

Luhr Jensen, Hood River, Oregon

Metal Fume Exposure Monitoring for Oregon OSHA Grant Plasma Area

Monitoring Conducted by: Jennifer Ekdahl, Industrial Hygienist
Wise Steps Inc.

On-site: April 11, 2002

Report: April 24, 2002

PURPOSE

Luhr Jensen has an Oregon OSHA engineering control grant to improve the ergonomic controls in the Plasma Area. The grant process also includes improvement in the chemical exposure control system. Sampling was conducted on June 28th, 2001 on the process that was being done. Sampling was conducted to ensure that exposures have been properly controlled with the new Automated Weld Ring Machine.

The primary objective was to determine exposures to common welding fume elements. The sampling that was conducted in June 2001 detected iron and manganese. A comparison of these past results with the sample results from April 11, 2002 will verify whether or not the new controls and automation reduced exposures.

CONCLUSION

The air monitoring results revealed that the new automated process does reduce the employee's exposure to manganese and total welding fume. The employee was exposed to iron at the same level as what was detected during the old welding process. The area sample that was placed directly above the point of weld detected iron, manganese, zinc, and total welding fume at levels well below the exposure limits. Therefore, local exhaust ventilation would not be required.

PROCESS

The automated Weld Ring Machine is a sit-down workstation. An adjustable ergonomic chair is available for the employee to use. The employee attaches a stainless steel coil, annealed “302”, and swivel chain to the luhr on one end. The employee hangs the coil on the automated stage. He uses foot pedals to control the automated stage. The left pedal opens the coil holder and the right foot pedal moves the stage to the welding position. The welding position is enclosed on all sides with yellow plastic curtains.

FINDINGS

The following table summarizes the air monitoring findings. The laboratory analytical report is in Appendix A of this report.

Metal Fume Exposure Levels:

In summary, the employee’s exposure to iron remained the same in both the old and new process. The employee’s exposure to manganese and total welding fume was lower with the new automated process verifying that the automation reduced exposures. The area sample did not justify the need for local exhaust ventilation because all of the metal fume levels detected were well below the exposure limits.

Location/Sample Data	Cd (mg/m³)	Cr (mg/m³)	Cu (mg/m³)	Fe (mg/m³)	Mg (mg/m³)	Ni (mg/m³)	Pb (mg/m³)	Zn (mg/m³)	Total Weight (mg/m³)
Weld Ring Machine: James Phillips Sample #1 – Pump 19 Flow rate 2 lpm Time 9:05 – 10:00 am, 10:15 – 11:30 am, 12:00 – 1:55 pm	<0.0002	<0.0010	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	0.20
Weld Ring Machine: Area Sample – placed above the welding process Sample #2 – Pump 20 Flow rate 2 lpm Time: 9:10 am – 1:55 pm	<0.0002	<0.0010	<0.002	0.002	0.004	<0.002	<0.002	0.002	0.20
<i>Permissible Exposure Limit for a 8-hour shift</i>	<i>0.005</i>	<i>1.0</i>	<i>0.1 (fume)</i>	<i>10.0</i>	<i>5.0 (C)</i>	<i>1.0</i>	<i>0.05</i>	<i>5.0</i>	<i>10.0</i>
<i>Recommended Threshold Limit Values</i>	<i>0.01</i>	<i>0.5</i>	<i>0.2</i>	<i>5.0</i>	<i>0.2</i>	<i>0.2</i>	<i>0.05</i>	<i>5.0</i>	<i>5.0</i>

Note: the less than sign (<) indicates that the element was not detected.

APPENDIX A

LABORATORY ANALYTICAL REPORT