

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE  
CENTER FOR DISEASE CONTROL  
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH  
CINCINNATI, OHIO 45226

HEALTH HAZARD EVALUATION DETERMINATION  
REPORT NO. 78-14-476

GERICO, INC.  
BOULDER, COLORADO

MARCH 1978

I. TOXICITY DETERMINATION

A health hazard evaluation was conducted by the National Institute for Occupational Safety and Health (NIOSH) on January 3 and 11, 1978, at Gerico, Inc., Boulder, Colorado. At the time of this evaluation, breathing zone air samples were taken for aluminum oxide and oil mist. Sound level measurements were also taken throughout the facility. A health hazard did not exist to either aluminum oxide or oil mist at the time of this evaluation. High noise levels were observed in numerous areas of the plant.

II. DISTRIBUTION AND AVAILABILITY

Copies of this determination report are currently available upon request from NIOSH, Division of Technical Services, Information and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days the report will be available through the National Technical Information Service (NTIS), Springfield, Virginia. Information regarding its availability through NTIS can be obtained from NIOSH, Publications Office, at the Cincinnati address.

Copies of this report have been sent to:

1. Gerico, Inc.
2. U.S. Department of Labor/OSHA - Region VIII
3. NIOSH - Region VIII

For the purpose of informing the approximately 60 affected employees, a copy of this report shall be posted in a prominent place accessible to the employees for a period of 30 calendar days.

III. INTRODUCTION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

NIOSH received such a request from plant management at Gerico, Inc., to evaluate the exposures to aluminum oxide and other emissions produced by hot wire cutting of polypropylene webbing.

#### IV. HEALTH HAZARD EVALUATION

##### A. Assembly Area

Gerico makes backpacks for carrying infants, folding baby strollers, and folding baby beds. These items are made from tubular aluminum and polypropylene webbing. During this evaluation, workers that were monitored included those working in cutting, sewing, riveting, and handling the aluminum tubing. One worker was applying cutting oil by hand (from a squeeze bottle) to a punch press. There was limited skin contact, and the worker had not experienced dermatitis. This procedure was very infrequent, and only a small amount of oil was used. The company that supplied the oil was contacted, and the following information was obtained: The cutting fluid is oil-based for metal working; it is diluted one part to 40 parts of water. There are no nitrites, nitrates, or nitrosamines present. The hot wire that was used to cut the polypropylene was not being used during this evaluation. However, the Industrial Hygienist consulted with plant engineers on how to ventilate the hot wire, which would eliminate exposures.

##### B. Evaluation Design

All workers were monitored in the areas where the aluminum tubing was being sewed, cut, riveted, and handled. These workers were monitored for aluminum oxide. One worker was monitored for oil mist. Sound level measurements were taken throughout this area. Each worker was interviewed, and questions were directed at work history and specific medical complaints.

##### C. Evaluation Methods

All breathing zone air samples were collected on filters using vacuum pumps operated at 1.5 liters per minute. Aluminum samples were analyzed by Physical & Chemical Analysis Method No. 173, modified to the extent of using perchloric acid in addition to nitric acid for wet ashing the filters. Oil mist samples were not soluble in chloroform; therefore, analyses were not performed. Data obtained from the supplier of this oil indicated there was no health hazard associated with its use. Sound level measurements were taken with a General Radio sound level meter.

##### D. Criteria for Assessing Workroom Concentrations of Air Contaminants

The source of criteria used to assess workroom concentrations of aluminum oxide was the 1977 Threshold Limit Values (TLVs), Notice of Intended Changes, as set forth by the American Conference of Governmental Industrial Hygienists (ACGIH).

<u>Substance</u>	<u>Permissible Exposure 8-Hour Time-Weighted Exposure Basis (mg/M<sup>3</sup>)</u>
Aluminum Metal and Oxide . . . . .	10

This value corresponds to 30 million particles per cubic foot and has been widely accepted as the appropriate TLV.<sup>1</sup> For noise measurements and the appropriate standard, refer to Table II.

mg/M<sup>3</sup> = approximate milligrams of substance per cubic meter of air

Occupational health standards are established at levels designed to protect individuals occupationally exposed to toxic substances on an 8-hour per day, 40-hour per week basis over a normal working lifetime.

#### E. Toxicology

Aluminum Oxide--The most important route of entry of aluminum oxide is by inhalation. Aluminum oxide should be considered a nuisance dust. Very high exposures can produce a rather non-specific occupational disease (Shaver's disease). There is usually no disease associated with exposures to aluminum.<sup>2</sup>

#### F. Environmental Results and Discussion

This facility was very clean. The initial walk-through survey indicated that a health hazard was not apparent in this facility. However, limited air sampling was done in order to document this initial judgment. Results of environmental samples showed that workers were not overexposed to aluminum oxide. For a description of work areas monitored for aluminum oxide, please refer to Table I. Oil mist did not pose a problem. This was documented by interviewing the worker and literature obtained from the supplier of the cutting oil. Sound level measurements indicated that noise could be at levels that could cause hearing loss.

The only ventilation present in this building was that brought in by the heating and cooling system. This is adequate ventilation for this type of facility. The only area that needs local ventilation is at the hot wire site. The company is presently installing such ventilation. All workers were interviewed. The only consistent complaints were the high noise levels and the aluminum dust which collected on the workers' hands during the handling of the aluminum tubing. None of the workers reported any work-related health problems.

#### Conclusions

Results of the walk-through survey, environmental results, and confidential employee interviews illustrate that none of the workers were overexposed to excessive levels of aluminum oxide. Excessive sound level measurements were observed in several areas.

V. RECOMMENDATIONS

1. Baseline audiograms should be taken on all new workers, with yearly followup audiograms.
2. Metal bins should be padded with soft material such as carpeting to attenuate the noise when aluminum rods are dropped into the bins.
3. The first aid room should be maintained in a more orderly fashion, with pharmaceuticals stored in a locked cabinet.
4. Efforts should be made to lower the noise levels.

VI. REFERENCES

1. Plunkett, E.R. Handbook of Industrial Toxicology, Chemical Publishing Co., New York, 1976, p 20.
2. ACGIH. Documentation of the Threshold Limit Values for Substances in Workroom Air, 1971, pp 9-10.

VII. AUTHORSHIP AND ACKNOWLEDGMENTS

Report Prepared By: Bobby J. Gunter, Ph.D.  
Regional Industrial Hygienist  
NIOSH - Region VIII - Denver, Colorado

Originating Office: Jerome P. Flesch, Acting Chief  
Hazard Evaluation and Technical  
Assistance Branch  
NIOSH - Cincinnati, Ohio

Environmental Sampling Assistance: Arvin Apol  
Regional Industrial Hygienist  
NIOSH - Region X - Seattle, Washington

Report Typed By: Mary Margaret Fehrman  
NIOSH - Denver, Colorado

TABLE I  
BREATHING ZONE AIR CONCENTRATIONS OF  
ALUMINUM OXIDE

Gerico, Inc.

January 11, 1978

Sample Number	Location	Job Classification	Time of Sample	Aluminum Oxide (mg/M <sup>3</sup> )
1	Sub-Assembly	Assembler	7:50 AM - 2:30 PM	*
2	Sub-Assembly	Punch Press Operator	7:50 AM - 2:30 PM	*
3	Sub-Assembly	Assembler	7:50 AM - 2:30 PM	*
Evaluation Criteria				10
Laboratory Limit of Detection				0.005

mg/M<sup>3</sup> = approximate milligrams of substance per cubic meter of air

\* = below laboratory limit of detection

TABLE II  
NOISE LEVELS MEASURED IN dBA  
Gerico, Inc.  
January 3, 1978

Location	Noise Level (dBA)
Tube Punch	97-104
Punch Press	90-94
Bending Machine	95
Riveting Machine	95
Automatic Bung Machine	95
#6 Riveter	86-95
#2 Riveter	86-92
#14 Riveter	86-91
#17 Riveter	86-91

The OSHA standard for an 8-hour exposure is 90 dBA. NIOSH recommends 85 dBA for an 8-hour exposure.

dBA = decibels measured on the A scale