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LAB. CODE LETTERS AND REPORT NUMBER: NBH2.1-1-191(1)

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MIDLAND, MICHIGAN | DEPARTMENT: Chemical Biology Research | DATE: January 24, 1973

AUTHORS: L. G. Silverstein L G Silverstein 1-24-73 | PROBLEM NUMBER: 9085860

TITLE: EVALUATION OF CANOPY HOOD IN THE TRADES TRAINING DEPARTMENT, 294 BUILDING

LAB. CODE LETTERS AND REPORT NUMBER: NBH2.1-1-191(1)

INFORMATIVE SUMMARY WITH CONCLUSIONS

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A canopy hood over the work table used by students in Trades Training is inadequate to control vapors generated in layup of Derakane® resins and is probably inadequate to control asbestos exposure in the course of student activities. The exhaust fan capacity could be put to better use by modification of the hood to provide slot ventilation positioned close to the source of contamination. A recommendation is made to this effect.

REVIEWED BY H R Hayle 1-25-72 jmd

ISSUED TO

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PLAINTIFF'S EXHIBIT
DOW-1355

PROBLEM

Supervision requested evaluation of a recently installed canopy hood in terms of its ability to control fumes generated by student activities with Derakane® and epoxy resins and asbestos.

CONCLUSIONS & RECOMMENDATIONS

1. The present canopy hood installation is not adequate to protect persons working at the bench from fumes generated in Derakane resin work or from inhalation exposure produced by work with asbestos.

2. The exhaust system should be modified to provide a slot ventilation exhaust approximately 3" by 12" at each of the four work stations on the bench.

3. Because of the high toxicity and stringent regulations associated with the use of asbestos, it is strongly recommended that a substitute be found for this work.

4. Materials used in this activity are noted skin irritants and some are known skin sensitizers; therefore, the indoctrination of students in this activity should emphasize the need for minimizing skin contact and unusually good personal hygiene to avoid skin irritation or skin sensitization.

DISCUSSION

Supervision requested evaluation of a recently installed canopy hood over the work bench used by students in the Trades Training Skill Area, second floor of 294 Building. The exhaust rate of this canopy hood was found to be about 1300 cubic feet of air per minute, using an Alnor thermoanemometer. This exhaust rate could provide much improved exhaust ventilation if it is directed through four slot ventilators at the four work positions at the bench. Calculations show that four slots 3" wide by 12" long would produce an air velocity at the face of the slot of approximately 1200 linear feet per minute. This face velocity at the slot should provide good control of vapors produced within 6" to 10" of the slot. It would certainly be better than the

present canopy arrangement and past experience would indicate that it should be adequate to control the vapors produced in Derakane layup work.

Air movement in the breathing zone of persons at the work bench, with the canopy hood on, were observed by generating visible smoke at the work positions. The observers stood at the bench and performed moderate arm and body movements to simulate student activities. The direction of air movement was random and visible smoke reached the observers' breathing zones. The canopy hood exerted no detectable influence on air movement at breathing zone height. Air velocity at the work bench was quite low and variable, ranging from less than 20 to about 50 fpm (linear feet per minute). The low air velocities and high degree of fluctuation at the work bench, plus the lack of definite direction of air flow shown by the smoke tubes, lead to the conclusion that the canopy hood is ineffective as presently used.

During the survey, it was pointed out that asbestos is used as a filler in the operation. Asbestos has been shown to be a severely hazardous material by inhalation exposure. As a result, the federal Occupational Safety & Health Administration

has promulgated stringent requirements for control of exposure, medical surveillance and a number of other related factors as part of the OSHA (Occupational Safety & Health Act) regulations. A copy of the asbestos regulations under OSHA is appended in Appendix I of this report.

Because of the potential hazard and the extreme control and surveillance requirements related to asbestos, it is recommended strongly that a less hazardous substitute be found immediately for use as a filler. If this cannot be done, immediate steps should be taken to monitor the exposure of students while using asbestos and to comply with the other requirements of the regulations in Appendix I.

Derakane resins and epoxy resins and hardeners are known to cause skin irritation (dermatitis) and some components of epoxy resin systems are known to be skin sensitizers. The practices observed and described during this survey are necessary to prevent skin contact because of the consequences of excessive skin contact. It is urged, hereby, that the course include a specific section on potential skin hazards and the safety precautions required to avoid dermatitis or sensitization.

Appendix II is a chapter from a book on the subject of safe handling of epoxy resin systems. This chapter has been condensed into a verbal slide talk using the illustrations shown in Appendix II and is available for use by Trades Training either with or without the author, just so long as you don't misquote him!