



The Industrial Commission
Of Ohio
Division Of Safety & Hygiene
246 N. High St., Col. O. 43215

October 25, 1984

Ms. Judy Spencer
Legal Section
Industrial Commission of Ohio
246 North High Street
Columbus, Ohio 43215

Re: OD 21247-22
Robert Hinaman
~~General Motors Corp.~~
Fisher Body Division
2525 W. 4th Street
Mansfield, Ohio

Dear Ms. Spencer:

A visit was made to the above location to investigate this claim.

The claimant, age 52, alleges chronic obstructive pulmonary disease due to cast iron dust from a machining operation. The facsimile file contains his medical history, including a smoking history of 2 packs per day over the years.

The claimant was hired as a skilled trades machinist on August 11, 1958 and was listed as a Keller Operator on December 10, 1973. The last day worked was September 2, 1983. He was on sick leave from September 12, 1983 until his disability retirement on September 1, 1984.

A Keller is a large horizontal profiling machine which duplicates a die from a wood template. A 12-inch long by 3-inch diameter fluted cutter operated at low speed generates 1/16" x 3" metal cuttings. The remaining Keller uses water-based coolant sprayed on the part being machined. There were no visible emissions from this operation. There is currently only one Keller, the others have been removed during plant modernization. Reportedly all of the machinists in this area of the tool room are classified as Keller Operators. They rotate positions every five or six weeks.

The rail mills and bar mill use both fluted cutters and carbide tipped rotary head cutters (without coolant) to machine flat surfaces in the cast iron dies to be used in stamping of automobile body panels.

The fluted cutters produce relatively large metal chips. Horizontal milling with rotary cutters produced 1 millimeter x 1 millimeter metal cuttings. The bar mill had a considerable amount of down time during the survey due to mechanical problems.

Vertical face milling (rail mill #1 and #3) at 60 to 80 rpm occasionally produced a fine 2 to 18 inch diameter dust cloud at the cutting head, when making 5 inch by 5 inch cut 1/8 inch deep on a top post. Bottom facing (rail mill #4) generated a dense smoky cloud of iron particulate about 1 to 3 feet in diameter, the operator normally stays several feet away at the control pendant but occasionally went within 18 inches to observe the cut. The metallic taste of iron could be sensed when this close. The dust dissipated within 30 seconds. Bottom facing apparently generates more iron dust because it is a larger, continuous cut.

Breathing zone air samples for total particulate and iron dust were obtained using MSA Model G pumps and 5.0 micron PVC filters. Analysis was performed by an AIHA accredited laboratory. Sample data listed in Table #1 is below the respective ACGIH Threshold Limit Values.

Threshold Limit Values refer to airborne concentrations of substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect. Because of wide variations in individual susceptibility, however, a small percentage of workers may experience discomfort from some substances at concentrations at or below the threshold limit; a smaller percentage may be affected more seriously by aggravation of a pre-existing condition or by development of an occupational illness. The TLV-TWA should be used as guides in the control of health hazards and should not be used as fine lines between safe and dangerous concentrations.

Inhalation of iron oxide fume or dust causes a benign pneumoconiosis (siderosis).¹ The TLV of 5 mg/M³ was set at a level to prevent the development of x-ray changes in the lungs on long-term exposure.

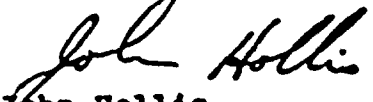
Silicon carbide (TLV: 10 mg/M³ as total dust) is classified as a nuisance particulate. In contrast to fibrogenic dusts which cause scar tissue to be formed in lungs when inhaled in excessive amounts, so-called "nuisance" dusts have a long history of little adverse effect on lungs and do not produce significant organic disease or toxic effect when exposures are kept under reasonable control. The nuisance dusts have also been called (biologically) "inert" dusts, but the latter term is inappropriate to the extent that there is no dust which does not evoke some cellular response in the lung when inhaled in sufficient amount. However, the lung-tissue reaction caused by inhalation of nuisance dusts has the following characteristics: (1) The architecture of the air spaces remains intact. (2) Collagen (scar tissue) is not formed to a significant extent. (3) The tissue reaction is potentially reversible.

Mr. R. Leedom of Fisher Body provided data from personal sampling performed in the tool room on April 24, 1980: Surface grinder 1.2 mg/M³ Total Particulate; Cutter grinder 0.6 mg/M³ Total Particulate.

There is a clear relationship between the presence of chronic obstructive lung disease and a prior history of smoking.²

In conclusion: (1) inhalation of excessive concentrations of iron dust can produce a benign pneumoconiosis, (2) sampling data indicates that even though visible emissions were present, the concentrations were below the respective Threshold Limit Values on the data of the survey.

Sincerely,


John Hollis
Industrial Hygienist

JH/rr

Enclosure: Test Table #1

References:

1. Proctor M.H., Chemical Hazards of the Workplace, Lippincott 1978.
2. DHEW Publication 79-50066, Smoking and Health: A Report of the Surgeon General.

General Motors Corp.
Fisher Body,
Mansfield, Ohio

TABLE 1

DATE	NAME	JOB/OPERATION	CONTAMINANT	EXPOSURE TWA mg/m ³	ACGIH TLV mg/m ³
9-13-84	Lloyd Coder	Keller Operator Horizontal, cast iron	Total Particulate Iron (dust)	0.27 0.046	10.0 5.0
	Gerald Falter	Rail Mill #1 Vertical, cast iron	Total Particulate Iron (dust)	0.24 0.048	10.0 5.0
	Virgil Wurth	Rail Mill #4 Vertical, cast iron	Total Particulate Iron (dust)	2.2 0.78	10.0 5.0
	Martin Harvath	Rail Mill #3 Vertical, cast iron	Total Particulate Iron (dust)	0.25 0.044	10.0 5.0
	Leonard Elam	Bar Mill Horizontal, cast iron	Total Particulate Iron (dust)	0.11 0.017	10.0 5.0

TWA Time Weighted Average
TLV Threshold Limit Value
ACGIH American Conference of Governmental
Industrial Hygienists
* Occupational Safety and Health
Administration (OSHA)
** National Institute for Occupational Safety
and Health (NIOSH) TLV

ppm Parts per million parts of air
mg/m³ Milligrams per cubic meter of air
dBA decibels A scale
ND None detected
(STEL) Short Term Exposure Limit