expertise which will eliminate the necessity of company-initiated requests. It is hoped that proper indoctrination of employees who may be exposed to an in-plant environmental health hazard should also preclude the necessity of our employees initiating such requests.

II. POLICY

No employee shall be permitted to work where he may be exposed to a recognized environmental health hazard without being thoroughly indoctrinated by medical, safety, and/or industrial hygiene personnel as to the nature of the hazard, control measures being employed, and what is required of him to protect his health. Such indoctrination shall be repeated at least annually.

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Any request for health hazard evaluation known to have been submitted by an employee or employee group under Part 85 will be brought to the immediate attention of the appropriate Divisional Director of Environmental Control. Whenever in his judgment it would be desirable and is possible, he will arrange to perform environmental surveys concurrently with those being done by NIOSH. The Plant Manager will be responsible for advising NIOSH of information or photographs which would compromise trade secrets.

REQUESTS FOR HEALTH HAZARD EVALUATIONS

(Code of Federal Regulations, Title 42, Part 85)

Title 42—PUBLIC HEALTH

Chapter I—Public Health Service, Department of Health, Education, and Welfare

SUBCHAPTER G—OCCUPATIONAL SAFETY AND HEALTH RESEARCH AND RELATED ACTIVITIES

PART 85—REQUESTS FOR HEALTH HAZARD EVALUATIONS

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85.12 Subsequent requests for health hazard evaluations.

AUTHORITY: The provisions of this Part 85 issued under the authority of section 8(g), 84 Stat. 1600; 29 U.S.C. 657(g).

§ 85.1 Applicability.

The provisions of this Part 85 are applicable to requests submitted by any employer or authorized representative of employees pursuant to section 20(a)(6) of the Occupational Safety and Health Act of 1970 for a determination of potentially toxic effects of any substance normally used or found in any place of employment to which the Act is applicable. This Part 85 is not intended to preclude the use of other channels of communication with the National Institute for Occupational Safety and Health to obtain information and technical assistance related to toxic substances.

§ 85.2 Definitions.

Any term defined in the Occupational Safety and Health Act of 1970 and not defined below shall have the meaning given it in the Act. As used in this part:

(a) "Act" means the Occupational Safety and Health Act of 1970 (29 U.S.C. 651, et seq.).

(b) "Authorized representative of employees" means any person or organization meeting the conditions specified in § 85.3(b)(4) (i), (ii), or (iii).

(c) "Investigation" includes a physical inspection of the place of employment pursuant to section 8 of the Act and means such inspection, sampling, observations, and other measurements reasonably necessary to determine

whether any substance found in the place of employment for which the request is made has potentially toxic effects in such concentrations as used or found.

(d) "Health hazard evaluation" means the investigation and the determination of potentially toxic effects of any substance normally used or found in any place of employment to which the Act is applicable.

(e) "Place of employment" means any factory, plant, establishment, construction site, or other area, workplace, or environment where work is performed by any employee of an employer.

(f) "NIOSH" means the National Institute for Occupational Safety and Health.

(g) "NIOSH officer" means a person authorized by NIOSH to conduct investigations.

(h) "Substance" means any chemical or biological agent which has the potential to produce toxic effects.

(i) "Toxic effects" are those which result in short- or long-term disease, bodily injury, affect health adversely, or endanger the life of man.

§ 85.3 Procedures for requesting health hazard evaluations.

(a) A request for a health hazard evaluation should be addressed to the National Institute for Occupational Safety and Health, Hazard Evaluation Services Branch, U.S. Department of Health, Education, and Welfare, Cincinnati, Ohio 45202.

(b) A request for such an evaluation shall:

(1) Be in writing and signed by (i) the employer in whose place of employment the substance is normally found, or (ii) by an authorized representative of employees who are employed by such employer;

(2) State the requester's name, address, and telephone number, if any; the address of the place of employment where the substance is normally found; the specific workplace or workplaces involved, and the specific process or type of work which is the source of the substance or in which such substance is used;

(3) Specify with reasonable particularity the nature of the conditions, circumstances, or other grounds on which the request is made;

(4) State, where the requester is other than the employer:

(i) That he is an authorized representative, or an officer, of the organization representing the employees for purposes of collective bargaining; or

(ii) That he is an employee of the employer and is authorized by two or more

employees employed in the workplace where the substance is normally found to represent them for purposes of the Act. Each such authorization shall be in writing and included in the request; or

(iii) That he is one of three or less employees employed in the workplace where the substance is normally found.

(5) Indicate whether the requester or those persons who have authorized the requester to represent them desire that NIOSH not reveal their names to the employer.

(c) The request shall, if the information is known to the requester:

(1) Identify the potentially toxic substance or substances involved;

(2) State the trade name, chemical name, and the manufacturer of each such substance;

(3) State whether the substance or the container of such substance has a warning label; and

(4) Specify the physical form of the substance, number of people exposed, length of exposure (hours/day), and occupations of exposed employees.

NOTE: The National Institute for Occupational Safety and Health has developed a form, entitled "Request for Health Hazard Evaluation," to assist persons in requesting evaluations under this part. Forms are available upon request from NIOSH, Hazard Evaluation Services Branch, Cincinnati, Ohio 45202, or from the NIOSH representative in any Regional Office of the Department of Health, Education, and Welfare.

§ 85.4 Acting on requests.

(a) When a request meeting the requirements of this part has been submitted in accordance therewith and designated employees of NIOSH have concluded that there is reasonable cause to believe that an investigation is warranted, a NIOSH officer will inspect the place of employment, collect samples where appropriate and perform such tests as necessary, including medical examinations of employees, to the conduct of a health hazard evaluation.

(b) If there is no reasonable cause to conclude that an investigation is warranted, the requester shall be notified in writing of such decision.

(c) Investigations shall be conducted in accordance with the requirements of this part.

§ 85.5 Authority for investigations.

(a) Employees of the National Institute for Occupational Safety and Health who have been issued the NIOSH official credentials (consisting of HSM Form 599-2 entitled "Identification Record") are authorized by the Director, NIOSH, for the purposes of section 20(a)(6) of the Act and pursuant to section 8, to

enter without delay and at reasonable times any place of employment for which a request has been submitted, to inspect and investigate during regular working hours and at other reasonable times, and within reasonable limits and in a reasonable manner, any such place of employment, and all pertinent conditions, structures, machines, apparatus, devices, equipment, and materials therein as may be directly related to the determination whether any substance normally found in the place of employment for which a request has been submitted has potentially toxic effects in such concentrations as used or found. In connection with any such investigation, such NIOSH employees may question privately any employer, owner, operator, agent, or employee and review records required by the Act and regulations, and other related records.

(b) Areas containing information which is classified by any agency of the U.S. Government in the interest of national security will be inspected only by NIOSH employees who have obtained the appropriate security clearance.

§ 85.6 Advance notice of visits.

(a) Advance notice of visits to the place of employment may be given to expedite a thorough and effective investigation. Advance notice will not be given when, in the judgment of the NIOSH officer, giving such notice would adversely affect the validity and effectiveness of the investigation.

(b) Where a request in accordance with this part has been made by an authorized representative of employees, advance notice in accordance with paragraph (a)

this section will be given by NIOSH to the requester, the representative of the employees for purposes of collective bargaining if such representative is other than the requester, and to the employer.

(c) Where a request in accordance with this part has been made by any employer, advance notice will be given by NIOSH to the employer. Upon the request of the employer, NIOSH will inform the authorized representative of employees of the visit: *Provided*, The employer furnishes NIOSH in writing with the identity of such representative and with such information as is necessary to enable NIOSH promptly to inform such representative of the visit.

§ 85.7 Conduct of investigations.

(a) Prior to beginning an investigation, NIOSH officers shall present their credentials to the owner, operator, or agent in charge at the place of employment, explain the nature, purpose, and scope of the investigation and the records specified in § 85.5 which they wish to review. Where the investigation is the result of a request submitted by an authorized representative of employees, a copy of the request shall be provided to the employer, except where the requester or any person authorizing the requester pursuant to § 85.3(b)(4)(ii) has indicated that NIOSH not reveal his name to the employer, in which case, a summary of the basis for the request shall be provided to the employer.

(b) At the commencement of an investigation, the employer should precisely identify information which can be obtained in the workplace or workplaces to be inspected as trade secrets. If the NIOSH officer has no clear reason to question such identification, such information shall not be disclosed except in accordance with the provisions of section 20(a)(6) and section 15 of the Act. However, if NIOSH at any time questions such identification by an employer, not less than 15 days' notice to an employer shall be given of the intention to remove the trade secret designation from such information. The employer may within that period submit a request to the Director, NIOSH, to reconsider this intention and may provide additional information in support of the trade secret designation. The Director, NIOSH, shall notify the employer in writing of the decision which will become effective no sooner than 15 days after the date of such notice.

(c) NIOSH officers are authorized to collect environmental samples and samples of substances, to take or obtain photographs related to the purpose of the investigation, employ other reasonable investigative techniques, including medical examinations of employees with the consent of such employees, and to question privately any employer, owner, operator, agent, or employee. The employer shall have the opportunity to review photographs taken or obtained for the purpose of identifying those which contain or might reveal a trade secret.

(d) NIOSH officers shall comply with all safety and health rules and practices at the place of employment being investigated, and they shall provide and use appropriate protective clothing and equipment. In situations requiring specialized or unique types of protective equipment, such equipment shall be furnished by the employer.

(e) The conduct of investigations shall be such as to preclude unreasonable disruption of the operations of the employer's establishment.

§ 85.8 Provision of suitable space for employee interviews and examinations; identification of employees.

An employer shall, on request of the NIOSH officer, provide suitable space, if such space is reasonably available, to NIOSH to conduct private interviews with, and examinations of, employees. NIOSH officers shall consult with the employer as to the time and place of the medical examination and shall schedule such examinations so as to avoid undue disruption of the operations of the employer's establishment. NIOSH shall conduct, and assume the medical costs of, examinations conducted under this part.

§ 85.9 Representatives of employers and employees; employee requests.

(a) NIOSH officers shall be in charge of investigations. Where the request for a health hazard evaluation has been made by an authorized representative of employees, a representative of the employer and a representative authorized by his employees who is an employee of the employer shall be given an oppor-

tunity to accompany the NIOSH officer during the initial physical inspection of any workplace for the purpose of aiding the investigation by identifying the suspected hazard. The NIOSH officer may permit additional employer representatives and such additional representatives authorized by employees to accompany him where he determines that such additional representatives will further aid the investigation. However, if in the judgment of the NIOSH officer, good cause has been shown why accompaniment by a third party who is not an employee of the employer is reasonably necessary to the conduct of an effective and thorough investigation of the workplace, such third party may accompany the NIOSH officer during the inspection: *Provided, however*, That access by such persons to areas described in paragraph (d) of this section shall be in accordance with the requirements of such provision, and access to areas described in paragraph (e) of this section shall be with the consent of the employer. A different employer and employee representative may accompany the officer during each different phase of an inspection if this will not interfere with the conduct of the investigation.

(b) NIOSH officers are authorized to resolve all disputes as to who is the representative authorized by the employer and employees for the purpose of this section. If there is no authorized representative of employees, or if the NIOSH officer is unable to determine with reasonable certainty who is such representative, he shall consult with a reasonable number of employees concerning matters directly related to the health hazard evaluation.

(c) NIOSH officers are authorized to deny the right of accompaniment under this section to any person whose conduct interferes with a fair and orderly physical inspection.

(d) With regard to information classified by an agency of the U.S. Government in the interest of national security, only persons authorized to have access to such information may accompany an officer in areas containing such information.

(e) Upon request of an employer, any representative authorized under this § 85.9 by employees in any area containing trade secrets shall be an employee in that area or an employee authorized by the employer to enter that area.

§ 85.10 Imminent dangers.

Whenever, during the course of, or as a result of, an investigation under this part the NIOSH officer believes that there is a reasonable basis for an allegation of an imminent danger, NIOSH will immediately advise the employer and those employees who appear to be in immediate danger of such allegation and will inform appropriate representatives of the Department of Labor or the State agency designated under section 18(b) of the Act.

§ 85.11 Notification of determination to employers, affected employees and Department of Labor.

(a) A determination made pursuant to section 20(a)(6) of the Act will, as a minimum: (1) Identify and set forth, where appropriate, the concentrations of the substance(s) found in the place of employment and the conditions of use and (2) state whether such substance(s) has potentially toxic effects in such concentrations, as well as the basis for such judgments.

(b) Copies of the determination will be mailed to the employer and to the authorized representatives of employees.

(c) Except as hereinafter provided, the employer shall post a copy of the determination for a period of 30 calendar days at or near the workplace(s) of affected employees. The employer shall take steps to insure that the posted determinations are not altered, defaced, or covered by other material during such period. The employer will not be required to post the

determination if the employer requests that copies of the determination be mailed to affected employees and furnishes NIOSH with a list of the names and mailing addresses of the employees employed in the workplace(s) designated by the NIOSH Officer. In the latter event, NIOSH will mail such copies to affected employees at the mailing addresses provided by the employer.

(d) For purposes of this section, the term "affected employees" means those employees determined by NIOSH to be exposed to the substance(s) which is the subject of the health hazard evaluation.

(e) Copies of all determinations will be forwarded to the Department of Labor and the appropriate State agency designated under section 18(b) of the Act. If the Secretary of Health, Education, and Welfare determines that any substance is potentially toxic at the concentrations in which it is used or found in a place of employment, and such substance is not covered by an occupational safety or

health standard promulgated under section 6 of the Act, the Secretary of Health, Education, and Welfare will immediately submit such determination to the Secretary of Labor together with all pertinent criteria.

§ 85.12 Subsequent requests for health hazard evaluations.

Where a request is received for a health hazard evaluation in a place of employment in which an evaluation under this part previously has been made, the Secretary may make a subsequent investigation if, as a result of the passage of time or additional information, he deems such a subsequent investigation consistent with the purpose of the Act.

[FR Doc.72-19042 Filed 11-6-72;8:51 am]

[37 FR 23639]

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

REQUEST FOR HEALTH HAZARD EVALUATION

This form is provided to assist in registering a request for a health hazard evaluation with the U.S. Department of Health, Education, and Welfare as provided in Section 20(a)(6) of the Occupational Safety and Health Act of 1970 and 42 CFR Part 85. (See Statement of Authority on Reverse Side).

Name of Establishment Where Alleged Hazard(s) Exist _____

Company { Street _____ Telephone _____
Address { City _____ State _____ Zip Code _____

1. Principal Company Activity _____
(manufacturing, construction, transportation, services, etc.)

2. Specify the particular building or worksite where the alleged hazard is located, including address _____

3. Specify the name and phone number of employer's agent(s) in charge. _____

4. Describe briefly the hazard(s) which exists by completing the following information:

Identification of Hazard or Toxic Substance(s) _____

Trade Name (If Applicable) _____ Chemical Name _____

Manufacturer _____ Does the material have a warning label? _____ Yes _____ No

If Yes, attach copy of label or a copy of the information contained on the label.

Physical Form: Dust ☐ Gas ☐ Liquid ☐ Mist ☐ Other ☐

Type of Exposure? Breathing ☐ Swallowing ☐ Skin Contact ☐

Number of People Exposed _____ Length of Exposure (Hours/Day) _____

Occupations of Exposed Employees _____

5. Using the space below describe further the nature of the conditions or circumstances which prompted this request and other relevant aspects which you may consider important, such as the nature of the illness or symptoms of exposure, the concern for the potentially toxic effects of a new chemical substance introduced into the workplace, etc.

6. (a) To your knowledge has this hazard been considered previously by any Government agency? _____
(b) If so, give the name and address of each.

_____ (c) and, the approximate date it was so considered.

7. (a) Is this request, or a request alleging a similar hazard, being filed with any other Government agency? _____ (b) If so, give the name and address of each.

The undersigned (check one)

- ☐ Employer
☐ Authorized Representative of employees*

i ii iii (circle one)

believes that a substance (or substances) normally found at the following place of employment may have potentially toxic effects in the concentration used or found.

Signature _____ Date _____
Typed or Printed Name _____ Telephone: Home - _____
Address { Street _____ Business - _____
City _____ State _____ Zip Code _____

If you are a representative of employees, state the name and address of your organization.

Please indicate your desire:

- ☐ I do not want my name revealed to the employer.
☐ My name may be revealed to the employer.

Authority:

Section 20(a)(6) of the Occupational Safety and Health Act, (29 U. S. C. 669(a)(6)) provides as follows: The Secretary of Health, Education, and Welfare shall . . . determine following a written request by any employer or authorized representative of employees, specifying with reasonable particularity the grounds on which the request is made, whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found, and shall submit such determination both to employers and affected employees as soon as possible. If the Secretary of Health, Education, and Welfare determines that any substance is potentially toxic at the concentrations in which it is used or found in a place of employment, and such substance is not covered by an occupational safety or health standard promulgated under section 6, the Secretary of Health, Education, and Welfare shall immediately submit such determination to the Secretary of Labor, together with all pertinent criteria.

- * "Authorized representative of employees" means any person or organization meeting the conditions specified in 42 CFR Part 85.3 (b) (4) (i), (ii) or (iii):

- (i) - that he is an authorized representative of, or an officer of the organization representing, the employees for purposes of collective bargaining; or
(ii) - that he is an employee of the employer and is authorized by two or more employees employed in the workplace where the substance is normally found, to represent them for purposes of the Act. Each such authorization shall be in writing and included in the request; or
(iii) - that he is one of three or less employees employed in the workplace where the substance is normally found.

Send the completed form to:

National Institute for Occupational Safety and Health
Hazard Evaluation Services Branch
U.S. Department of Health, Education, and Welfare
Cincinnati, Ohio 45202

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CUMULATIVE SUPPLEMENT TO
JULY 1974 EDITION OF
NIOSH CERTIFIED PERSONAL PROTECTIVE EQUIPMENT

SEPTEMBER 1974

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Center for Disease Control
National Institute for Occupational Safety and Health
Morgantown, West Virginia 26505

BB 0002770

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¹This table of contents lists all entries in the July 1974 edition and this supplement. Items marked with an asterisk appear in this supplement.

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PREFACE

This cumulative supplement to the July 1974 publication, NIOSH CERTIFIED PERSONAL PROTECTIVE EQUIPMENT, lists approvals and certifications issued between July 18, 1974 and September 1, 1974.

A new table has been added, describing the pressure range and hose length range for each approved supplied-air respirator.

Comments on this publication, and requests for additional information, should be sent to the Director, Testing and Certification Laboratory, National Institute for Occupational Safety and Health, 944 Chestnut Ridge Road, Morgantown, WV 26505.

II. GAS DETECTOR TUBE UNITS

The following gas detector tube units have been approved by the National Institute for Occupational Safety and Health since July 18, 1974:

B. Gastec Model 400 Aspirating Pump (Bendix PN 2417535) has been certified for use with

8. Trichloroethylene - Model 132H gas detector tube, TC-84-038, August 9, 1974.

D. Kitagawa Model 400 Aspirating Pump has been certified for use with

8. Hydrogen Sulfide - Model 120b gas detector tube, TC-84-037, July 23, 1974.

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III. RESPIRATORY PROTECTIVE DEVICES

The following respiratory protective devices have been approved by the U.S. Department of the Interior, Bureau of Mines and the U.S. Department of Health, Education, and Welfare, National Institute for Occupational Safety and Health, since July 18, 1974.

Self-Contained Breathing Apparatus

18. SurvivAir® part numbers 9038-00, 9038-02, 9838-00, and 9838-02 demand-type one-half hour compressed-air self-contained breathing apparatus. Approval TC-13F-44, issued to SurvivAir Div., U.S. Divers Co., August 30, 1974.

19. SurvivAir® part numbers 9038-20, 9038-22, 9838-20, and 9838-22 pressure demand-type one-half hour compressed-air self-contained breathing apparatus. Approval TC-13F-45, issued to SurvivAir Div., U.S. Divers Co., August 30, 1974.

Supplied-Air Respirators

9. Scott catalog numbers 9616-11, -12, -15, -21, -22, and -25; and 4622-11, -12, -15, -21, -22, and -25 supplied-air respirators with 4266-15, 4265-25, and 4264-50 air-supply hose. Approval TC-19C-71, issued to Scott Aviation, August 20, 1974.

10. Scott catalog numbers 4616-18, -19, -28, and -29; and 4622-18, -19, -28, and -29 supplied-air respirators with 4259-15, 4258-25, and 4257-50 air-supply hose. Approval TC-19C-72, issued to Scott Aviation, August 20, 1974.

Dust, Fume, and Mist Respirators

16. A.O. R1050 single-use respirator for respiratory protection against pneumoconiosis and fibrosis-producing dusts. Approval TC-21C-147, issued to American Optical Corp., August 14, 1974.

17. Safeline 5350 single-use respirator for respiratory protection against pneumoconiosis and fibrosis-producing dusts. Approval TC-21C-148, issued to Safeline Products, August 14, 1974.

18. Scott part numbers 662-1 and 662-2 respirators (with 502-R filter) for respiratory protection against dusts, fumes, and mists having a time-weighted average less than 0.05 mg/M^3 , and radionuclides. Approval TC-21C-149, issued to Scott Aviation, August 20, 1974.

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Chemical-Cartridge Respirators

21. A.O. R5052 respirator (with R52 cartridges) for respiratory protection against not more than 10 parts per million chlorine, 50 parts per million hydrogen chloride, and 50 parts per million sulfur dioxide. Approval TC-23C-60, issued to American Optical Corp., August 14, 1974.

22. A.O. R6052 respirator (with R52 cartridges) for respiratory protection against not more than 10 parts per million chlorine, 50 parts per million hydrogen chloride, and 50 parts per million sulfur dioxide. Approval TC-23C-61, issued to American Optical Corp., August 14, 1974.

23. Safeline 5221 respirator (with 5963 cartridges) for respiratory protection against not more than 10 parts per million chlorine, 50 parts per million hydrogen chloride, and 50 parts per million sulfur dioxide. Approval TC-23C-62, issued to Safeline Products, August 14, 1974.

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TABLES FOR IDENTIFICATION
OF APPROVED COMPONENT PARTS

Table III-1. Self-contained breathing apparatus component parts, by approval number.

Approval number	Approval issued to	Respirator number(s)	Component parts, number(s) and description
TC-13F-44	SurvivAir Div., U.S. Divers Co.	9038-00, 9038-02, 9838-00, 9838-02,	9411-12 or 9413-20, facepiece. 9118-00, regulator. 9602-47, low-pressure warning. 9151-45, cylinder and valve assembly. 9457-00, back-pack assembly.
TC-13F-45	SurvivAir Div., U.S. Divers Co.	9038-20, 9038-22, 9838-20, 9838-22	9411-60 or 9413-60, facepiece. 9118-01, regulator. 9602-47, low-pressure warning. 9151-45, cylinder and valve assembly. 9457-00, back-pack assembly.

Table III-3. Supplied-air respirators component parts, by approval number.

Approval number	Approval issued to	Respirator number(s)	Component parts, number(s) and description
TC-19C-72	Scott Aviation	4616-18, -19, -28, and -29 4622-18, -19, -28, and -29	742 or 4704, facepiece. 6119, breathing tube. 4199 or 4199-1, flow control valve and cartridge assembly. 4225, air-supply hose.
TC-19C-73	Scott Aviation	4616-11, -12, -15, -21, -22, and -25 4622-11, -12, -15, -21, -22, and -25	742 or 4704, facepiece. 6119, breathing tube. 4196 or 4196-1, flow control valve and cartridge assembly. 4286, air-supply hose.

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Table III-4. Dust, fume, and mist respirators component parts, by approval number.

Approval number	Approval issued to	Respirator number(s)	Component parts, number(s) and description
TC-21C-147	American Optical Corp.	R1050	R1050, respirator assembly.
TC-21C-148	Safeline Products	5350	5350, respirator assembly.
TC-21C-149	Scott Aviation	662-1 and 662-2	805 or 742, facepiece. 502-R, filter.

Table III-5. Chemical-cartridge respirators component parts, by approval number.

Approval number	Approval issued to	Respirator number(s)	Component parts, number(s) and description
TC-23C-60	American Optical Corp.	R5052	50206, basic respirator subassembly.
TC-23C-61	American Optical Corp.	R6052	51071, basic respirator subassembly.
TC-23C-62	Safeline Products	5221	05862, basic respirator subassembly. 5963, cartridges.

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PRESSURE RANGES AND HOSE-LENGTH RANGES FOR APPROVED
SUPPLIED-AIR RESPIRATORS

Approval number	Respirator(s)	Hose-length range, feet	Pressure range, psi
TC-19C-64	Cesco PI-800	15	5 - 17
TC-19C-64	U.S. Safety Services PI-80	15	5 - 17
TC-19C-65	SurvivAir ^R 9011-12, 9811-12	4 - 250	50 - 125
TC-19C-66	SurvivAir ^R 9011-14, 9811-14	4 - 250	50 - 125
TC-19C-67	SurvivAir ^R 9011-13, 9811-13	4 - 250	50 - 125
TC-19C-68	SurvivAir ^R 9011-15, 9811-15	4 - 250	50 - 125
TC-19C-69	3M W-810, W-840, W-856, W-858, W-870	25 - 300	50 - 90
TC-19C-70	3M W-820, W-880, W-881, W-888, W-890	25 - 100	65 - 90
TC-19C-71	Scott 4616-18, -19, -28, -29; and 4622-18, -19, -28, -29	6 - 16	15 - 50
		16 - 22	50 - 250
TC-19C-72	Scott 4616-11, -12, -15, -21, -22, -25; and 4622-11, -12, -15, -21, -22, -25	12 - 25	15 - 50
		25 - 40	50 - 250

BB 0002777

ADDENDA: NIOSH CERTIFIED PERSONAL PROTECTIVE EQUIPMENT, SEPTEMBER 1974

The following respiratory protective devices were approved by the Bureau of Mines and the National Institute for Occupational Safety and Health between September 1, 1974 and September 20, 1974:

Dust, Fume, and Mist Respirators

19. MSA[®] part numbers 88479 and 457117 respirators (with part number 88480 filter) for respiratory protection against dusts, fumes, and mists having a time-weighted average less than 0.05 mg/M³, and radionuclides. Approval TC-21C-150, issued to Mine Safety Appliances Co., September 9, 1974.
20. Welsh 7506 respirator (with 7500-6 filters) for respiratory protection against dusts and mists having a time-weighted average not less than 0.05 mg/M³ or 2 mppcf and asbestos-containing dusts and mists. Approval TC-21C-151, issued to Welsh, A Textron Co., September 11, 1974.
21. Welsh 7580 respirator (with 7500-8 filters) for respiratory protection against dusts, fumes, and mists having a time-weighted average less than 0.05 mg/M³, and radionuclides. Approval TC-21C-152, issued to Welsh, A Textron Co., September 11, 1974.

Chemical-Cartridge Respirators

24. Welsh 7504 respirator (with 7500-4 cartridges) for respiratory protection against not more than 300 parts per million of ammonia. Approval TC-23C-63, issued to Welsh, A Textron Co., September 11, 1974.
25. Welsh 7514 respirator (with 7500-4 cartridges and 7500-6 filters) for respiratory protection against not more than 300 parts per million of ammonia, dusts and mists having a time-weighted average not less than 0.05 mg/M³ or 2 mppcf, and asbestos-containing dusts and mists. Approval TC-23C-64, issued to Welsh, A Textron Co., September 11, 1974.
26. Welsh 7503 respirator (with 7500-3 cartridges) for respiratory protection against not more than 1,000 parts per million organic vapors, 10 parts per million chlorine, 50 parts per million hydrogen chloride, or 50 parts per million sulfur dioxide. Approval TC-23C-65, issued to Welsh, A Textron Co., September 11, 1974.
27. Welsh 7513 respirator (with 7500-3 cartridges and 7500-6 filters) for respiratory protection against not more than 1,000 parts per million organic vapors, 10 parts per million chlorine, 50 parts per million hydrogen chloride, or 50 parts per million sulfur dioxide, dusts and mists having a time-weighted average not less than 0.05 mg/M³ or 2 mppcf, and asbestos-containing dusts and mists. Approval TC-23C-66, issued to Welsh, A Textron Co., September 11, 1974.

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28. Willson 1222 respirator (with R22 cartridges) for respiratory protection against not more than 10 parts per million chlorine. Approval TC-23C-67, issued to Willson Products Div., ESB Inc., September 11, 1974.

29. Willson 122210 respirator (with R22 cartridges and R10 filters) for respiratory protection against not more than 10 parts per million chlorine, dusts and mists having a time-weighted average not less than 0.05 mg/M³ or 2 mppcf, and asbestos-containing dusts and mists. Approval TC-23C-68, issued to Willson Products Div., ESB Inc., September 11, 1974.

30. Willson 1223 respirator (with R23 cartridges) for respiratory protection against not more than 50 parts per million sulfur dioxide. Approval TC-23C-69 issued to Willson Products Div., ESB Inc., September 11, 1974.

31. Willson 1224 respirator (with R24 cartridges) for respiratory protection against not more than 300 parts per million ammonia or 100 parts per million methyl amine. Approval TC-23C-70, issued to Willson Products Div., ESB Inc., September 11, 1974.

32. Willson 122410 respirator (with R24 cartridges and R10 filters) for respiratory protection against not more than 300 parts per million ammonia, 100 parts per million methyl amine, dusts and mists having a time-weighted average not less than 0.05 mg/M³ or 2 mppcf, and asbestos-containing dusts and mists. Approval TC-23C-71, issued to Willson Products Div., ESB Inc., September 11, 1974.

33. Willson 122310 respirator (with R23 cartridges and R10 filters) for respiratory protection against not more than 50 parts per million sulfur dioxide, dusts and mists having a time-weighted average not less than 0.05 mg/M³ or 2 mppcf, and asbestos-containing dusts and mists. Approval TC-23C-72, issued to Willson Products Div., ESB Inc., September 11, 1974.

34. Welsh 7511 respirator (with 7500-1 cartridges and 7500-6 filters) for respiratory protection against not more than 1,000 parts per million organic vapors, dusts and mists having a time-weighted average not less than 0.05 mg/M³ or 2 mppcf, and asbestos-containing dusts and mists. Approval TC-23C-73, issued to Welsh, A Textron Co., September 11, 1974.

Tables for identification of component parts of the respirators listed in the addenda will be included in the next cumulative supplement.

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PPG INDUSTRIES, INC./1000 RIDC PLAZA/BLAWNOX, PA. 15238/P. O. BOX 2811/PITTSBURGH, PA. 15230/AREA 412/782-6700

J. T. DESTEFANO, Manager
Environmental Control, Glass Division

July 17, 1975

To: All Holders of OHPM

Subject: Respirator Use

It is the intent of the Glass Division to comply with all legal requirements for respirator use. It is therefore stated that all respirators used in the division will be NIOSH approved for contaminant present.

All OSHA regulations promulgated contain a section on rcpirator applications; these regulations will be followed regarding type of respirator; i.e., chemical cartridge, air supplied, etc. The actual respirator unit will be specified by the plant environmental control engineer in consultation with the Glass Division Industrial Hygienist.

The plant respirator program will then be implemented by incorporating medical examinations, employee education and respirator use inspections.

A handwritten signature in dark ink, appearing to read 'R. L. Rubino'. The signature is stylized with large, flowing letters.

R. L. Rubino
Industrial Hygienist

RLR/lis

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RESPIRATORS APPROVED BY THE BUREAU OF MINES AS OF MAY 24, 1972

A Revision of Information Circular 8436

by

E. J. Kloos¹ and R. H. Schutz²

ABSTRACT

This publication lists devices approved jointly by the Secretary of Interior and the Secretary of Health, Education, and Welfare, as of May 24, 1972, under provisions of Section 11.2, Part 11, Subchapter B of Chapter 1, Title 30, Code of Federal Regulations (37 F.R. 6244, March 25, 1972), for use in mines as respiratory protection in oxygen-deficient atmospheres, and in gases, vapors, dusts, fumes, and mists. Included are self-contained breathing apparatus, gas masks, and supplied-air, dust, fume, mist, and chemical-cartridge respirators. Names and addresses of manufacturers appear in the appendix.

INTRODUCTION

This Bureau of Mines publication, a revision of Information Circular 8436,³ lists respirators approved by the Bureau as of May 24, 1972. The Secretary of Interior and the Secretary of Health, Education, and Welfare have generally restricted use of respirators in hazardous mine atmospheres to those most recently approved (Section 11.2, Part 11, Subchapter B of Chapter 1, Title 30, Code of Federal Regulations, 37 F.R. 6244, March 25, 1972). The newer devices are usually more efficient and comfortable than older approved devices. Therefore, only those respirators approved under Bureau of Mines Schedules 14F for gas masks, 19B for supplied-air respirators, 21B for dust, fume, and mist respirators, and 23B for chemical cartridge respirators are listed. An exception has been made only for self-contained breathing apparatus: All breathing apparatus approved under Schedules 13 through 13E are listed.

¹Research chemist.

²Supervisory research chemist (now Director, Testing and Certification Laboratory, National Institute for Occupational Safety and Health, Department of Health, Education, and Welfare, Morgantown, W. Va.).

³Schutz, R. H., and E. J. Kloos. Respiratory Protective Devices Approved by the Bureau of Mines as of December 31, 1968. A Revision of Information Circular 8281. BuMines Inf. Circ. 8436, 1969, 32 pp.

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It is important to remember the following provisions concerning the use of respirators:

1. Respirators shall not be substituted for environmental control measures in the active workings.
2. Respirators shall be maintained in an approved condition.
3. Respirators shall be selected and used in strict compliance with the limitations specified on the approval label.

The following approved devices, approved as of May 24, 1972, shall be used as respiratory protection, where applicable, against oxygen deficiency, gases, vapors, dusts, fumes, and mists, to comply with the Federal Coal Mine Health and Safety Act of 1969. Devices approved after May 24, 1972, will be listed in subsequent publications.

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SELF-CONTAINED BREATHING APPARATUS

Apparatus	Approval No.	Breathing gas source	Approved service life	Type of apparatus
M-S-A Cat. No. 70001 McCaa.....	1303	Compressed oxygen	2 hours...	Closed circuit.
M-S-A Cat. Nos. 48439 and 458313.....	1303S	do.....	do.....	Do.
M-S-A Chemox Cat. Nos. 96578 and 458310..	1307	Oxygen-generating canister.	1 hour....	Do.
Scott Air-Pak Model No. 6000A2MS.....	1308	Compressed air...	1/2 hour..	Open-circuit demand.
Scott Air-Pak Model No. 6000A2MSP.....	1308, 13D-08	do.....	do.....	Open-circuit demand and pressure-demand.
Scott Air-Pak I Model No. 900000 series..	13D-08, 13E-08	do.....	do.....	Open-circuit demand.
Scott Air-Pak II Model No. 900014 series.	13D-08, 13E-08	do.....	do.....	Open-circuit demand and pressure-demand.
M-S-A Cat. No. 95766.....	13D-10	do.....	do.....	Open-circuit demand.
M-S-A Cat. Nos. 93181 and 95767.....	13D-10	do.....	do.....	Open-circuit pressure-demand.
M-S-A Cat. Nos. 95066 and 457153.....	13E-10	do.....	do.....	Open-circuit demand.
M-S-A Cat. No. 95069.....	13E-10	do.....	do.....	Open-circuit pressure-demand.
Globe Guardsman part Nos. 2275-2GA and 2295-2GA.	13D-11	do.....	do.....	Open-circuit demand.
Globe Guardsman part No. 2526-2.....	13E-11	do.....	do.....	Do.
U.S. Divers Model No. 9030.....	13D-12	do.....	do.....	Do.
U.S. Divers Model No. 9030-20.....	13D-12	do.....	do.....	Open-circuit demand and pressure-demand.
Ar Models LP-1-A and LPA.....	13D-14	Liquid air.....	2 hours...	Open-circuit pressure-demand.
Aro Models LP-1-0 and LPO.....	13D-15	Liquid oxygen....	do.....	Do.
Drager BG-174.....	13D-16	Compressed oxygen	do.....	Closed circuit.
M-S-A Cat. No. 95063.....	13E-21	Compressed air...	1/2 hour..	Open-circuit pressure-demand.
Scott part Nos. 900002 and 9000015.....	13E-22	do.....	15 minutes	Open-circuit demand and pressure-demand.
M-S-A Cat. No. 96359.....	13E-23	do.....	10 minutes	Open-circuit pressure-demand; combination escape apparatus and Type C supplied-air respirator.
U.S. Divers Model No. 9038.....	13E-24	do.....	1/2 hour..	Open-circuit demand.
U.S. Divers Model No. 9038-20.....	13E-24	do.....	do.....	Open-circuit demand and pressure-demand.
Scott part No. 900050.....	13E-25	Compressed oxygen	4 hours...	Closed circuit.
Drager BG-174A.....	13E-26	do.....	3 hours...	Do.

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GAS MASKS

Gas mask	Appro- val No.	Approved for respiratory protection against--									Particulate matter	
		Acid gases	Chlo- rine	Hydro- cyanic acid	Hydro- gen sul- fide	Organic vapors	Petro- leum vapors	Ammo- nia	Phos- phine	Car- bon monox- ide	Limited effi- ciency filter	High effi- ciency filter
Acme 679-1 and 679-1-P	14F-18	-	-	-	-	X	-	-	-	-	-	-
Willson WIG, WIGW, and TIGW (G1).....	14F-23	-	-	-	-	X	-	-	-	-	-	-
Welsh 7815 and 7815T.....	14F-27	-	X	-	-	-	-	-	-	-	-	-
Willson WLG, WLGW, and TLGW (LG1).....	14F-37	-	-	-	-	X	-	-	-	-	-	-
Willson WLG, WLGW, and TLGW (LG4).....	14F-38	-	-	-	-	-	-	X	-	-	-	-
Willson WUG, WUGW, and TUGW (N1W).....	14F-43A	X	-	-	-	X	-	X	-	X	X	-
Willson WTC, WTCW, and TTGW (LG9).....	14F-44	-	-	-	X	-	X	-	-	-	-	-
Willson WUG, WUGW, and TUGW (N2W).....	14E-45A	X	-	-	-	X	-	X	-	X	X	X
Willson WLG, WLGW, and TLGW (LG1G).....	14F-46	-	-	-	-	X	-	-	-	-	-	X
M-S-A Self-Rescuer 48391.....	14F-47	-	-	-	-	-	-	-	-	X	-	-
Willson WLG, WLGW and TLGW (LG3).....	14F-50	X	-	-	-	X	-	-	-	-	-	-
Welsh 7814 and 7814T.....	14F-52	-	-	-	-	-	-	X	-	-	-	-
Willson WIG, WIGW, and TIGW (G8).....	14F-53	-	X	-	-	-	-	-	-	-	-	-
Willson WIG, WIGW, and TIGW (G4).....	14F-54	-	-	-	-	-	-	X	-	-	-	-
Acme 677-1, 677-1-P, 677-1W, and 677-1-PW.....	14F-55	-	-	-	-	-	-	X	-	-	-	-
M-S-A 84867, 86197, 86198, 86171, 457081, and 457077...	14F-56	-	-	-	-	X	-	-	-	-	X	-
M-S-A 86175, 84891, 84883, 86223, 86224, 457070, 457085, and 457065.....	14F-57	-	-	-	-	X	-	-	-	-	X	-
M-S-A 81869, 86199, 86200, 86172, 457082, and 457078...	14F-58	-	-	-	-	-	-	X	-	-	X	-
M-S-A 86177, 84889, 84881, 86221, 86222, 457072, 457086, and 457066.....	14F-59	-	-	-	-	-	-	X	-	-	X	-

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M-S-A 84871, 86201, 86202, 86173, 457083, and 457080...	14F-60	-	X	-	-	-	-	-	-	-	-	X	-
M-S-A 84879, 84893, 84885, 86225, 86226, 457069, 457087, and 457067.....	14F-61	-	-	-	X	X	-	-	X	-	-	X	-
M-S-A 84873, 86203, 86204, 86174, 457084, and 457079...	14F-62	-	-	X	-	-	-	-	-	-	-	X	-
M-S-A 86178, 86113, 86115, 86229, 86230, 457073, 457088, and 457132.....	14F-63	-	-	X	-	-	-	-	-	-	-	X	-
M-S-A 86176, 86109, 86111, 86227, 86228, 457071, 457089, and 457068.....	14F-64	X	-	-	-	X	-	-	-	-	-	X	-
M-S-A 84877, 86207, and 86208.....	14F-65	X	-	-	-	X	-	X	-	-	X	X	-
M-S-A "All Service".....	14F-65A	X	-	-	-	X	-	X	-	-	X	X	-
M-S-A 86217, 86209, and 86210.....	14F-66	X	-	-	-	X	-	X	-	-	X	X	X
M-S-A 86218, 86211, 86212, 85859, 457076, and 457074...	14F-66A	X	-	-	-	X	-	X	-	-	X	X	X
Willson WLG, WLGW, and TLCW (LG10).....	14F-68	-	-	-	-	X	-	-	X	-	-	-	-
Willson WLG, WLGW, and TLCW (LG10G).....	14F-69	-	-	-	-	X	-	-	X	-	-	X	X
Acme 688-1.....	14F-70	-	-	-	-	X	-	-	X	-	-	X	X
Welsh 7811 and 7811T.....	14F-71	-	-	-	-	X	-	-	-	-	-	X	-
Pulmosan 1806.....	14F-72	-	X	-	-	-	-	-	-	-	-	-	-
Pulmosan 1803.....	14F-73	-	-	-	-	-	-	X	-	-	-	-	-
Pulmosan 1801F.....	14F-74	-	-	-	-	X	-	-	-	-	-	X	-
Scott/Acme 691-1, 691-2, and 691-1-P.....	14F-75	X	-	-	-	X	-	-	-	-	-	-	-
M-S-A Self-Rescuer W-65.....	14F-76	-	-	-	-	-	-	-	-	-	X	-	-
Scott/Acme 184-CL and 184-CL-W.....	14F-77	-	X	-	-	-	-	-	-	-	-	-	-
Welsh 7831 and 7831T.....	14E-78	X	-	-	-	X	-	X	-	-	X	X	-
Welsh 7832 and 7832T.....	14E-79	X	-	-	-	X	-	X	-	-	X	X	X
Drager Self-Rescuer No. 810..	14F-80	-	-	-	-	-	-	-	-	-	X	-	-
Scott/Acme Self-Rescuer 8164..	14F-81	-	-	-	-	-	-	-	-	-	X	X	-

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DEMAND-FLOW, SUPPLIED-AIR RESPIRATORS

Respirator	Approval No.	Pressure range, psi	Type of respiratory inlet covering	
			Half-mask	Full facepiece
Scott 26000 and 800000 series and Scott/Acme 4637-1, 4637-2, and 4637-3.....	19B-36	50-125	X	X
M-S-A 46539, 46986, 78315, 84283, 93928, 94842, 94843, 94988, and 457165.....	19B-42	30-125	X	X
M-S-A 93224, 93225, 93226, 93227, and 457157.....	19B-43	30-125	X	X
Aro.....	19B-46	90-110	X	X
Willson GDFW, TDFW, and GD2.....	19B-47	25-125	X	X
SurvivAir 9011-9.....	19B-49	50-125	X	-
SurvivAir 9011-1.....	19B-50	50-125	-	X

PRESSURE-DEMAND FLOW, SUPPLIED-AIR RESPIRATORS

Respirator	Approval No.	Pressure range, psi	Type of respiratory inlet covering
Aro.....	19B-45	90-110	All currently approved pressure-demand supplied-air respirators are equipped with full facepieces.
SurvivAir 9011-02..	19B-51	50-125	
M-S-A 89104.....	19B-55	80-100	

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CONTINUOUS-FLOW, SUPPLIED-AIR RESPIRATORS

Respirator	Approval No.	Pressure range, psi	Half-mask	Full facepiece	Hood or helmet
Sly "Purair" helmet.....	19B-11	3-5	-	-	X
Willson GA2, GA8, GAF, GAFW, and TAFW..	19B-12	10-25	X	X	-
Willson GA2H, GAHW, and TAHW.....	19B-30	40-100	X	X	-
Scott-Acme 4615-1, 4616-1, 4615-3, and 4616-3.....	19B-31	8-17/17-30	X	X	-
M-S-A 82554, 82254, 82597, and 82584...	19B-32	12-16	-	-	X
M-S-A 84612 and 84535.....	19B-33	40-100	X	X	-
M-S-A 84535, 84612, 87058, 87043, and 457161.....	19B-34A	40-100	X	X	-
M-S-A 457162, 93520, 93516, 93513, and 93524.....	19B-34B	10-15	X	X	-
Chicago Eye Shield Nos. 603 RH, RS, and RG.....	19B-35	15-35	-	-	X
M-S-A 87071.....	19B-37A	40-100	X	-	-
M-S-A 93521 and 93522.....	19B-37B	10-15	X	-	-
M-S-A 93518, 93527, and 93530.....	19B-38	10-15	-	X	-
M-S-A 87963, 87964, and 87965.....	19B-38A	40-100	-	X	-
M-S-A 84304, 82289, 88377, and 88376...	19B-41	10-15	-	X	X
M-S-A 84304, 82289, 88376, 88377, and 84536.....	19B-41A	40-100	-	X	X
Pulmosan AL-180 and HA-99.....	19B-44	20-25	-	X	X
Rite Hardware 460-15.....	19B-48	12-20	-	-	X
M-S-A 72662, 34727, 34728, 94494, and 450168.....	19B-52	16-22	-	X	X
M-S-A 94861, 94862, 94863, and 94864...	19B-53	15-20	-	-	X
A. O. R6099.....	19B-54	8.5-25	X	-	-
Personal Environment Systems 810, 858, 870, and 856.....	19B-56	25-35	-	-	X
Bullard 46-S, 46-D, 36-L, 36-LD, 77-S, and 77-D.....	19B-57	80-95	-	-	X
Personal Environment Systems 820, 880, 888, and 881.....	19B-58	60-80	-	-	X
Personal Environment Systems 920, 980, 988, and 981.....	19B-59	60-80	-	-	X
A. O. ASH series.....	19B-60	10-60	-	-	X
Safeline 7501-7511 series.....	19B-61	10-60	-	-	X
Safeline 5775.....	19B-63	8.5-25	X	-	-

HOSE MASKS, SUPPLIED-AIR RESPIRATORS

Respirator	Approval No.	Hose length	Half-mask	Full facepiece	Hood or helmet
M-S-A type B 457623	19B-62	75 ft	-	X	-

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DUST, FUME, AND MIST RESPIRATORS

Respirator	Approval No.	Protection afforded in addition to dusts			
		Mists	Fumes	Radio-nuclides	Radon daughters
Pulmosan L-800.....	21B-60	-	-	-	-
A. O. R5056 and R6056.....	21B-63	X	X	-	-
Safeline 5241.....	21B-63	X	X	-	-
M-S-A 86431.....	21B-69	X	X	-	X
Pulmosan C-251.....	21B-71	X	X	-	-
A. O. R2090.....	21B-72	X	-	-	-
Devilbiss MSD-505.....	21B-72	X	-	-	-
Pulmosan C-264.....	21B-73	X	-	-	-
A. O. R5030.....	21B-74	X	-	-	-
Safeline 5265.....	21B-74	X	-	-	-
Pulmosan L-801.....	21B-76	X	-	-	-
Cesco 90F.....	21B-77	X	-	-	-
A. O. R6030.....	21B-78	X	-	-	-
Welsh 7506.....	21B-79	X	-	-	-
Safeline 5441.....	21B-81	X	-	-	-
Bausch & Lomb 5R20.....	21B-82	X	-	-	-
Glendale Optical GR 2000 and 4000...	21B-82	X	-	-	-
Bausch & Lomb 5R10.....	21B-83	-	-	-	-
Glendale Optical GR 1000 and 3000...	21B-83	-	-	-	-
A. O. R9166.....	21B-84	X	X	-	-
Safeline 5701.....	21B-84	X	X	-	-
A. O. R3030.....	21B-85	X	-	-	-
A. O. R8156.....	21B-87	X	X	-	-
A. O. R8100.....	21B-88	X	-	-	-
Glendale GR 2026 ¹	21B-89	-	X	-	-
Bausch & Lomb 5R26 ¹	21B-89	-	X	-	-
M-S-A 86432.....	21B-90	X	X	X	-
3M 8700.....	21B-91	X	-	-	-
Safeline 5550.....	21B-92	X	-	-	-
Safeline 5556.....	21B-93	X	-	-	-
Willson 1009.....	21B-94	X	X	X	-
Willson RFMW-809 and TFMW-809.....	21B-95	X	X	X	-
M-S-A 96000.....	21B-97	X	-	-	-
A. O. R6057 and R5057.....	21B-98	X	X	X	-
Safeline 5245.....	21B-98	X	X	X	-
Scott/Acme 659-1.....	21B-99	X	X	X	-
Scott/Acme 8201-R.....	21B-100	X	X	X	-
M-S-A 88479 and 457117.....	21B-101	X	X	X	-
M-S-A 84303 and 457116.....	21B-102	X	X	X	-
Protector 1054.....	21B-103	X	-	-	-
Personal Environmental Systems 330, 350, 351, and 360.....	21B-104	X	X	-	-
Welsh 75BP-80, 7580, and 7580RD.....	21B-105	X	X	X	X
Welsh 7680.....	21B-106	X	X	X	-

¹Not approved for dust.

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DUST, FUME, AND MIST RESPIRATORS--Continued

Respirator	Approval No.	Protection afforded in addition to dusts			
		Mists	Fumes	Radio-nuclides	Radon daughters
A. O. 1040.....	21B-107	X	-	-	-
Safeline 5340.....	21B-108	X	-	-	-
North RP-161.....	21B-109	-	-	-	-
Willson 1210.....	21B-110	X	-	-	-
Willson 1211.....	21B-111	X	X	-	-
M-S-A 76869.....	21B-113	X	-	-	-
Welsh 7100.....	21B-114	X	-	-	-
Scott/Acme 8101-R.....	21B-115	X	X	X	-
Scott/Acme 659-1, 662-1, 662-2, and 652-1 with 502R filter.....	21B-116	X	X	X	-
Welsh 7406.....	21B-117	-	-	-	-
Welsh 7506.....	21B-118	X	-	-	-
M-S-A 86430 and 94688.....	21B-119	X	-	-	-
M-S-A Peru.....	21B-120	X	-	-	-
Willson 560.....	21B-121	X	-	-	-
M-S-A 456608.....	21B-122	X	-	-	-
M-S-A 456607.....	21B-123	X	-	-	-
North RP-162.....	21B-124	X	-	-	-
A. O. 8190.....	21B-125	X	X	-	X
Safeline 5540.....	21B-126	X	X	-	X
A. O. 8157.....	21B-127	X	X	X	-
Safeline 5557.....	21B-128	X	-	-	-
Welsh 7165.....	21B-129	-	-	-	-
M-S-A 459059.....	21B-130	X	X	X	-
Pulmosan C-263 with 10924 face cushion.....	21B-131	X	X	X	-

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CHEMICAL CARTRIDGE RESPIRATORS

Respirator	Approval No.	Approved for protection against inhalation of organic vapors and--					
		Pneumo- coniosis- producing dusts	Toxic dusts	Pneumo- coniosis- producing mists	Toxic mists	Toxic fumes	Mists of paints, lacquers, and enamels
M-S-A 85556.....	23B-01	X	X	X	X	-	-
Binks.....	23B-01	X	X	X	X	-	-
A. O. R5051 and R6051.....	23B-04	-	-	-	-	-	-
Devilbiss MSE-502...	23B-04	-	-	-	-	-	-
Safeline 5211.....	23B-04	-	-	-	-	-	-
A. O. 5055 and 6055.	23B-05	X	X	X	X	-	-
Safeline 5235.....	23B-05	X	X	X	X	-	-
M-S-A 48334.....	23B-06	-	-	-	-	X	-
Pulmosan C-256 and 259.....	23B-09	X	X	-	-	-	-
M-S-A 76853.....	23B-10	-	X	-	-	-	-
A. O. R5561 and R6561.....	23B-11	X	X	X	X	X	-
Safeline 5275.....	23B-11	X	X	X	X	X	-
M-S-A 84306.....	23B-12	-	-	-	-	-	X
Binks 40-80.....	23B-12	-	-	-	-	-	X
A. O. R5051P and R6051P.....	23B-13	X	X	X	X	-	X
Devilbiss MSP-505...	23B-13	X	X	X	X	-	X
Safeline 5215.....	23B-13	X	X	X	X	-	X
Willson 941-P.....	23B-14	-	-	-	-	-	X
A. O. R5091P and R6091P.....	23B-15	X	X	X	X	-	X
Devilbiss 43652-009.	23B-15	X	X	X	X	-	X
Safeline 5271.....	23B-15	X	X	X	X	-	X
Pulmosan C-251.....	23B-16	-	-	-	-	-	X
Welsh 7511.....	23B-17	X	X	X	X	-	X
Welsh 7531.....	23B-18	-	-	-	-	-	X
A. O. R9051.....	23B-19	-	-	-	-	-	-
Safeline 5702.....	23B-19	-	-	-	-	-	-
A. O. R9051P.....	23B-20	X	X	X	X	-	X
Safeline 5719.....	23B-20	X	X	X	X	-	X
A. O. R9055.....	23B-21	X	X	X	X	-	-
Safeline 5706.....	23B-21	X	X	X	X	-	-
A. O. R9091P.....	23B-22	X	X	X	X	-	X
Safeline 5713.....	23B-22	X	X	X	X	-	X
A. O. R9561.....	23B-23	X	X	X	X	X	-
Safeline 5714.....	23B-23	X	X	X	X	X	-
A. O. R8151.....	23B-24	-	-	-	-	-	-
Glendale GR 2021-10.	23B-25	X	X	X	X	-	-

CHEMICAL CARTRIDGE RESPIRATORS--Continued

Respirator	Approval No.	Approved for protection against inhalation of organic vapors and--					
		Pneumo-coniosis-producing dusts	Toxic dusts	Pneumo-coniosis-producing mists	Toxic mists	Toxic fumes	Mists of paints, lacquers, and enamels
Bausch & Lomb 5R2110	23B-25	X	X	X	X	-	-
A. O. 8155.....	23B-26	X	X	X	X	-	-
Glendale GR 2021-20.	23B-27	-	-	-	-	-	X
Bausch & Lomb 5R2120	23B-27	-	-	-	-	-	X
Scott/Acme 8201-OV..	23B-28	-	-	-	-	-	-
Scott/Acme 8101-OV..	23B-29	-	-	-	-	-	-
Safeline 5551.....	23B-30	-	-	-	-	-	-
Safeline 5555.....	23B-31	X	X	X	X	-	-
A. O. R8151P.....	23B-32	X	X	X	X	-	X
Safeline 5560.....	23B-32	X	X	X	X	-	X
A. O. R8191P.....	23B-33	X	X	X	X	-	X
Safeline 5521.....	23B-33	X	X	X	X	-	X
A. O. R8175P.....	23B-34	X	X	X	X	-	X
Willson 1221.....	23B-35	-	-	-	-	-	-
Willson 122110.....	23B-36	X	X	X	X	-	-
Willson R122113.....	23B-37	X	X	X	X	X	-
Willson R122114.....	23B-38	-	-	-	-	-	X
Scott/Acme 8176.....	23B-39	-	-	-	-	-	X

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APPENDIX--NAMES AND ADDRESSES OF COMPANIES TO WHICH RESPIRATOR
APPROVALS HAVE BEEN GRANTED

Acme Products Division, Scott Aviation, 1201 Kalamazoo St., South Haven,
Mich. 49090
American Optical Corp., Southbridge, Mass. 01551
Aro Corp., One Aro Center, Bryan, Ohio 43506
Bausch & Lomb, Inc., P.O. Box 478, Rochester, N.Y. 14602
Binks Manufacturing Co., 3114-40 Carroll Ave., Chicago, Ill. 60612
E. D. Bullard Co., 2680 Bridgeway, Sausalito, Calif. 94965
The Devilbiss Co., Toledo, Ohio 43601
Glendale Optical (American Cyanamid) Co., Bound Brook, N.J. 08805
Globe Safety Products, Inc., 125 Sunrise Pl., Dayton, Ohio 45407
Mine Safety Appliances Co., 201 North Braddock Ave., Pittsburgh, Pa. 15208
Minnesota Mining & Manufacturing Co. (3M), 3M Center, St. Paul, Minn. 55101
National Mine Service Co., 3000 Koppers Bldg., Pittsburgh, Pa. 15219
North (James) Pty Ltd., P.O. Box 88, Annandale, Sydney, N.S.W. 2038, Australia
Parmalee Industries, Inc., 1535 Walnut St., Kansas City, Mo. 64108
Personal Environment Systems, P.O. Box 800, Glendale, Calif. 91204
Protector International Pty Ltd., Box M 76, Sydney Mail Exchange, N.S.W. 2012,
Australia
Pulmosan Safety Equipment Corp., 30-48 Linden Pl., Flushing, N.Y. 11354
Scott Aviation, 225 Erie St., Lancaster, N.Y. 14086
U.S. Divers (SurvivAir), 3323 West Warner Ave., Santa Ana, Calif. 92702
Welsh Manufacturing Co., 9 Magnolia St., Providence, R.I. 02909
Willson Products Division, ESB, Inc., P.O. Box 622, Reading, Pa. 19603
W. W. Sly Manufacturing Co., 4735 Train Ave., Cleveland, Ohio 44102

Safeline Products, P. O. Box 550, Putnam, Conn. 06260

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PPG OCCUPATIONAL HEALTH POLICY MANUAL

SECTION 50 - HAZARDOUS MATERIALS

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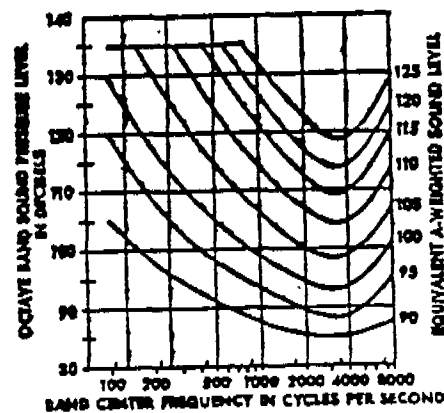
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PPG OCCUPATIONAL HEALTH POLICY MANUAL
SECTION 50.11
OCCUPATIONAL NOISE AND
AIR CONTAMINANTS
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§ 1910.95 Occupational noise exposure.

(a) Protection against the effects of noise exposure shall be provided when the sound levels exceed those shown in Table G-16 when measured on the A scale of a standard sound level meter at slow response. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level may be determined as follows:

Figure G-1



Equivalent sound level contours. Octave band sound pressure levels may be converted to the equivalent A-weighted sound level by plotting them on this graph and noting the A-weighted sound level corresponding to the point of highest penetration into the sound level contours. This equivalent A-weighted sound level, which may differ from the actual A-weighted sound level of the noise, is used to determine exposure limits from Table G-16.

(b) (1) When employees are subjected to sound exceeding those listed in Table

G-16. feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels within the levels of Table G-16, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.

(2) If the variations in noise level involve maxima at intervals of 1 second or less, it is to be considered continuous.

(3) In all cases where the sound levels exceed the values shown herein, a continuing, effective hearing conservation program shall be administered.

TABLE G-16—PERMISSIBLE NOISE EXPOSURES¹

Duration per day, hours	Sound level dBA slow response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115

¹ When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $O_1/T_1 + O_2/T_2 + \dots + O_n/T_n$ exceeds unity, then, the mixed exposure should be considered to exceed the limit value. O_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

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Subpart G—Occupational Health and Environmental Control

§ 1910.93 Air contaminants.

An employee's exposure to any material listed in table G-1, G-2, or G-3 of this section shall be limited in accordance with the requirements of the following paragraphs of this section.

(a) Table G-1:

(1) *Materials with names preceded by "C"—Ceiling Values.* An employee's exposure to any material in table G-1, the name of which is preceded by a "C" (e.g., C Boron trifluoride), shall at no time exceed the ceiling value given for that material in the table.

(2) *Other materials—8-hour time weighted averages.* An employee's exposure to any material in table G-1, the name of which is not preceded by "C", in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average given for that material in the table.

(b) Table G-2:

(1) *8-hour time weighted averages.* An employee's exposure to any material listed in table G-2, in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average limit given for that material in the table.

(2) *Acceptable ceiling concentrations.* An employee's exposure to a material listed in table G-2 shall not exceed at any time during an 8-hour shift the acceptable ceiling concentration limit given for the material in the table, except for a time period, and up to a concentration not exceeding the maximum duration and concentration allowed in the column under "acceptable maximum peak above the acceptable ceiling concentration for an 8-hour shift".

(3) *Example.* During an 8-hour work shift, an employee may be exposed to a concentration of Benzene above 25 p.p.m. (but never above 50 p.p.m.) only for a maximum period of 10 minutes. Such exposure must be compensated by exposures to concentrations less than 10 p.p.m. so that the cumulative exposure for the entire 8-hour work shift does not exceed a weighted average of 10 p.p.m.

(c) Table G-3: An employee's exposure to any material listed in table G-3, in any 8-hour work shift of a 40-hour work week, shall not exceed the 8-hour time weighted average limit given for that material in the table.

(d) Computation formulas:

(1) (i) The cumulative exposure for an 8-hour work shift shall be computed as follows:

$$E = \frac{C_1 T_1 + C_2 T_2 + \dots + C_n T_n}{8}$$

where:

E is the equivalent exposure for the working shift.

C is the concentration during any period of time T where the concentration remains constant.

T is the duration in hours of the exposure at the concentration C.

The value of E shall not exceed the 8-hour time weighted average limit in table

RULES AND REGULATIONS

G-1, G-2, or G-3 for the material involved.

(ii) To illustrate the formula prescribed in subdivision (i) of this subparagraph, note that isoamyl acetate has an 8-hour time weighted average limit of 100 p.p.m. (table G-1). Assume that an employee is subject to the following exposure:

Two hours exposure at 150 p.p.m.
Two hours exposure at 75 p.p.m.
Four hours exposure at 50 p.p.m.

Substituting this information in the formula, we have

$$\frac{2 \times 150 + 2 \times 75 + 4 \times 50}{8} = 81.25 \text{ p.p.m.}$$

Since 81.25 p.p.m. is less than 100 p.p.m., the 8-hour time weighted average limit, the exposure is acceptable.

(2) (i) In case of a mixture of air contaminants an employer shall compute the equivalent exposure as follows:

$$E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$$

Where:

E_m is the equivalent exposure for the mixture.

C is the concentration of a particular contaminant.

L is the exposure limit for that contaminant, from table G-1, G-2, or G-3.

The value of E_m shall not exceed unity (1).

(ii) To illustrate the formula prescribed in subdivision (i) of this subparagraph, consider the following exposures:

Material	Actual concentration of 8-hour exposure	8-hour time weighted average exposure limit
Acetone (Table G-1)	500 p.p.m.	1,000 p.p.m.
2-Butanone (Table G-1)	50 p.p.m.	300 p.p.m.
Toluene (Table G-2)	40 p.p.m.	300 p.p.m.

Substituting in the formula, we have:

$$E_m = \frac{500}{1,000} + \frac{50}{300} + \frac{40}{300}$$

$$E_m = 0.500 + 0.225 + 0.200$$

$$E_m = 0.925$$

Since E_m is less than unity (1), the exposure combination is within acceptable limits.

(e) To achieve compliance with paragraph (a) through (d) of this section, administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section. Any equipment and/or technical measures used for this purpose must be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with § 1910.134.

TABLE G-1

Substance	p.p.m.*	mg./M ³ †
Acetaldehyde	200	200
Acetic acid	10	25
Acetic anhydride	5	20
Acetone	1,000	2,000
Acetonitrile	40	70
Acetylene dichloride, see 1,2-Dichloroethane		
Acetylene tetrachloride	1	14
Acrolein	0.1	0.25
Acrylamide—Skin		0.3
Acrylonitrile—Skin	20	45
Alidin—Skin		0.25
Allyl alcohol—Skin	2	5
Allyl chloride	1	3
**C Allyl glycidyl ether (AGE)	10	45
Allyl propyl disulfide	2	13
2-Aminoethanol, see Ethanolamine		
2-Aminopyridine	0.5	5
**Ammonia	50	35
Aminomethanesulfonate (Aminomale)		15
n-Amyl acetate	100	250
n-Amyl acetate	125	300
Aniline—Skin	5	19
Aniline (o, p-isomers)—Skin		0.5
Antimony acid compound (as Sb)		0.5
ANTU (alpha naphthylthiourea)		0.5
Arsenic and compounds (see As)		0.5
Arsine	0.05	0.5
Asiaphen—methyl—Skin		0.5
Bertum (soluble compound)		0.5
p-Benzquinone, see Quinone		
Benzoyl peroxide		5
Benzyl chloride	1	5
Biphenyl, see Diphenyl		
Bisphenol A, see Diglycidyl ether		
Boron oxide		15
C Boron trifluoride	1	5
Bromine	0.1	0.7
Bromoform—Skin	0.5	5
Butadiene (1,3-butadiene)	1,000	2,200
Butanethiol, see Butyl mercaptan		
2-Butanone	200	500
2-Butoxy ethanol (Butyl Cellosolve)—Skin	50	240
Butyl acetate (n-butyl acetate)	150	710
sec-Butyl acetate	200	950
tert-Butyl acetate	300	950
Butyl alcohol	100	300
sec-Butyl alcohol	150	450
tert-Butyl alcohol	150	300
C Butylamine—Skin	5	15
C tert-Butyl chromate (as CrO ₃)—Skin		0.1
n-Butyl glycidyl ether (BOGE)	50	270
*Butyl mercaptan	50	35
p-tert-Butyltoluene	10	50
Calcium arsenate		1
Calcium oxide		5
**Camphor	5	5
Carbaryl (Sevin®)		5
Carbon black		5
Carbon disulfide	5,000	5,000
Carbon monoxide	50	50
Chloroacetaldehyde		0.5
Chloroacetylene		0.5
Chlorinated camphene—Skin		0.5
Chlorinated diphenyl oxide		0.5
*Chlorine	1	5
Chlorine dioxide	0.1	0.5
C Chlorine trifluoride	0.1	0.5
C Chloroacetaldehyde	1	5
Chloroacetophenone (phenacyl chloride)		0.5
Chlorobenzene (monochlorobenzene)	75	250
o-Chlorobenzonitrile		0.5
Chlorobromomethane	200	1,000
2-Chloro-1,3-butadiene, see Chloroprene		
Chlorodiphenyl (45 percent Chlorine)—Skin		1
Chlorodiphenyl (54 percent Chlorine)—Skin		0.5
1-Chloro-2-isopropylpyrene, see Epichlorohydrin		
2-Chloroethanol, see Ethylene chlorohydrin		
Chloroethylene, see Vinyl chloride		
C Chloroform (trichloromethane)	50	300
1-Chloro-2-chloropropene	50	300
Chloroform	5.1	5.1
Chloroprene (2-chloro-1,3-butadiene)—Skin	20	50

TABLE G-1—Continued

Substance	p.p.m.*	mg./M ³ †
Chromium, and chromic, chromous salts as Cr		0.5
White and red, acids		1
Coal tar pitch volatiles (benzene soluble fraction) anthracene, BaP, phenanthrene, acridine, chrysene, pyrene		0.2
Cobalt, metal fume and dust		0.1
Copper fume		0.1
Crotonaldehyde		1
Cotton dust (raw)		1
Crystalline herbicide		15
Cresol (all isomers)—Skin	5	22
Crotonaldehyde	2	5
Cumene—Skin	50	245
Cyanide (as CN)—Skin		5
Cyclohexane	300	1,050
Cyclohexanol	50	200
Cyclohexanone	50	200
Cyclohexene	300	1,015
Cyclopentadiene	75	200
2,4-D		10
DDE—Skin		1
DVP, see Dichlorvos		
Decaborane—Skin		0.5
Decomposed—Skin		0.1
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	50	240
1,2-Diaminoethane, see Ethylenediamine		
Diamethane	0.2	0.4
Diborane	0.1	0.1
Dibutylphthalate		5
O-o-Dichlorobenzene	50	300
p-Dichlorobenzene	75	450
Dichlorodifluoromethane	1,000	4,050
1,2-Dichloro-4,5-dimethylhydantoin		0.2
1,1-Dichloroethane	100	400
1,2-Dichloroethane	200	790
C Dichloroethyl ether—Skin	15	50
Dichloromethane, see Methylene chloride		
Dichloromonoethoxymethane	1,000	4,300
C 1,1-Dichloro-1-ethoxymethane	10	50
1,2-Dichloropropane, see Propylenedichloride		
Dichlorotetrafluoroethane	1,000	7,000
Dichlorvos (DDVP)—Skin		1
Dieldrin—Skin		0.25
Diethylamine	25	75
Diethylamine ethoxide—Skin	10	50
Diethyl ether, see Ethyl ether		
Difluorodibromomethane	100	500
C Diglycidyl ether (DGE)	0.5	2.5
Dihydroxybenzene, see Hydroquinone		
Dimethyl ketone	50	200
Dimethylamine—Skin	5	20
Dimethylamine, see Methylamine		
Dimethylamine—Skin	10	35
Dimethylamine	10	15
Dimethylaminobenzene, see Xylenes		
Xylenes		5
Dimethylamine (N-dimethylamine)—Skin	5	25
Dimethylbenzene, see Xylenes		
Dimethyl 1,3-dibromo-4,5-dichlorophosphate (Dibrom)		5
Dimethylamine—Skin	10	35
Dimethylamine—Skin	10	35
Dimethylamine (all isomers)—Skin		1
Dinitro-o-cresol—Skin		0.5
Dinitrobenzene—Skin		1.5
Dioxane (1,4-dioxane)	500	500
Diphenyl	5.1	5.1
Diphenylmethane diisocyanate (see Methylene bisphenyl isocyanate (MDI))		
Dipropylene glycol methacrylate—Skin	200	500
Di-sec-octyl phthalate (DOP-ethylhexylphthalate)		5
Endrin—Skin		0.1
Epichlorohydrin—Skin	5	30
EPN—Skin		0.5
1,2-Epoxypropane, see Propylene oxide		
1,2-Epoxypropane, see Propylene oxide		

See footnotes at end of table.

TABLE G-1—Continued

Substance	p.p.m.	mg./lit.
Ethanethiol, see Ethylmercaptan		
Ethanolamine	3	6
2-Ethoxyethanol-Alkin	200	760
2-Ethoxyethylacetate (Cellosolve acetate)-Skin	100	560
Ethyl acetate	400	1,400
Ethyl acrylate-Skin	25	100
Ethyl alcohol (ethanol)	1,000	1,900
Ethylamine	10	18
Ethyl sec-amyl ketone (2-methyl-2-heptanone)	25	120
Ethyl benzene	100	435
Ethyl bromide	300	960
Ethyl butyl ketone (2-Heptanone)	1	230
Ethyl chloride	1,000	2,700
Ethyl ether	400	1,200
Ethyl formate	180	800
C Ethyl mercaptan	10	25
Ethyl sulfide	100	260
Ethylene dichloride-Skin	5	25
Ethylene diamine	10	25
Ethylene dibromide, see 1,2-Dibromoethane		
Ethylene dichloride, see 1,2-Dichloroethane		
O Ethylene glycol diformate and/or Nitroxyacetic-Skin	40.5	1
Ethylene glycol monomethyl ether acetate, see Methyl cellosolve acetate		
Ethylene imine-Skin	0.5	1
Ethylene oxide	50	50
Ethylidene chloride, see 1,1-Dichloroethane		
N-Ethylmorpholine-Skin	20	64
Formalin	100	15
Formaldehyde dust	1	2
Fluoride (as F)	1	1
Fluorine	0.1	0.2
Fluorotrichloromethane	1,000	4,800
Formic acid	5	9
Furfural-Skin	5	20
Furfuryl alcohol	50	200
Glycidol (2,3-Epoxy-1-propanol)	50	180
Glycol monomethyl ether, see 2-Ethoxyethanol		
Guthion (S, see Asialapha-methyl		
Hydrium		0.5
Hydrochloric-Skin		0.5
Hydrene (n-hexane)	500	2,000
1-Hydrochloroethane-Skin	1	10
2-Hydrochloroethanol-Skin		0.2
Hexane (n-hexane)	500	1,800
2-Hexanone	100	410
Hexone (Methyl isobutyl ketone)	180	410
sec-Hexyl acetate	50	300
Hydrazine-Skin	1	1.5
Hydrogen bromide	5	10
C Hydrogen chloride	5	8
Hydrogen cyanide-Skin	10	11
Hydrogen peroxide (30%)	1	1.4
Hydrogen sulfide	0.05	0.2
Hydroquinone	2	2
C Iodine	0.1	1
Iron oxide fume		10
Isocamyl acetate	100	325
Isocamyl alcohol	100	360
Isobutyl acetate	150	700
Isobutyl alcohol	100	300
Isophorone	25	140
Isopropyl acetate	350	680
Isopropyl alcohol	400	800
Isopropylamine	5	12
Isopropyl alcohol	500	2,700
Isopropyl glycidyl ether (IGES)	50	260
Ketone	0.5	0.9
Lead acetate		0.1
Lead-Skin		0.5
Lithium hydride		0.02
L.P.G. (Liquefied petroleum gas)	1,000	1,800
Magnesium oxide fume		15
Malathion-Skin		15
Maleic anhydride	0.25	5
C Manganese		100
Methyl acetate	25	100
Methanthiol, see Methyl mercaptan		
Methoxychlor		15
2-Methoxyethanol, see Methyl cellosolve		
Methyl acetate	200	610
Methyl acetylene (propyne)	1,000	1,000
Methyl acetylene-propadiene mixture (MAPP)	1,000	1,000
Methyl acrylate-Skin	10	25
Methylal (dimethoxyethane)	1,000	2,100
Methyl alcohol (methanol)	200	360
Methylamine	10	12
Methyl amyl alcohol, see Methyl isobutyl carbamate		

TABLE G-1—Continued

Substance	p.p.m.*	mg./dl.†
Methyl (n-amyl) ketone C-Hexanone	100	485
O Methyl benzoate-Skin	20	80
Methyl butyl ketone, see 2-Hexanone		
Methyl cellosolve-Skin	25	50
Methyl cellosolve acetate-Skin	25	120
Methyl chloroform	820	1,000
Methylcyclohexane	800	2,000
Methylcyclohexanol	100	470
o-Methylcyclohexanone-Skin	100	485
Methyl ethyl ketone (M.E.K., see 2-Butanone)		
Methyl formate	100	320
Methyl isobutyl-Skin	5	20
Methyl isobutyl carbinol-Skin	25	100
Methyl isobutyl ketone, see Hexone		
Methyl isocyanate-Skin	0.02	0.05
O Methyl mercaptan	10	30
Methyl methacrylate	100	470
Methyl propyl ketone, see 2-Pentanone		
O = Methyl styrene	100	485
O Methylselenobiphenyl isocyanate (M.D.I.)	0.02	0.2
Molybdenum		
Soluble compounds		5
Insoluble compounds		15
Monomethyl aniline-Skin	2	9
O Monomethyl hydrazine-Skin	0.2	0.55
Morpholine-Skin	20	70
Naphtha (naphthalene)	100	400
Naphthalene	10	80
Nickel acetylacryl	0.001	0.007
Nickel, metal and soluble compounds, as Ni		1
Nitrobenzene-Skin		5
Nitric acid		5
Nitric oxide	25	30
p-Nitroaniline-Skin	1	4
p-Nitrobenzene-Skin	1	6
p-Nitrochlorobenzene-Skin		1
Nitroethane	100	310
Nitrogen dioxide	5	5
Nitrogen trifluoride	20	80
Nitroglycerite-Skin	0.2	2
Nitromethane	100	280
1-Nitropropane	25	90
2-Nitropropane	25	90
Nitrotoluene-Skin	5	30
Nitrotrichloromethane, see Chloroform		
Octachlorocyclopentane-Skin		0.1
*Octachlorobiphenyls-Skin	500	2,500
*Oil sol. mineral		5
Oxamic lactamide		0.005
Oxalic acid		1
Oxygen difluoride	0.05	0.1
Ozone	0.1	0.2
Paracetamol-Skin		0.5
Parathion-Skin		0.1
Pentabenzene	0.005	0.01
Pentachlorobenzothialene-Skin		0.5
Pentachlorobiphenyl-Skin		0.5
*Pentane	1,000	2,500
p-Phenylenediamine	200	700
Perchloromethyl mercaptan	5	0.5
Perchloryl fluoride	5	12.5
Peroxybenzoyl chloride (naphtha)	500	2,500
Phenol-Skin	5	10
p-Phenylenediamine-Skin		0.1
Phenyl ether (vapor)	1	7
Phenyl ether-biphenyl mixture (vapor)	1	7
Phenylmethane, see Benzene		
Phenyl glycidyl ether (P.G.E.)	50	80
Phenylhydrazine-Skin	10	22
Phosgene (Chlorophosgene @)-Skin		
Phosgene (Chlorophosgene @)-Skin		0.1
Phosphoric acid	0.5	0.4
Phosphoric acid	0.5	0.4
Phosphorus (yellow)		0.1
Phosphorus pentachloride	1	1
Phosphorus pentasulfide		1
Phosphorus trichloride	0.5	5
Phthalic anhydride	2	12
Picric acid-Skin		0.1
Pinval @ (3-Pivalyl-1,3-indanone)		0.1
Platinum (Soluble Salts) as Pt		0.05
Propargyl alcohol-Skin	1	5
Propane	1,000	1,000
n-Propyl acetate	200	500
Propyl alcohol	200	500
n-Propyl nitrate	25	110
Propylene dichloride	70	280
Propylene imine-Skin	5	5
Propylene oxide	200	200
Propylene, see Methyl isobutylene		
Pyrethrum		
Pyridine	5	15
Quinone	0.1	0.4
EDX-Skin		1

TABLE 01 - Continued

Substances	p.p.m.*	mg./M ³ †
Aluminum, Metal fume and		
Gases, as Al ₂		0.1
Soluble salts		0.001
Ammonia		10
Benzenes (commercial)		5
Benzene compounds (as Bz)		0.2
Boron trifluoride	0.05	0.4
Silver, metal and soluble compounds		0.01
Sodium fluorosulfate (1000)---		
Skin		0.05
Sodium hydrosulfide		2
Urbine	0.1	0.8
Standard solvent	500	2,960
Styrene		0.15
Sulfur dioxide	5	15
Sulfur hexafluoride	1,000	8,000
Sulfuric acid		1
Sulfur monochloride		1
Sulfur pentachloride	0.025	0.25
Sulfuryl fluoride	5	20
Synone, see Demeton @		
2,4,6-T		10
Tantalum	5	5
TEDP—Skin	5	0.2
Tellurium		0.1
Tellurium hexafluoride	0.02	0.2
TEPP—Skin		0.05
O-Terphenyls	1	9
1,1,1,2-Tetrachloro-2,2-difluoroethane	500	4,170
1,1,2,2-Tetrachloro-1,2-difluoroethane	500	4,170
1,1,2,2-Tetrachloroethane—Skin	5	35
Tetrachloroethylene, see Perchloroethylene		
Tetrachloromethane, see Carbon tetrachloride		
Tetrachloronaphthalene—Skin		2
Tetraethyl lead (as Pb)—Skin		0.075
Tetrahydrofuran	200	800
Tetramethyl lead (as Pb)—Skin		0.07
Tetramethyl tinodichloride—Skin	0.5	3
Tetramethylenes	1	5
Tetrayl (2,4,6-trinitrophenyl-methyl)indimethane—Skin		1.5
Thallium (soluble compounds)—Skin as Tl		0.1
Thiram		5
TiO ₂ (inorganic compds, except oxides)		3
TiO ₂ (organic compds)		0.1
O-Tolene-2,4-dichloranate	0.05	0.15
o-Toluidine—Skin	5	22
Toxaphene, see Chlorinated camphene		
Tributyl phosphate		5
Triethyl phosphite see Methyl chloroform		
1,1,2-Trichloroethane—Skin	10	45
Trichloroethylene		15
Trichloromethane, see Chloroform		
Trichloronaphthalene—Skin		5
1,1,2-Trichloropropane	50	300
1,1,2-Trichloro-1,2,2-trifluoroethane	1,000	7,900
Trichloramine	25	100
Trichloromonobromomethane	1,000	8,100
2,4,6-Trinitrophenol, see Picric acid		
2,4,6-Trinitrophenyl-ethyl-amine, Tetryl		
Trinitrochloro—Skin		1.5
Trinitrothiophenyl phosphate		0.1
Triphenyl phosphite		3
Terpineol	100	500
Uranium (soluble compounds)		0.05
Uranium (insoluble compounds)		0.25
C Vanadium		0.5
V ₂ O ₅ dust		0.5
V ₂ O ₅ fume		4.1
Vinyl benzene, see Styrene		
Vinyl chloride	500	1,300
Vinylcyanide, see Acrylonitrile		
Vinyltoluene	100	400
Xylene	100	435
Xylylene (xylyl)	5	25
Xylylene—Skin		1
Yttrium		1
Zinc chloride fume		1
Zinc oxide fume		5
Zincium compounds (as Zn)		5

* 1970 Additions.

† Parts of vapor or gas per million parts of contained air by volume at 25° C. and 760 mm. Hg pressure.

@ Approximate milligrams of particles per cubic meter of air.

^ Not available. "a" is used to avoid confusion with solid value notation.

* As atmospheric concentration of not more than 0.05 p.p.m., or personal protective may be necessary to avoid headache.

* As sampled by method that does not collect vapor.

† For control of general room air, biologic monitoring is essential for personnel control.

TABLE G-3

Material	8-hour time-weighted average	Acceptable ceiling concentration	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hour shift	
			Concentration	Maximum duration
Benzene (Z37.4-1969)	10 p.p.m.	30 p.p.m.	50 p.p.m.	15 minutes.
Beryllium and beryllium compounds (Z37.20-1970)	3 µg./M ³	5 µg./M ³	50 µg./M ³	30 minutes.
Cadmium fume (Z37.5-1970)	0.1 mg./M ³	0.5 mg./M ³		
Cadmium dust (Z37.5-1970)	0.5 mg./M ³	0.5 mg./M ³		
Carbon disulfide (Z37.8-1968)	20 p.p.m.	20 p.p.m.	100 p.p.m.	Do.
Carbon tetrachloride (Z37.17-1967)	10 p.p.m.	20 p.p.m.	200 p.p.m.	5 minutes in any 4 hours.
Ethylene dibromide (Z37.31-1970)	20 p.p.m.	20 p.p.m.	20 p.p.m.	5 minutes.
Ethylene dichloride (Z37.31-1969)	20 p.p.m.	100 p.p.m.	200 p.p.m.	5 minutes in any 4 hours.
Formaldehyde (Z37.16-1967)	5 p.p.m.	5 p.p.m.	10 p.p.m.	30 minutes.
Hydrogen fluoride (Z37.25-1969)	1.5 mg./M ³			
Fluoride as dust (Z37.25-1969)	0.5 mg./M ³			
Lead and its inorganic compounds (Z37.13-1969)	0.5 mg./M ³			
Methyl chloride (Z37.15-1969)	100 p.p.m.	300 p.p.m.	300 p.p.m.	5 minutes in any 4 hours.
Methylene chloride (Z37.3-1969)	600 p.p.m.	1,000 p.p.m.	2,000 p.p.m.	5 minutes in any 4 hours.
Organic (alkyl) mercury (Z37.30-1969)	0.04 mg./M ³	0.04 mg./M ³		
Styrene (Z37.14-1969)	100 p.p.m.	200 p.p.m.	600 p.p.m.	5 minutes in any 4 hours.
Trichloroethylene (Z37.19-1967)	do	do	300 p.p.m.	5 minutes in any 4 hours.
Tetrachloroethylene (Z37.22-1967)	do	do	do	5 minutes in any 4 hours.
Toluene (Z37.12-1967)	200 p.p.m.	300 p.p.m.	300 p.p.m.	10 minutes.
Hydrogen sulfide (Z37.2-1968)	20 p.p.m.	20 p.p.m.	50 p.p.m.	10 minutes once only if no other measurable exposure occurs.
Magnesium (Z37.6-1971)		1 mg./10M ³		
Chromic acid and chromates (Z37.7-1971)		do		

TABLE G-3—MINERAL DUSTS

Substances	Mppcf*	Mg/M ³	Aerodynamic diameter (unit density sphere)	Percent passing selector
Fibers:			2	99
Crystalline:			2.5	99
Quartz (respirable).....	200†	10mg/M ³ =	2.5	99
	%SiO ₂ +3	%SiO ₂ +3	5.0	99
Quartz (total dust).....		10mg/M ³	10	99
		%SiO ₂ +3		99
Cristoballite: Use 1/4 the value calculated from the count or mass formulae for quartz.		%SiO ₂ +3		
Tridymite: Use 1/4 the value calculated from the formulae for quartz.				
Amorphous, including natural diatomaceous earth.....	20	10mg/M ³		
		%SiO ₂		
Silicates (less than 1% crystalline silica):				
Mica.....	20			
Soapstone.....	20			
Talc (non-asbestos-form)...	20			
Talc (fibrous). Use asbestos limit.				
Tremolite (see talc, fibrous)				
Portland cement.....	20			
Graphite (natural).....	10			
Coal dust (respirable fraction less than 5% SiO ₂).....		2.4mg/M ³ or 10mg/M ³		
For more than 5% SiO ₂		10mg/M ³		
Inert or Nuisance Dust:		%SiO ₂ +3		
Respirable fraction.....	10	10mg/M ³		
Total dust.....	20	10mg/M ³		

Note: Conversion factors—
mppcf×36 = million particles per cubic meter
= particles per c.c.

* Millions of particles per cubic foot of air, based on impinger samples counted by light-scatter technique.

† The percentage of crystalline silica in the formula is the amount determined from air-borne samples, except in those instances in which other methods have been shown to be applicable.

‡ As determined by the membrane filter method of air-phase contrast magnification.

§ Both concentration and percent quartz for the application of this limit are to be determined from the fraction passing a size-mesh with the following characteristics:

• Containing < 1% quartz; if > 1% quartz, use quartz limit.

The measurements under this note refer to the use of an AEC instrument. If the respirable fraction of dust is determined with a MIEB the figure corresponding to that of 2.4 Mg/M³ in the table for coal dust is 4.5 Mg/M³.

§ 1910.93a Asbestos.

(a) **Definitions.** For the purpose of this section, (1) "Asbestos" includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

(2) "Asbestos fibers" means asbestos fibers longer than 5 micrometers.

(b) **Permissible exposure to airborne concentrations of asbestos fibers—(1) Standard effective July 7, 1973.** The 8-hour time-weighted average airborne concentrations of asbestos fibers to which any employee may be exposed shall not exceed five fibers, longer than 5 micrometers, per cubic centimeter of air, as determined by the method prescribed in paragraph (e) of this section.

(2) **Standard effective July 1, 1976.** The 8-hour time-weighted average airborne concentrations of asbestos fibers to which any employee may be exposed shall not exceed two fibers, longer than 5 micrometers, per cubic centimeter of air, as determined by the method prescribed in paragraph (e) of this section.

(3) **Ceiling concentration.** No employee shall be exposed at any time to airborne concentrations of asbestos fibers in excess of 10 fibers, longer than 5 micrometers, per cubic centimeter of air, as determined by the method prescribed in paragraph (e) of this section.

(c) **Methods of compliance—(1) Engineering methods.** (i) **Engineering controls.** Engineering controls, such as, but not limited to, isolation, enclosure, exhaust ventilation, and dust collection, shall be used to meet the exposure limits prescribed in paragraph (b) of this section.

(ii) **Local exhaust ventilation.** (a) Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1971, which is incorporated by reference herein.

(b) See § 1910.6 concerning the availability of ANSI Z9.2-1971, and the maintenance of a historic file in connection therewith. The address of the American National Standards Institute is given in § 1910.100.

(iii) **Particular tools.** All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits prescribed in paragraph (b) of this section, such as, but not limited to, saws, scrapers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems in accordance with subdivision (ii) of this subparagraph.

(3) **Work practices—(1) Wet methods.** Insofar as practicable, asbestos shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne fibers in excess of the exposure limits prescribed in paragraph (b) of this section, unless the usefulness of the product would be diminished thereby.

(ii) **Particular products and operations.** No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, or enclosed, or ventilated so as to prevent effectively the release of airborne asbestos fibers in excess of the limits prescribed in paragraph (b) of this section.

(iii) **Spraying, demolition, or removal.** Employees engaged in the spraying of asbestos, the removal, or demolition of pipes, structures, or equipment covered or insulated with asbestos, and in the removal or demolition of asbestos insulation or coverings shall be provided with respiratory equipment in accordance with paragraph (d) (2) (iii) of this section and with special clothing in accordance with paragraph (d) (3) of this section.

(d) **Personal protective equipment—(1) Compliance with the exposure limits** prescribed by paragraph (b) of this section may not be achieved by the use of respirators or shift rotation of employees, except:

(i) During the time period necessary to install the engineering controls and to institute the work practices required by paragraph (c) of this section;

(ii) In work situations in which the methods prescribed in paragraph (c) of

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