

INDUSTRIAL HYGIENE REPORT

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AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

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TITLE:

EVALUATION OF WELDING FUMES AND TOTAL PARTICULATES AT THE DENVER EXTRUSION PLANT IN
AUGUST, 1990

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SUMMARY

Personal and area exposures to welding fumes and total particulates were evaluated in August, 1990, for employees working in the Denver Extrusion Plant at the new retorquer welding station. Results of the eight components analyzed for welding fumes (welding fume total particulates, iron oxide fume as iron, copper, lead, manganese, nickel, molybdenum, and chrome), were found to be within acceptable limits.

Local ventilation was established for this welding operation. Capture efficiency of visible particulates was very good.

It is recommended that employees be informed of these sampling results and this documentation be sent to Industrial Hygiene Services for inclusion within the seventy-five year retention files.

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EVALUATION OF WELDING FUMES AT
AT DENVER EXTRUSION PLANT, AUGUST, 1990

EVALUATION CRITERIA

Industrial Hygiene monitoring is performed to evaluate potential exposure levels to employees both as a daily time-weighted average (TWA) and peak or short-term exposures. The results of the monitoring are compared with the recommended exposure guidelines. The values are based on toxicology data and Industrial Hygiene experience.

<u>Agent</u>	<u>Exposure Guideline</u>	<u>Source*</u>
Welding fumes total particulate	5 mg/m ³	ACGIH-TLV
Iron oxide fume as iron	5 mg/m ³	ACGIH-TLV
	10 mg/m ³	OSHA-PEL
Copper fume	0.2 mg/m ³	ACGIH-TLV
	0.1 mg/m ³	OSHA-PEL
Lead	0.15 mg/m ³	ACGIH-TLV
	0.05 mg/m ³	OSHA-PEL
Manganese	5 mg/m ³ (C1)	OSHA-PEL
Fume	1 mg/m ³	ACGIH-TLV
	3 mg/m ³ (STEL 2)	
Nickel	1 mg/m ³	ACGIH-TLV
	1 mg/m ³	OSHA-PEL
Molybdenum	5 mg/m ³	ACGIH-TLV
	5 mg/m ³	OSHA-PEL
Chromium	1 mg/m ³	OSHA-PEL
	0.5 mg/m ³	ACGIH-TLV
Total Particulate	10 mg/m ³	OSHA-PEL
	10 mg/m ³	ACGIH-TLV

*ACGIH-TLV - American Conference of Governmental Industrial Hygienists
Threshold Limit Value

OSHA-PEL - Occupational Safety and Health Administration
Permissible Exposure Limit

(STEL 2) - Short-Term Exposure Limit - A 15-minute time-weighted average exposure which should not be exceeded at any time during a work day even if the eight-hour time-weighted average is within the TLV.

(C1) - Ceiling Value - An employee's exposure to this material shall at no time exceed the ceiling value given for that material.

TABLE I
SUMMARY OF INDIVIDUAL AND AREA EIGHT-HOUR TIME-WEIGHTED
MONITORING - DENVER EXTRUSION

JOB CLASSIFICATION/AREA	MASTER #/ SOC. SEC. #	SAMPLE NUMBER	DATE	SAMPLE TIME MIN.	TOTAL PARTICULATE	8-HOUR TWA TWA EXPOSURES MG/M3						
						Mo	Cr	Ni	Fe	Mn	Cu	Pb
Area-on retorque Station B stand - 3' from weld area		3342B	8-8-90	480	0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
Unit Tech - Fabrication	831496	2799-C-C	8-7-90	375	0.008	<0.001	<0.001	<0.001	0.009	0.001	<0.001	<0.001
Area-on retorque Station B stand - 2' from weld area		3238-C	8-8-90	480	0.004	<0.001	<0.001	<0.001	0.007	<0.001	<0.001	<0.001
Area-on desk 10' from weld area		3238-D	8-7-90	370	0.009	<0.001	0.005	0.015	0.032	0.053	<0.001	<0.001
Area-on retorque Station B stand - 3' from weld area		3342-D	8-7-90	375	0.005	<0.001	<0.001	<0.001	0.023	0.003	<0.001	<0.001
Unit Tech - Fabrication	831482	3342-C	8-8-90	480	0.015	<0.001	0.002	0.016	0.008	0.001	<0.001	<0.001
Area-on retorque Station B stand - 1' from weld area		2100-C-D	8-7-90	375	0.050	<0.001	<0.001	<0.001	0.038	0.006	<0.001	<0.001
General Contractor - Fabrication	196-58-5830	2799-C-D	8-8-90	480	0.024	<0.001	<0.001	0.001	0.008	0.001	<0.001	<0.001

Welding fumes were collected using calibrated Gillian HFSS13 air sampling pumps set at 2.0 lpm. A known volume of air was pulled through a pre-weighed 37mm, 0.8 micron pore size Gelman GA-4 membrane filter. After the filter's weight gain was determined, the filters were sent to Analytical Services (with blanks) for emission spectroscopy.

<indicates less than (analytical) sensitivity of 1 ug)

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