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PLAINTIFF'S EXHIBIT

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OSHA
FIELD OPERATIONS MANUAL
and
INDUSTRIAL HYGIENE
FIELD OPERATIONS MANUAL

United States Department of Labor
Occupational Safety and Health Administration

Text of Manuals With Amendments
Through January 1, 1979

Compliance guidelines for
the Occupational Safety and Health Act of 1970

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CHAPTER IX

DETERMINATION OF COMPLIANCE FOR AIR QUALITY AND NOISE STANDARDS

[¶ 4487.30]

The Occupational Safety and Health Administration determines compliance for air quality (and noise) standards based upon one or more days full-shift time weighted average concentration measurements and professional judgement of the data and conditions that exist at the plant. The following conditions must be met before citations are issued against air quality standards 1910.1000 and 1910.1001 and noise standard 1910.95 as applicable.

1. An exposure to an employee must occur. This requires the use of personal sampling techniques.

2. For 8-hour exposures, the time weighted average concentration must be determined. Sampling devices that monitor full-shift exposures must operate for a minimum of 7 hours. This implies that the concentration is calculated, using the air volume sampled during the shift as long as the sampling time exceeds 7 hours. Spot samples must be taken throughout the work shift to represent at least 7 hours of exposure and to represent periods of exposure for time weighted average calculations. When the actual work shift exceeds 8 hours, an 8 hour time weighted average must be calculated using the results of a 7 or 8 hour sampling period. This value is compared to the standard for compliance determination.

3. Materials in Table Z-1 of standard 1910.1000 preceded by a "C" have maximum peak ceiling limits which are never to be exceeded to which an employee can be exposed. Generally a 15-minute sampling period should be applied to ceiling measurements (except for imminent danger situations where immediate escape from the atmosphere is necessary).

4. Materials in Table Z-2 of standard 1910.1000 have maximum peak ceiling limits plus ceiling limits with permissible exposure times. The maximum peak ceiling limits are, in effect, the ceiling limits with permissible exposure times. Generally a 15-minute period of samples are required to sample accurately. Exceptions are beryllium and formaldehyde which have 30 minute maximum duration limits for the acceptable ceiling concentrations. The other exceptions are imminent danger situations where immediate escape from the atmosphere is necessary.

5. The 8-hour time weighted average applies to any 8-hour shift of the work week.

6. The cumulative exposure computation formula must be and shall only be used for materials that have additive harmful effects on the human body. A complete list of contaminants having additive effects is shown in Figure 1.

7. A minimum one seven to eight-hour sample for full-shift assessment, several spot samples that represent on a time weighted average a full-shift assessment, or one 15-minute sample for a ceiling assessment are the basis of issuing a citation. The measurement(s) must exceed the allowable limits by the statistical factor for that method of measurement shown in Table 2. This concept is discussed in more detail below.

8. All industrial hygiene samples must be collected and analyzed using OSHA standard methods.

9. The citation will not be issued on the results of the sampling alone. Professional judgement of the data and conditions must confirm the sampling results. The following are guidelines to be weighed.

(1) The CSHO (I.H.) past experience must indicate that the sampling results are consistent with observation of the worksite.

(2) The sampling results in the plant should correlate with each other. For example, does the occupation that is expected to be dusty have higher dust concentrations measured than those expected to be less dusty.

(3) The sampling results should reasonably correlate with previous measurements made by OSHA, the company, or labor, taking into account variations due to weather, production, breakdowns, etc.

10. Ventilation measurements should be consistent with sampling results and should indicate inadequate controls.

11. Swipe sampling results are used as a general indication of housekeeping, air quality and exposure. The results of swipe samples shall not be a quantitative measurement of compliance, but an indicator, such as an area air quality sample.

12. A representative number of employees with the highest exposure must be sampled. The area sampling should be sufficient to define the environment, the unit operation or unit process under investigation for identification of sources.

13. Although it is not essential that the CSHO and I.H. continuously observe each employee being monitored, the CSHO and I.H. must account for each employee's movements and duties in each area of the plant. The CSHO and I.H. shall remain at the workplaces while the samples are being collected. Areas in which personnel that are being monitored work must be surveyed during the walkaround and representative area samples collected.

14. Each personal exposure sampling device must be checked at least every two hours. Employee movements, job descriptions while working in each area (including the time the employee works out of sight) and checks on equipment shall be written in the inspection notes.

15. As a rough guide, one industrial hygienist should be able to collect at least 5 full-shift personnel samples and 5 full-shift area samples per day.

16. The factors to be applied to full-shift time weighted average concentrations have been developed because legal considerations require a degree of certainty that the standard is violated when a citation is issued. A citation shall not be issued unless the permissible levels are exceeded by the factor listed in Table 2 based upon a single day's sampling results.

The employee must also be protected. Therefore, the factor can be applied to the allowable limits to determine a lower limit. Measurements below the limit indicate with certainty that overexposure did not occur.

17. If measurements fall in the range between the lower limit and upper limit where no decision regarding compliance can be made, additional samples shall be collected until a decision can be reached.

When inconsistencies exist in the data as evaluated in 9 and 10, additional samples shall be collected until a decision can be reached.

No more than five replicate samples should be taken of any time weighted average measurement.

Table 2 Facto
ensure the allowab

Measurement
Total Dust-Gravim
Metal Dust and Me
Respirable Silica D
Charcoal Tube (8-h
Noise (Dosimeter)
Impinger or Bubble
Detector Tube (8-h
Detector Tube (Cei

Note: Detecto
unless special allow

Table 2 Factors to be applied to full-shift time weighted average concentrations to ensure the allowable limits have been exceeded.

Measurement	*Factor*
Total Dust-Gravimetric	1.10
Metal Dust and Metal Fume	1.15
Respirable Silica Dust	1.25
Charcoal Tube (8-hour TWA)	1.15
Noise (Dosimeter)	1.30
Impinger or Bubbler (8-hour TWA)	1.15
Detector Tube (8-hour TWA)	1.30
Detector Tube (Ceiling)	1.30

Note: Detector tubes are not to be used for compliance with 8-hour exposure unless special allowances are made by the National Office.

HEALTH HAZARD CLASSIFICATION	MD	FIELD CODE	SUBSTANCE	PHY ST	OSHA PEL PPM	OSHA PEL MG/M3	ACGIH PEL PPM	ACGIH PEL MG/M3	HEALTH HAZARD CATEGORY	HEALTH HAZARD CLASSIFICATION
1=UP TO 3XPEL 5=ABOVE 3XPEL	15	0175	AMMONIUM CHLORIDE	S	NONE	NONE	A -	10	MILD IRRITATION - EYE, NOSE, THROAT	0
5=AT CURRENT OSHA PEL OF 10 PPM	15	0185	AMMONIUM SULFAMATE	S	-	15	A -	10	MILD IRRITATION - EYE, NOSE, THROAT	0
1=UP TO 3XPEL 5=ABOVE 3XPEL	14	0190	N-AMYL ACETATE	L	100	525	100	525	MODERATE IRRITATION- EYE, NOSE, THROAT	0=UP TO 2XPEL 5=ABOVE 2XPEL
5= ABOVE 5 PPM	14	0191	AMYL ACETATE-SEC	L	125	650	125	650	MODERATE IRRITATION- EYE, NOSE, THROAT	0=UP TO 2XPEL 5=ABOVE 2XPEL
3= UP TO 3XPEL 5= ABOVE 3XPEL	12	0220	ANILINE - SKIN	L	5	19	5	19	METHEMOGLOBIN FORMATION/ACUTE TOXIC (SYSTEMIC) EFFECTS	0=UP TO 2XPEL 5=ABOVE 2XPEL
	3	0225	ANISIDINE (O,P - ISOMERS)	L	-	0.5	-	0.5	METHEMOGLOBIN FORMATION/CUMULATIVE TOXICITY	0=UP TO 3XPEL 5=ABOVE 3XPEL
	3	0230	ANTIMONY & COMPOUNDS (AS SB)	S	-	0.5	P HGBL,S:PROD	.05	CUMULATIVE LIVER AND HEART DAMAGE	5
5=BELOW 5000 PPM 5=ABOVE 5000 PPM	3	0235	ANTU (ALPHA NAPHTHYL THIOUREA)	S	-	0.3	-	0.3	CUMULATIVE ENDOCRINE (THYROID AND ADRENAL) DAMAGE	5
	16	0240	ARGON	G	NONE	NONE	A P	-	SIMPLE ASPHYXIATION	0=IF OXYGEN IS GREATER THAN 19% BY VOL
	2	0260	ARSENIC & COMPOUNDS (AS AS)	S	-	0.5	P HGBL .25:PROD	.05	CUMULATIVE SYSTEMIC POISON/SUSPECT CARCINOGEN	5
	4	0270	ARSINE	G	0.05	0.2	0.04	0.2	ACUTE SYSTEMIC TOXICITY	5
	1	9020	ASBESTOS (ALL FORMS)	S	STD 1910.1001		2 FIBERS/CC		ASBESTIOSIS/CANCER	5
	2	0290	ASPHALT (PETROLEUM) FUMES	FUM	NONE	NONE	A -	5	GOOD HOUSEKEEPING PRACTICE/SUSPECT CARCINOGEN	5
	5	P0300	AZINPHOS METHYL-SKIN	S	-	0.2	-	0.2	CHOLINESTERASE INHIBITION	0=UP TO 3XPEL 5=ABOVE 3XPEL
	3	0310	BARIUM (SOLUBLE COMPOUNDS)	S	-	0.5	-	0.5	CUMULATIVE HEART+ LUNG, & BRAIN DAMAGE	5
	5	____	BAYGON (PROPOXUR)	S	NONE	NONE	A -	0.5	CHOLINESTERASE INHIBITION	0=UP TO 10XPEL 5=ABOVE 10XPEL
	2	0320	BENZENE - SKIN	L	10	30	10A2	30	CUMULATIVE BONE MARROW DAMAGE/ SUSPECT LEUKEMOGEN	5
	1	C0330	BENZIDINE - SKIN	S	STD 1910.1010		A	10	CANCER OF BLADDER	5
	2	0335	BENZOYL PEROXIDE	S	-	5	-	5	MODERATE IRRITATION EYE, NOSE, THROAT/ SUSPECT CARCINOGEN	5
	2	0340	BENZYL CHLORIDE	L	1	5	1	5	MARKED IRRITATION - EYE, NOSE, THROAT/ SUSPECT CARCINOGEN	5
	2	0360	BERYLLIUM AND COMPOUNDS	S	-	0.002	-	0.002	CUMULATIVE LUNG DAMAGE (BERYLLIOSIS) /SUSPECT CARCINOGEN	5
	1	C1020	BETA-NAPHTHYLAMINE	S	STD 1910.1009		A10	-	CANCER-BLADDER	5
	1	C2163	BETA-PROPIOLACTONE	L	STD 1910.1013		A 2	-	ACUTE SYSTEMIC TOXICITY (HIGH)/ CANCER	5
5=ABOVE CEILING LIMIT	14	1011	BIPHENYL (DIPHENYL)	S	0.2	1	0.2	1	MODERATE IRRITATION EYE, NOSE, THROAT, LUNGS	0=UP TO 3XPEL 5=ABOVE 3XPEL
	1	C2630	BIS-CHLOROMETHYL ETHER	L	STD 1910.1006		A1A	-	CANCER (LUNG)	5
3=UP TO 3XPEL 5=ABOVE 3XPEL	17	0370	BISMUTH TELLURIDE	S	NONE	NONE	A -	10	"INERT" PARTICULATE (ACCUMULATION IN LUNGS)	0
5=ABOVE 25 PPM										