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NATLSCO

November 5, 1986

Mr. Craig Mountz
Project Engineer
Ammco Tools
Wacker Park
North Chicago, Illinois 60064

Dear Mr. Mountz:

Attached is the report of the industrial hygiene study conducted at the above location in the training center on October 2, 1986.

I would like to thank you and Mr. Ben Darda for your time and assistance with this study.

As we discussed during the study, a good method to keep informed of new OSHA laws affecting general industry would be through a subscription service. The one service I am familiar with is the Bureau of National Affairs. I am enclosing the ad for the BNA. There are probably a number of services on the market which could be found in any safety journal or by contacting the National Safety Council, Chicago, Illinois.

If there are any questions concerning this report or if we can be of further service to you, please contact me.

Very truly yours,

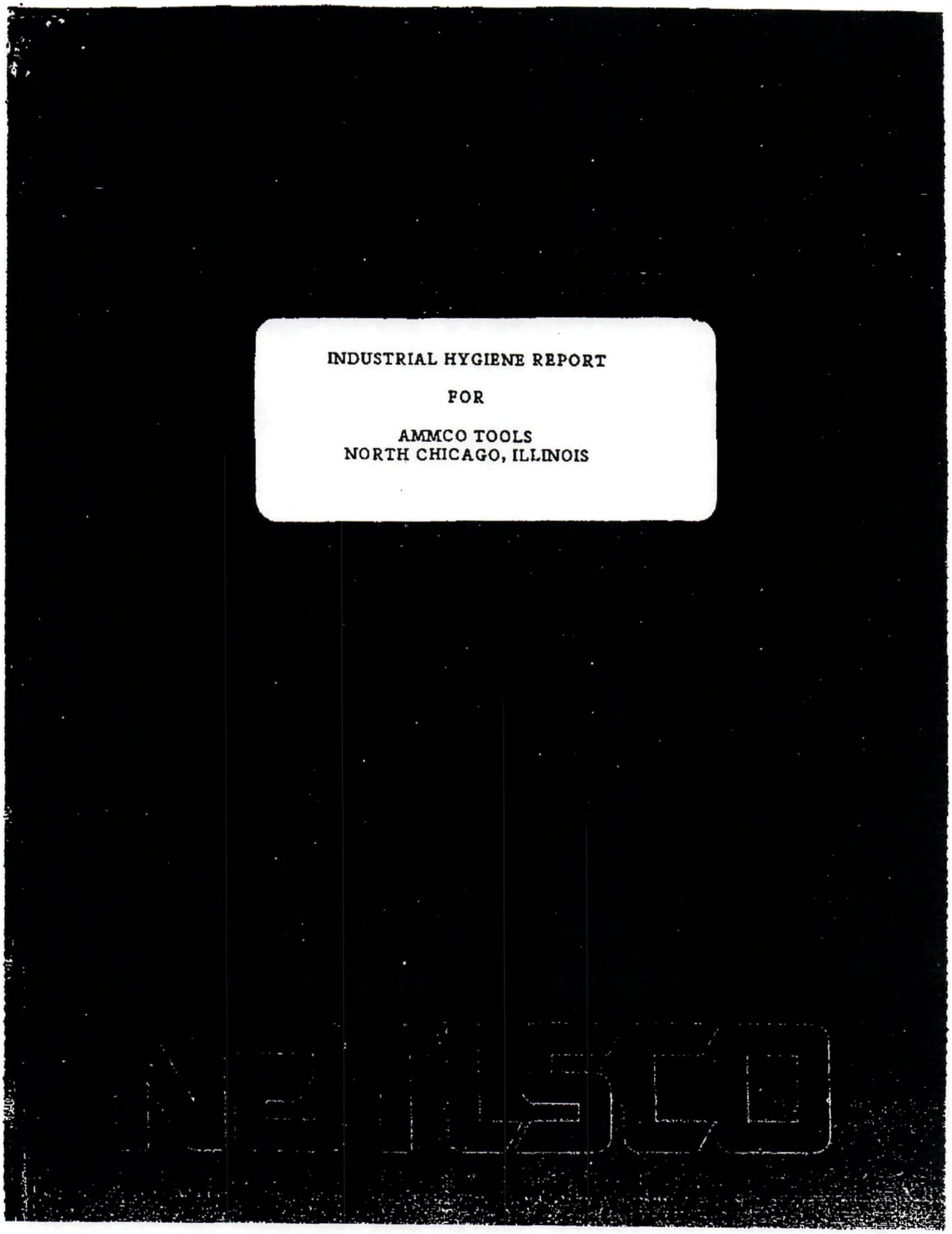
Laurie B. Corsi
Industrial Hygienist
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INDUSTRIAL HYGIENE REPORT

FOR

AMMCO TOOLS
NORTH CHICAGO, ILLINOIS



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NATLSCO

INDUSTRIAL HYGIENE REPORT

FOR

AMMCO TOOLS
NORTH CHICAGO, ILLINOIS

National Loss Control Service Corporation
Long Grove, Illinois 60049-0075 (312) 540-2400 TWX (910) 651-3571 Toll Free 800-323-9585

INDUSTRIAL HYGIENE REPORT

FOR

AMMCO TOOLS
NORTH CHICAGO, ILLINOIS

The purpose of this NATLSCO Industrial Hygiene study and report is to assist you, the client, in your responsibility to establish and maintain a loss control program to prevent illness and injury to your employees and others. NATLSCO's activities and recommendations are a supplement to, and not a substitute for, any part of your own responsibilities and activities. These NATLSCO services are based upon information supplied by client management and conditions that are readily observable, and should not be relied upon exclusively to prevent all possible illnesses, injuries or losses.

INTRODUCTION

This is the report of the Industrial Hygiene study conducted at this plant in the training center on October 2, 1986. The purpose of the study was to:

Measure employee exposures to airborne substances at specific operations as detailed in the table in the SUMMARY OF RESULTS section of this report.

Measure general area concentrations of airborne substances at specific operations as detailed in the table in the SUMMARY OF RESULTS section of this report.

The data presented in this report represent conditions existing at this location on the day of this study.

SUMMARY OF RESULTS

Detailed results of this study may be found in the attached tables at the end of this report.

Employee exposures to airborne substances expressed as a percentage of the OSHA Permissible Exposure Limit (PEL) and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) were as shown below.

An exposure which is greater than 100% of the PEL or TLV is excessive.

DEPARTMENT/LOCATION	CONTAMINANT	% of PEL	% of TLV
Brake removal, washing, grinding and reassembly	asbestos	85-115	8.5-11.5
Washing brakes only	asbestos	<5.0	<1.0
Grinding shoes only	asbestos	240	24
General area sample/removal washing, and reassembly, no grinding	asbestos	<5.0	<1.0
General area sample/removal washing, and reassembly and grinding in background	asbestos	<5.0	<1.0
General area sample/removal front disc brakes without washing, etc., no grinding	asbestos	<5.0	<1.0
General area sample/bag collection system		15-45	1.5-4.5

The study was conducted in the new training center facility which consists of seven bay areas. The heating/air conditioning system was in operation during this study.

Removal and replacement with ground brake shoes was done on a 1984 K-5 Blazer. This vehicle was equipped with brake drums in the rear and disc brakes in the front. This vehicle was used for all samples 18-723 through 18-728.

Removal, washing, wire brushing, and reassembly operations were conducted on a 1966 Dodge Coronet. No grinding of shoes was performed during this sampling period. Only rear brake drums were removed. This vehicle was used for sample 18-729.

Washing operations were conducted using the AMMCO Washer Model 1250 and grinding was conducted with the AMMCO Grinder 8000. Brake washer cleaner Pt# SP-20972--P & G 60442--Product #1256 was utilized in the washer system during this study.

RECOMMENDATIONS

The following recommendations are made in accordance with the Federal OSHA Asbestos Standard 1910.1001.

These recommendations are only the major points of this standard, therefore, the standard should be used as a source of the other requirements.

1. Further engineering controls should be investigated for the AMMCO Grinder 8000 since all exposures during grinding operations were found to be in excess of the new OSHA Permissible Exposure Limit. This fact is noted in samples 18-726 and, 18-730 which were sampling periods for grinding operations only.

2. Until such time as engineering and/or administrative controls can reduce excessive employee exposure to asbestos to below the new OSHA Permissible Exposure Limits, employees should be issued and required to wear NIOSH/MSHA approved respirators, affording protection against asbestos when conducting total brake removals and grinding shoes.

3. The metal pans used under the brake drum to catch wetted material should be cleaned after each use. The material on these trays should be considered contaminated with asbestos; thus, proper disposal methods according to the Federal Register 1910.1001 should be followed.

4. Disposable type cloths should be used instead of cloths requiring laundering, since the cloths are considered to be contaminated with asbestos from wiping down the brake parts. If laundered cloths are used, the laundry facility will need to be notified in writing according to OSHA Regulation 1910.1001.

EQUIPMENT AND STUDY PROCEDURES

Breathing zone samples were collected by attaching the sampler in the "breathing zone" of the operator(s) being monitored. The "breathing zone" is defined as a hemisphere two feet in diameter centered on and in front of the employee's head.

Asbestos samples were collected on 37mm and/or 25mm mixed cellulose ester membrane filters with the outer face cap of the filter cassette removed using MSA Model G or S Pumps. 37mm filters were used for general area monitoring and 25mm filters for personal sampling. Samples were collected at a flow rate of 2.0 liters per minute for the time periods reported in Table I. The air flow rate through each filter was checked before, during, and after the sampling period with a filter in line using a Brooks precision rotameter, inventory number 12 . Samples were counted for fibers greater than five micrometers in length and with a length to width ratio of at least three to one using phase contrast illumination at 450X magnification in accordance with the requirements of OSHA 29CFR 1910.1001.

Sample flow rates were initially set and periodically checked during the sampling periods with a Brooks Precision Rotameter (Laboratory inventory number 12 - high flow). This rotameter was calibrated against a bubble flow meter, which is a primary standard.

All samples for laboratory analysis collected during this study were submitted for analysis to the NATLSCO Environmental Sciences Laboratory, which is accredited by the American Industrial Hygiene Association.

Where two or more samples were collected to evaluate an employee's exposure, the time weighted average exposure was determined from the formula:

$$TWAE = \frac{C_1T_1 + C_2T_2 + \ldots C_nT_n}{Ts}$$

Where C_1 denotes the concentration of contaminant number 1 during time period T_1, and Ts is the total duration of sampling ($T1 + T2 + \ldots Tn$).

OSHA Permissible Exposure Limits are taken from the OSHA Safety and Health Standards 29 CFR 1910.1001.

TLV's refer to the American Conference of Governmental Industrial Hygienists "Threshold Limit Values for Chemical Substances and Physical Agents in the Workroom Environment" 1986-87 Edition. The TLV's, according to the Preface of the above publication, refer to air concentrations of substances which "represent conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse effect". The ACGIH also states that their TLV's are intended to be applied only by persons trained in industrial hygiene and used in the control of occupational health hazards, and that they should not be used as fine lines between safe and unsafe conditions.

DISCUSSION

The new OSHA Asbestos Standard 1910.1001 became effective July 21, 1986. However, it should be noted that the following sections of that standard have been stayed by the Office of Management and Budget. They are:

(d)(2)
(d)(3)
(d)(5)
(d)(7)
(f)(2)
(g)(3)(i)
(j)(5)
(l)
(m)

Please refer to the enclosed copy of 1910.1001 for further requirements of the asbestos standard.

Through discussion with the senior training instructor, it was determined that the following conditions exist for clients that utilize the AMMCO Washer and Grinder equipment.

1. A typical NAPA grinder may grind 4 shoes and then cut 2 drums for a routine work day.

2. A service station mechanic may normally conduct three brake jobs per day as an average which would consist of washing, grinding approximately 3 sets (6 shoes), and reassembly.

3. In special cases, it is possible for a NAPA dealer selling high volumes of brake shoes to conduct grinding for a full workshift (8-hour day).

In reviewing the data in Table I, it is shown that any grinding of asbestos brake shoes will create exposures to asbestos in excess of the current OSHA limit. Therefore, any service station mechanic or NAPA type dealer would be overexposed to asbestos if asbestos brake shoes are ground. It should be noted that, if the brakes are replaced with non-asbestiform brakes, the operators' exposures would be within the current limits, since the old asbestos shoes are only washed and discarded in their entirety.

Washing operations as noted in sample 18-725, 18-727, 18-728, and 18-729 indicate that employees would not be overexposed to asbestos when performing washing operations and/or when the entire brake pad unit is removed.

It is this hygienist's opinion that old brake shoes, whether containing asbestos or not, should be washed prior to removal and non-asbestiform brake shoes should be installed to eliminate the grinding process to minimize the operators exposures to asbestos.

During this study, it was noted that laundered type cloths were used to wipe down the brake drums once washed. In addition, the water in the collection trays were put down the drain. According to the OSHA Asbestos standard. All this equipment would be considered contaminated. Therefore, special disposal methods according to the standard should be followed.

During this study, exposures for brake jobs were found to be in excess of the current limits; therefore, further requirements, such as providing protective clothing to the operators, as well as including them in a Medical Surveillance Program would be necessary. Please refer to the standard for further requirements and discussion on the various aspects.

Respectfully submitted,

Laurie B. Corsi

Laurie B. Corsi
Industrial Hygienist
Direct Dial Number: (312) 540-2072

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5799H

Attachments: 1910.1001 New OSHA Asbestos standard
BNA ad

TABLE I

ATMOSPHERIC FIBER CONCENTRATIONS
October 2, 1986

AMMCO TOOLS
NORTH CHICAGO, ILLINOIS

Sample Number	Location	Time	Concentration Fibers/cca
OSHA Permissible Exposure Limit (1910.1001)			0.2
OSHA Action Level			0.1
ACGIH Threshold Limit Value			2.0
OPERATOR'S BREATHING ZONE			
Training Center			
	Ben Darda, Senior training instructor		
18-723	Remove tire, wash, grind shoes,and reassemble left side back brake drum	0930/1011	0.02
18-724	Remove tire, wash, grind shoes and reassemble right side back brake drum, and removed front disc brakes and reassembled.	1011/1157	0.23
	TIME WEIGHTED AVERAGE EXPOSURE (Sampling time, 2.4)		0.17
	ESTIMATED TIME WEIGHTED AVERAGE EXPOSURE (8-hour average)c		0.21
	Ben Darda, Senior training instructor		
18-725	Remove back left side brake drum, washing and reassembly, no grinding done	0930/0946	0.03
18-726	Grinding one set of shoes (4 total) (#LS-512-FE-6044 Pt. #514 with bag collection device on	0946/0952 1022/1027	2.8
18-727	Remove right side back drum, wash and reassemble, no grinding	1013/1022 1027/1125	0.02
18-728	Remove front brake disc and reassemble, no washing or grinding	1125/1157	<0.02
	TIME WEIGHTED AVERAGE EXPOSURE (Sampling time, 2.4 hours)		<0.23
	ESTIMATED TIME WEIGHTED AVERAGE EXPOSURE (8-hour average)c		<2.0

TABLE I
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ATMOSPHERIC FIBER CONCENTRATIONS
October 2, 1986

AMMCO TOOLS
NORTH CHICAGO, ILLINOIS

Sample Number	Location	Time	Concentration Fibers/cca
18-729	Ben Darda, Senior training instructor Washing two rear brake drums (removed brakes #3H-FF-11-042-8-KR) disassembled, washed, wire brushed back plate, and reassembled 2 shoes each side (1 set). No grinding.	1354/1454	<0.01
	Sampling time, 1.0 hour ESTIMATED TIME WEIGHTED AVERAGE EXPOSURE (8-hour average)[c]		<0.01
18-730	Ken Laurel, R & D Machinist Grinding 2.5 sets of shoes to 9.5" diameter(LS-512-FE-6078-9, Pt. #246, LS-512-FE6044-Pt. #514, MAM-30-FE -Pt. #462) with bag collection system on	1500/1621	0.48
	Sampling time, 1.3 hours ESTIMATED TIME WEIGHTED AVERAGE EXPOSURE (8-hour average)[c]		0.48
	GENERAL AREA MEASUREMENTS		
18-733	Sample collected at back left side to left of wheel well during removal, washing and reassembly, no grinding	0932/1008	<0.01
18-734	Sample collected at back right side wheel well during removal, washing, and reassembly, grinding conducted in background	1009/1128	<0.01
18-735	Sample collected at both front wheel wells during removal of front disc brakes, no washing or grinding	1128/1158	<0.01
18-736	Sample collected at the bag collection device approximately 4 inches from bag at top of metal holder	1023/1114	0.03

TABLE I
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ATMOSPHERIC FIBER CONCENTRATIONS
October 2, 1986

AMMCO TOOLS
NORTH CHICAGO, ILLINOIS

Sample Number	Location	Time	Concentration Fibers/cc[a]
18-737	Sample collected at the bag collection device approximately 4 inches from bag at top of metal holder	1512/1621	0.09

a fibers per cc denotes fibers per cubic centimeter of air.

< - Denotes a concentration which is less than the concentration specified here. The real number for this sample is below our lower limit of detection for the analytical method.

c Estimated Time-Weighted Average Exposures (ETWAE) - The ETWAE is determined by making assumptions regarding the concentration of asbestos to which operators will be exposed during the portion of the day not sampled if the operation runs an entire day. This is being done as a means of representing the employees' 8-hour ETWAE which can then be compared to the OSHA PEL (8-hour). For this study, the following assumption was made:

Darda - 0.23 fibers/cc asbestos for the remainder of the day for the long term sampling period of samples 18-723 and 18-724

Darda - 2.8 fibers/cc asbestos for the remainder of the day for the short term sampling period of samples 18-725 through 18-728

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