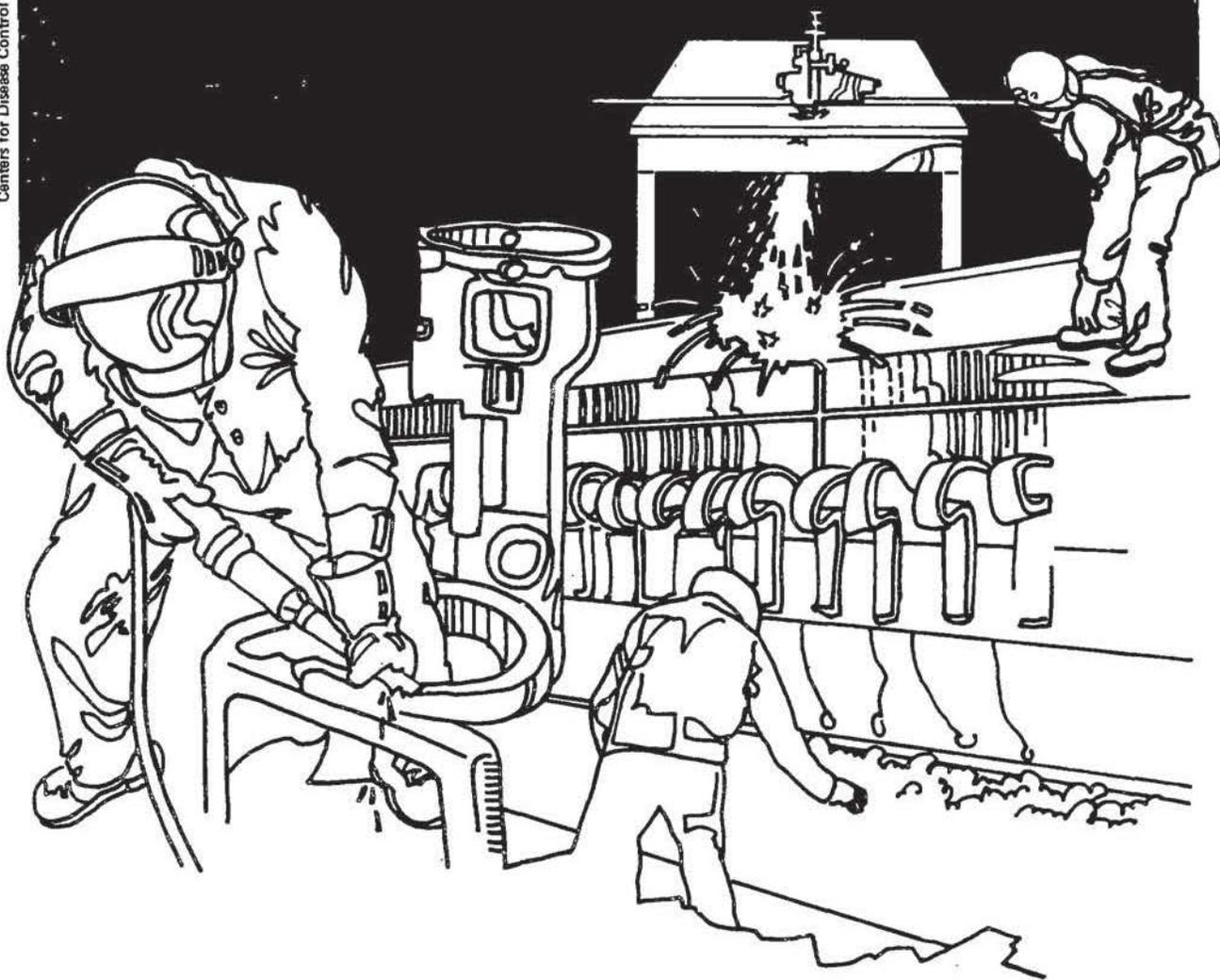


NIOSH



Health Hazard Evaluation Report

HETA 81-461-1013
GIRCH WORK ACTIVITIES
LA JUNTA, COLORADO

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from 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.

The Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.

HETA 81-461-1013
DECEMBER 1981
GIRCH WORK ACTIVITIES
LA JUNTA, COLORADO

NIOSH INVESTIGATOR:
Bobby J. Gunter, Ph.D., IH

I. SUMMARY

In September 1981 the National Institute for Occupational Safety and Health (NIOSH) received a request from the Otero County Health Officer in La Junta, Colorado, to evaluate a potential health hazard to workers at the Girch Work Activities Center in La Junta using a furniture stripper to strip old paints and varnishes from wood furniture.

The Girch Center employees are mentally handicapped. These workers use a furniture stripper containing acetone and toluene. Use of this material is limited to three or four hours per day. Close supervision must be provided due to the handicap of the workers. Only two workers performed the furniture stripping on the day of the survey. Both of these workers were monitored for toluene and acetone. These samples were only collected for the two and one-half hour work period the day of the survey. The highest level measured for acetone was 32 milligrams per cubic meter of air (mg/M^3); the highest level measured for toluene was 97 mg/M^3 . All measurements were well below the evaluation criteria of 1780 mg/M^3 for acetone and 375 mg/M^3 for toluene.

All windows were open and good air movement was evident the day of this survey. It is probable that much higher concentrations would be found during cold months when the building is closed.

Although the environmental samples collected during this survey did not demonstrate overexposures in the stripping room, NIOSH concluded that a potential hazard still exists due to inadequate ventilation and the close contact of the workers with the furniture stripper. A recommendation on preventing a health hazard at this work site is included in this report.

KEYWORDS: SIC 7641 (Reupholstery and Furniture Repair), acetone, toluene, furniture stripping.

II. INTRODUCTION

NIOSH received a request in September 1981 from the Otero County Health Officer in La Junta, Colorado, to determine if there was a health hazard to workers at Girch Work Activities in La Junta from the use of furniture strippers in stripping old paints and varnishes from wood furniture. An environmental survey was conducted on September 18, 1981, to evaluate potential exposure to acetone and toluene. Workers were briefly questioned in relation to their hand contact with the furniture stripper. Laboratory results were discussed with the teacher in charge of the furniture stripping shop.

III. BACKGROUND

The Girch Work Activities Center is a State and Federally funded school for the mentally handicapped. The area of concern during this evaluation was the furniture stripping shop. The only activity conducted in this shop is furniture stripping using a typical furniture stripper containing acetone and toluene.

IV. ENVIRONMENTAL DESIGN AND METHODS

Three breathing zone air samples and one general room air sample for acetone and toluene were collected on organic vapor charcoal sampling tubes and analyzed according to NIOSH P&CAM Method No. 127.

Both workers were monitored that were using the furniture stripper on the day of the survey.

V. EVALUATION CRITERIA

A. Environmental

Three sources of criteria used to assess the workroom concentrations of the chemicals were (1) recommended Threshold Limit Values (TLVs) and their supporting documentation as set forth by the American Conference of Governmental Industrial Hygienists (ACGIH), 1981, (2) the NIOSH criteria for a recommended standards, and (3) the Occupational Safety and Health Administration (OSHA) standards (29 CFR 1910.1000), July 1980.

	Permissible Exposure Limits 8-Hour Time-Weighted Exposure Basis
Acetone.....	2400 mg/M ³ (NIOSH) (OSHA) 1780 mg/M ³ (TLV)
Toluene.....	375 mg/M ³ (NIOSH) (TLV) 750 mg/M ³ (OSHA)

mg/M³ = 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.

B. Toxicological

Acetone -- Acetone may be ingested and inhaled. It is a mucous membrane irritant and a depressant to the central nervous system. Overexposures may produce eczema, conjunctivitis, and corneal erosion. Headaches, dizziness, mental confusion, weakness, and narcosis are the most frequent findings when a worker is exposed to levels exceeding 1780 mg/M³.¹

Toluene -- Toluene is a clear, colorless, non-corrosive liquid with a sweet, pungent, benzene-like odor. Approximately 70% of all toluene that is produced is converted into benzene. Extreme caution when using toluene should be taken since it is often contaminated with benzene. It is dangerously absorbed both by inhalation and skin absorption. Toluene is an irritant, a central nervous system depressant, and may cause liver damage and bone marrow suppression. Some of the common symptoms include defatting dermatitis, bronchitis, pneumonitis, nausea, vomiting, headaches, dizziness, and irritability.^{2,3}

VI. ENVIRONMENTAL RESULTS

One general room and three breathing zone air samples were taken to measure for acetone and toluene. Average concentrations were 18 mg/M³ for acetone and 53 mg/M³ for toluene. These results are well below the evaluation criteria of 1780 mg/M³ for acetone and 375 mg/M³ for toluene.

Breathing Zone and General Room Air Concentrations of
Acetone and Toluene

September 18, 1981

Sample Number	Job Classification	Sample Volume/Liters	mg/M ³	
			Acetone	Toluene
100	Furniture Stripper	12	12	33
101	General Room	10	10	41
102	Furniture Stripper	32	32	97
103	Furniture Stripper	18	18	42

EVALUATION CRITERIA: 1780* 375**

LABORATORY LIMIT OF DETECTION: 0.01 milligrams per sample

*1981 ACGIH Intended Limit for TLV

**NIOSH, TLV

VII. DISCUSSION AND CONCLUSIONS

Although the environmental samples collected during this survey did not demonstrate overexposures in the stripping room, NIOSH concluded that a potential hazard still exists due to inadequate ventilation and the close contact of the workers with the furniture stripper.

At the time of this evaluation all windows were open and good air movement was evident. As cold weather approaches and the building is closed, a serious exposure could occur since ventilation does not exist.

VIII. RECOMMENDATION

Local exhaust ventilation should be installed in the stripping room to eliminate exposure. This ventilation should be installed on or near the stripping table.

IX. REFERENCES

1. Plunkett E.R., Handbook of Industrial Toxicology, Chemical Publishing Company, New York, 1976, pp. 5-6.
2. Criteria for a Recommended Standard...Occupational Exposure to Toluene, HEW Publication No. (NIOSH) 73-11023, Cincinnati, Ohio, 1973.
3. Plunkett, pp. 412-413.

X. AUTHORSHIP AND ACKNOWLEDGMENTS

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

Originating Office: Hazard Evaluation and Technical
Assistance Branch (HETAB)
Division of Surveillance, Hazard
Evaluations, and Field Studies (DSHEFS)
NIOSH, Cincinnati, Ohio

Report Typed By: Marilyn K. Schulenberg
Occupational Health Technician
NIOSH, Region VIII
Denver, Colorado

XI. DISTRIBUTION AND AVAILABILITY

Copies of this report are currently available upon request from NIOSH, Division of Standards Development and Technology Transfer, Information Resources 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. Girch Work Activities.
2. Otero County Health Officer.
3. U.S. Department of Labor/OSHA - Region VIII.
4. NIOSH - Region VIII.
5. Colorado Department of Health.
6. State Designated Agency.

For the purpose of informing 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.

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
ROBERT A. TAFT LABORATORIES
4676 COLUMBIA PARKWAY, CINCINNATI, OHIO 45226

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE. \$300

Third Class Mail



POSTAGE AND FEES PAID
U.S. DEPARTMENT OF HHS
HHS 396