What Employers Should Know about Welding Fumes

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Welder exposure to manganese fumes has been a matter of continuing interest in the construction industry. In some instances state OSHA standards for worker exposure vary from federal OSHA standards. In other instances state and federal standards are not always consistent with exposure recommendations published by welding consumable manufacturers. Litigation over this issue has varied from jurisdiction to jurisdiction across the United States. Some authors refer to manganese as the “next asbestos.”

Manganese is present in a number of welding consumables and is also present, in some form, in base metal. While research currently available has not shown definitive scientific evidence of significant ill effects from exposure to manganese at the low levels found in many fabrication welding operations, some reports suggest that there is a correlation between exposure to high levels of manganese dust and fumes, and development of possible lung and central nervous system (CNS) conditions. The CNS conditions are sometimes described as “Parkinson’s-like” symptoms.

There is currently not a widely-accepted blood test that will accurately determine an individual's exposure to manganese or the accumulation of manganese in an individual's body systems. The only currently-available method to predict a welder’s exposure to manganese fumes is air sampling of the welder’s breathing zone.

Some studies suggest that "normal" welding operations (where recommended welding techniques are utilized in well-ventilated work areas) should not expose welders to concentrations of manganese dust and fumes above most current regulatory thresholds. However, compliance with higher thresholds in some states is much more difficult to achieve without use of special protective equipment. The keys to lower exposures appear to be good ventilation, open spaces, education on good work practices, and avoidance of welding in confined, poorly ventilated conditions for prolonged periods of time. Prolonged welding in confined spaces (such as inside box girders or tanks) without ventilation should be addressed by a combination of welder rotation, respirator use and/or local exhaust ventilation (e.g. smog hogs).

A first course of action for companies that engage in welding operations and have reason to believe that manganese fume exposure could be an issue, would be to conduct air quality testing at the welder's actual work station. This involves placing an air sampling device under the welder's hood to monitor the quality of the air that the welder is actually breathing. The testing itself must be undertaken in accordance with rather strict procedures in order to obtain reliable test results. However, technically competent employer personnel can be trained to conduct the tests themselves properly and at a
relatively low cost. Evaluation of the tests need to be performed by an independent, third-party laboratory

When testing indicates that exposure to manganese welding fumes is elevated a “stepped” analysis of the company’s welding theater and practice is in order. It would include the following:

1. Assure that the air testing is being performed properly.
2. Assure that welders have been trained to utilize welding techniques that minimize the welder’s exposure to welding fumes.
3. In some instances fairly simple modifications can be made to shop ventilation systems. In other cases larger efforts may be necessary.
4. When welding in spaces where high manganese dust or fume concentration cannot be avoided, welder rotation should be practiced and/or application of some form of personal respiratory equipment should be strongly considered. In some cases respirator use could be required by Federal or State OSHA.

In some instances regular quality testing is available at no additional charge to an employer under the terms of company or group insurance policies; and coverage for employee illness resulting from manganese exposure may be provided by workers compensation insurance. However, in other instances common exclusion clauses in many insurance policies could deny coverage to companies that become the object of welding fume litigation. Accordingly, individual company insurance coverage should be reviewed; and, where applicable, counsel from competent insurance professionals who understand this issue is in order.

David Ratterman, a Member of the Stites & Harbison’s Construction Service Group, concentrates his practice in general construction law, with particular emphasis on the fabricated structural steel industry. David has been lead trial counsel for numerous contractors, design professionals, material suppliers and construction owners involved in complex matters in litigation, arbitration and construction mediation. Formally trained as a construction arbitrator and mediator and listed on several national construction neutral panels, David has participated as an ADR neutral or advocate in resolution of construction disputes totaling well in excess of a half billion dollars.