

October 23, 2006

TO: V. Guarino HEP  
K. Wood HEP

FROM: J. L. Woodring *JLW* EQO-Industrial Hygiene

SUBJECT: Industrial Hygiene Survey Report, Adhesive Test

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**Operation Surveyed:**

Test gluing of PVC plastic panel. Panel measured 25x48 inches (8.3 sq ft.) with 16 channel sections.

**Location Surveyed:**

Workbench, Building 366, Auger room within the high bay. Room measures 29 ft x 23 ft x 12 ft. high (679 sq. ft. 8145 cu. feet); no ventilation in the room except two wall air conditioners, which were not operating.

**Material or Hazard Measured:**

Methyl methacrylate and methacrylic acid; Product is Devcon Plastic Welder II, #14340, ITW Devcon, Danvers, Massachusetts. Application from double tubes holding adhesive and activator using applicator gun. Total usage 5 tubes holding 47 ml each. Total adhesive activator applied: 237 ml.

**Method of Measurement:**

Methacrylic acid (CAS 79-41-4) was collected on Anasorb 708 sorbent tubes and analyzed by liquid chromatography using a UV detector.

A portable SapphIRe infrared analyzer was used, with a factory setting for methyl methacrylate.

Methyl methacrylate was also collected on activated charcoal sorbent tubes treated with catecholamine and analyzed by gas chromatography.

**Sample Description and Results:**

No Methacrylic acid was detected. This material was not listed in the MSDS for the current product. However, it was analyzed as it was listed in some similar products from this company and some ingredients are not disclosed.

The infrared analyzer indicated about 0.7 ppm methyl methacrylate using the factory setting. However, it was not calibrated by us and loss of the reactive methacrylate may occur in the particulate filter or sample line.

Higher concentrations of the methyl methacrylate were found with the sorbent tubes and laboratory analysis. The odor was clearly present in the work area. However, concentrations were below the current occupational exposure limit (Threshold Limit Value). Refer to Table 1 for a table of results.

**Applicable Standards:**

Methacrylic acid – National Institute Occupational Safety & Health (NIOSH) recommended exposure level (REL) : 20 ppm (70 mg/m<sup>3</sup> air)

Methyl methacrylate - American Conference of Governmental Industrial Hygienists Threshold Limit Values for 2006 -

8 hr time weighted average concentration (Threshold Limit Value-TLV): 50 ppm ( 205 mg/ m<sup>3</sup>air)

15 minute short term exposure limit (STEL): 100 ppm (410 mg m<sup>3</sup>air)

This material is an irritant and sensitizer.

**Recommendations:**

1. Results of this survey indicate exposures to methyl methacrylate below current occupational exposure standards. However, the operation was fairly brief and small scale and should not be used to confidently predict conditions for the full size NOVA neutrino detector construction.
2. A better estimate of emission factor for this process can be obtained through chamber tests where conditions can be better controlled. IH can conduct these tests; we would like to meet to get your input on the proposed test protocol.
3. Notify EQO-Industrial Hygiene at 2-3310 or email me when additional adhesive testing is planned or construction started for the Fermi Neutrino Detector to be constructed in the building 366 high bay. We would like several days advance notice to fit this additional monitoring into our work schedule.
4. Supervisors in areas monitored must notify employees of representative sampling results in writing, either individually or by posting sampling results in an area accessible to affected personnel. The entire survey report need not be presented; however, where exposures exceed permissible exposure levels, planned corrective action must be indicated. Records of this notification must be maintained by your Division in an auditable form and may be reviewed during DOE or internal audits. If you or employees have questions regarding interpretation of results, contact Industrial Hygiene at 2-3310.

**Date of Survey:** August 31, 2006

**cc: G. Dyrkacz  
J. L. Stalker, MD  
IH File – Cabinet NG Building File**

**Survey by:** J.T. Davis  
K.G. Rohrer  
J.L. Woodring

JLW/cn

Table 1

<b>Methyl Methacrylate Vapor Adhesive Test Devcon Plastic Welder II #14340 ITW Devcon, Danvers, MA</b>			
<b>Sample #</b>	<b>Location-Bldg 366 Auger room – high bay</b>	<b>Sample Time (minutes) (8/31/2006)</b>	<b>Methyl Methacrylate Parts per million in air</b>
36423	General air directly above test panel (~ 1 ft.)	61	16
36421	Personal Sample Ken Wood (PR# 40372) Applying adhesive	61	10
36422	General air About 6 ft from gluing operation	61	2