

ASBESTOS ACGIH TLV HISTORY

YEAR	TLV	COMMENTS
1945	None*	*Maximum Allowable Concentrations of Industrial Atmospheric Contaminants, Warren A. Cook, Industrial Medicine, November, 1945, pp. 936-946. Note: This is considered the precursor of the ACGIH TLV list.
1950	5 m.p.p.c.f. (Asbestos, as "Mineral Dust")	
1951	5 m.p.p.c.f. (Asbestos, as "Mineral Dust")	
1952	5 m.p.p.c.f. (Asbestos, as "Mineral Dust")	
1953	5 m.p.p.c.f. (Asbestos as "Mineral Dust")	
1954	5 m.p.p.c.f. ¹ (Asbestos, as "Mineral Dust")	¹ m.p.p.c.f. means millions of particles per cubic foot of air.
1955	5 m.p.p.c.f. ¹ (Asbestos, as "Mineral Dust")	¹ m.p.p.c.f. means as defined in 1954 comment.
1956	5 m.p.p.c.f. ¹ (Asbestos, as "Mineral Dust")	¹ m.p.p.c.f. means as defined in 1954 comment.
1957	5 m.p.p.c.f. ¹ (Asbestos, as "Mineral Dust")	¹ m.p.p.c.f. means as defined in 1954 comment.
1958	5 m.p.p.c.f. ¹ (Asbestos, as "Mineral Dust")	¹ m.p.p.c.f. means as defined in 1954 comment.
1959	5 m.p.p.c.f. ¹ (Asbestos, as "Mineral Dust")	¹ m.p.p.c.f. means as defined in 1954 comment.
1960	5 m.p.p.c.f. ² (Asbestos, as "Silicate Mineral and Non-metallic Inorganic Dust")	² m.p.p.c.f. means millions of particles per cubic foot of air based on impinger samples counted by light-field techniques.
1961	5 m.p.p.c.f. ² (Asbestos, as "Silicate Mineral and Non-metallic Inorganic Dust")	² m.p.p.c.f. means as defined in 1960 comment.



YEAR	TLV	COMMENTS
1962	5 m.p.p.c.f. ³ (Asbestos, as "Silicate Mineral Dust", less than 1% crystalline silica)	³ m.p.p.c.f. means millions of particles per cubic foot of air, based on the standard procedure for sampling and counting dusts adopted by the Fifth Annual Meeting of ACGIH (1942).
1963	5 m.p.p.c.f. ⁴ (Asbestos, as "Silicate Mineral Dust", less than 1% crystalline silica)	⁴ m.p.p.c.f. means millions of particles per cubic foot of air, based on impinger samples counted by light-field technics.
1964	5 m.p.p.c.f. ⁴ (Asbestos, as "Silicate Mineral Dust", less than 1% crystalline silica)	⁴ m.p.p.c.f. means as defined in 1963 comment.
1965	5 m.p.p.c.f. ⁴ (Asbestos, as "Silicate Respirable Dust Evaluated by Count", less than 1% crystalline silica)	⁴ m.p.p.c.f. means as defined in 1963 comment. <u>Notice of Intended Changes:</u> Tremolite - 5 m.p.p.c.f
1966	5 m.p.p.c.f. ⁴ (Asbestos, as "Silicate Respirable Dust Evaluated by Count", less than 1% crystalline silica)	⁴ m.p.p.c.f. means as defined in 1963 comment. <u>Notice of Intended Changes:</u> Tremolite - 5 m.p.p.c.f.
1967	5 m.p.p.c.f. ⁴ (Asbestos, as "Silicate Respirable Dust Evaluated by Count", less than 1% crystalline silica) 5 m.p.p.c.f. (Tremolite, as "Silica Respirable Dust Evaluated by Count")	⁴ m.p.p.c.f. means as defined in 1963 comment.
1968	5 m.p.p.c.f. ⁴ (Asbestos, as "Silicate Mineral Dust", less than 1% crystalline silica)** 5 m.p.p.c.f. (Tremolite, as "Silica Mineral Dust")	⁴ m.p.p.c.f. means as defined in 1963 comment. <u>**Notice of Intended Change:</u> Asbestos: (a) 12 fibers/ml > 5μ in length as determined by the membrane filter method at 430X phase contrast magnification, <u>or</u> (b) 2 m.p.p.c.f. as counted by the standard impinger, light-field count technique.

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1969	5 m.p.p.c.f. ⁴ (Asbestos, as "Silicate Mineral Dust", less than 1% crystalline silica)** 5 m.p.p.c.f. (Tremolite, as "Silicate Mineral Dust", less than 1% crystalline silica)	⁴ m.p.p.c.f. means as defined in 1963 comment. <u>**Notice of Intended Changes:</u> Asbestos: As defined for 1968.
1970	5 m.p.p.c.f. ⁴ (Asbestos, all types, as "Silicate Mineral Dust", less than 1% crystalline silica)** No value assigned (Tremolite, as "Silicate Mineral Dust", less than 1% crystalline silica, see asbestos).	⁴ m.p.p.c.f. means as defined in 1963 comment. <u>**Notice of Intended Changes:</u> Asbestos: 5 fibers/ml >5 μ in length as determined by the membrane filter method at 430X magnification phase contrast illumination. Concentrations >5 fibers/ml, but not to exceed 10, may be permitted for 15-minute periods each hour up to five times daily.
1971	No value assigned (Asbestos, all types, as "Silicate Mineral Dust", less than 1% crystalline silica)** No value assigned (Tremolite, as "Silicate Mineral Dust", less than 1% crystalline silica; see Talc, fibrous; use asbestos limit).	<u>**Notice of Intended Changes:</u> Asbestos: 5 fibers/ml >5 μ in length as determined by the membrane filter method at 400-450X magnification (4 mm objective) phase contrast illumination. Concentrations 5 fibers/ml but not to exceed 10, may be permitted for 15-minute periods each hour up to five times daily.
1972	No value assigned (Asbestos, all types, as Silicate Mineral Dust", <1% quartz)** No value assigned (Tremolite, as "Silicate Mineral Dust", less than 1% crystalline silica; see Talc, fibrous; use asbestos limit).	<u>**Notice of Intended Changes:</u> Asbestos: 5 fibers/ml >5 μ in length as determined by the membrane filter method at 400-450X magnification (4 mm objective) phase contrast illumination. Concentrations 5 fibers/ml but not to exceed 10, may be permitted for 15-minute periods each hour up to five times daily; A1a (human carcinogen).

YEAR	TLV	COMMENTS										
1973	No value assigned (Asbestos, all types, as "Silicate Mineral Dust", <1% quartz)** No value assigned (Tremolite, as "Silicate Mineral Dust", <1% quartz; see Asbestos).	**Notice of Intended Changes: Asbestos: 5 fibers/cc >5 μ in length as determined by the membrane filter method at 400-450X magnification (4 mm objective) phase contrast illumination; Ala (human carcinogen). A more stringent TLV for crocidolite may be required.										
1974	5 fibers/cc >5 μm in length⁵; Ala (Asbestos, all forms, as "Silicate Mineral Dust", <1% quartz). No value assigned. (Tremolite as "Silicate Mineral Dust", <1% quartz; see Asbestos).	⁵As determined by the membrane filter method at 400-450X magnification (4 mm objective), phase contrast illumination; Ala (human carcinogen). A more stringent TLV for crocidolite may be required.										
1975	5 fibers/cc >5 μm in length⁵; Ala (Asbestos, all forms; and Tremolite, see Asbestos; as "Silicate Mineral Dusts", <1% quartz).	⁵Same comment as for 1974.										
1976	5 fibers/cc >5 μm in length⁵; Ala (Asbestos, all forms; and Tremolite, see Asbestos; as "Silicate Mineral Dusts", <1% quartz).	⁵Same comment as for 1974.										
1977	5 fibers/cc >5 μm in length⁵; Ala (Asbestos, all forms; and Tremolite, see Asbestos; as "Silicate Mineral Dusts", <1% quartz).	⁵Same comment as for 1974.										
1978	5 fibers/cc >5 μm in length⁶; Ala (Asbestos, all forms; and Tremolite, see Asbestos; as "Silicate Mineral Dusts", <1% quartz)**.	⁶As determined by the membrane filter method at 400-450X magnification (4 mm objective) phase contrast illumination; Ala (human carcinogen). **Notice of Intended Changes: Asbestos: <table><tr><td>Amosite</td><td>0.5 fiber/cc, Ala</td></tr><tr><td>Crysotile</td><td>2.0 fibers/cc, Ala</td></tr><tr><td>Crocidolite</td><td>0.2 fiber/cc, Ala</td></tr><tr><td>Tremolite</td><td>0.5 fiber/cc, Ala</td></tr><tr><td>Other forms</td><td>2.0 fibers/cc, Ala</td></tr></table>	Amosite	0.5 fiber/cc, Ala	Crysotile	2.0 fibers/cc, Ala	Crocidolite	0.2 fiber/cc, Ala	Tremolite	0.5 fiber/cc, Ala	Other forms	2.0 fibers/cc, Ala
Amosite	0.5 fiber/cc, Ala											
Crysotile	2.0 fibers/cc, Ala											
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Tremolite	0.5 fiber/cc, Ala											
Other forms	2.0 fibers/cc, Ala											

YEAR	TLV	COMMENTS
1979	5 fibers/cc >5 μ m in length ⁶ ; Ala (Asbestos, all forms; and Tremolite, see Asbestos; as "Silicate Mineral Dusts", <1% quartz)**.	⁶ Same comment as for 1978. ** <u>Notice of Intended Changes:</u> Asbestos: As defined for 1978.
1980	Amosite 0.5 fibers>5 μ m/cc,Ala Chrysotile 2.0 fibers>5 μ m/cc,Ala Crocidolite 0.2 fiber>5 μ m/cc,Ala Other forms 2.0 fibers>5 μ m/cc,Ala (Asbestos, as "Silicate Mineral Dust, <1% quartz).	Human carcinogen.
1981	Same as for 1980.	Human carcinogen.
1982	Amosite 0.5 fiber >5 μ m/cc, Ala (12172-73-5) Chrysotile 2 fibers >5 μ m/cc, Ala (12001-29-5) Crocidolite 0.2 fiber >5 μ m/cc, Ala (12001-28-4) Other forms 2 fibers >5 μ m/cc, Ala (Asbestos, as "Silicate Mineral Dust", <1% quartz)	Human carcinogen.
1983-84	Amosite 0.5 fiber >5 μ m in (12172-73-5) length ⁷ , Ala Chrysotile 2 fibers >5 μ m in (12001-29-5) length ⁷ , Ala Crocidolite 0.2 fiber >5 μ m in (12001-28-4) length ⁷ , Ala Other forms 2 fibers >5 μ m in length ⁷ , Ala (Asbestos, as "Silicate Mineral Dust", <1% quartz)	Human carcinogen. ⁷ As determined by the membrane filter method at 400-450X magnification (4 mm objective) phase contrast illumination.
1984-85	Amosite 0.5 fiber/cc >5 μ m in (12172-73-5) length ⁷ , Ala Chrysotile 2 fibers/cc >5 μ m in (12001-29-5) length ⁷ , Ala Crocidolite 0.2 fiber/cc >5 μ m in (12001-28-4) length ⁷ , Ala Other forms 2 fibers/cc >5 μ m in length ⁷ , Ala (Asbestos, as "Silicate Mineral Dust", <1% quartz)	Same comments as for 1983-84.

1985-86 Amosite 0.5 fiber/cc⁸, Ala
(12172-73-5)
Chrysotile 2 fibers/cc⁸, Ala
(12001-29-5)
Crocidolite 0.2 fiber/cc⁸, Ala
(12001-28-4)
Other forms 2 fibers/cc⁸, Ala
(Asbestos, as "Silicate and
Other Dust", <1% quartz).

⁸As determined by the membrane filter
method at 400-450X magnification
(4 mm objective) phase contrast
illumination for fibers longer than
5 μ m and with an aspect ratio equal
to or greater than 3:1; human
carcinogen.

1986-87 Same as for 1985-86.

Same comments as for 1985-86.

Conversion

m.p.p.c.f. X 35.3 = particles/cc

1 cc = 1 ml

35.3 ft³ = 1 m³

Definition (1986-87)

Ala. Human Carcinogens. Substances, or substances associated with industrial processes, recognized to have carcinogenic or cocarcinogenic potential, with an assigned TLV.

1986

TEXAS CITY PLANT

FOLLOW-UP

INDUSTRIAL HYGIENE PROGRAM EVALUATION

February 25-26, 1986

L. W. O'Farrell
S. D. Paul

INTRODUCTION

Background

Throughout Monsanto, there is a concerted effort to develop and maintain quality plant industrial hygiene programs to reduce employee exposure to chemical, physical, and biological agents which may produce adverse health effects. Plant IH programs reflect specific plant needs and are in various stages of development. DMEH has a responsibility to evaluate these programs on a continuing basis and to recommend elements or strategies that promote complete program development and maintenance.

Purpose

This 1986 Follow-up IH Evaluation Report presents the current status of the Texas City Plant response to comments and recommendations in the 1984 Follow-up IH Program Evaluation Report and includes other specific items as appropriate.

Scope

Recommendations are made to minimize the differences between current program capabilities and perceived plant needs. The following criteria were evaluated for the 1986 Texas City Plant IH program.

- I. General Information
- II. Organization/Staffing and Budget
- III. Employee Education, Training, and Communication
- IV. Contractor Employees
- V. Industrial Hygiene/Occupational Medicine Interface
- VI. Inventory Control of Chemical/Physical Agents
- VII. Exposure Assessment
- VIII. Monitoring Data Integrity
- IX. Engineering Control Implementation and Evaluation
- X. Data Handling and Reporting
- XI. Hearing Conservation Program
- XII. Respiratory Protection Program
- XIII. Personal Protective Equipment Program
- XIV. Radiation and Heat Stress
- XV. Hygiene Facilities and Practices
- XVI. Emergency Response

EXECUTIVE SUMMARY

The 1986 follow-up IH evaluation generally indicates that the overall plant program is very good. Technical program aspects are typically handled very well. Communications, training, and participative aspects have significantly improved since 1984. A desirable goal in the near future is to find a way to administer the program while providing ample time to remain visible in the plant on a routine basis. The two roles are often at odds

and may make the industrial hygienist uncomfortable with overall performance in both phases of the job. There is no question, however, that May Caban has done an excellent job.

In the near future, principal thrust areas should include hazard communication, employee training, exposure assessment (e.g., benzene) and respiratory protection. This is based on new or proposed regulatory changes and the impact of these changes on plant operating personnel.

The recommendations in this report are prioritized to assist you to identify the areas to address first. Priority I recommendations should be addressed immediately. Priority II recommendations should be addressed within 6 months. Priority III recommendations should be addressed within 12 months. Priority IV recommendations should be addressed within 24 months.

The recommendations are intended to be specific enough to provide definition, but general enough not to restrict the approach to problem solving.

Some of the recommendations suggest that an integrated approach be used to respond to this report. It will be helpful to consider such an approach when appropriate.

COMMENTS/RECOMMENDATIONS

The following comments present a status of the Texas City Plant IH program at the time of the evaluation. The recommendations are intended to be used to identify future industrial hygiene action areas.