عنوان مقاله:

Designing, Constructing and Installing a Local Exhaust Ventilation System to Minimize Welders Exposure to Welding Fumes

محل انتشار:

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خلاصه مقاله:

Background & Aims of the Study: Welder’s exposure to welding fumes can causeoccupational diseases. The current study sought to examine exposure to welding fumes amongwelders who work in the repair shop of Sarcheshmeh Copper Complex and design a localexhaust ventilation system to control exposure to welding fumes.Materials & Methods: This applied analytical study was conducted in the summer of 2016among welders working in the repair shop of Sarcheshmeh Copper Complex. The studycomprised three phases; in the first one, welders’ exposure to welding fumes was assessed at thebeginning of the study. After that, a local exhaust ventilation system was designed and installedin the aforementioned repair shop. In the final stage, welders’ exposure to welding fumes wasassessed again after installation of the ventilation system. The procedure recommended byNIOSH (method number 7300) was used for individual sampling of welders.Results: Based on the obtained findings, before installing the ventilation system, weldingtechnicians were exposed to 0.3 mg/m3 of copper fumes and 0.04 mg/m3 of chromium fumes.Journeyman welders were also exposed to 2.16 mg/m3 of manganese fumes, while stellarwelders were exposed to 6.9 mg/m3 of iron fumes. In the light of these measurements, a localexhaust ventilation system was designed and installed. Subsequently, measurement of exposureto welding fumes showed a significant reduction. That is, welding technicians were exposed to0.17 mg/m3 and 0.015 mg/m3 of copper and chromium fumes respectively. Additionally,journeyman welders were exposed to 0.86 mg/m3 of manganese fumes, whereas stellar welderswere exposed to 4.3 mg/m3 of iron fumes.Conclusions: A comparison of standard limits of exposure to welding fumes and the resultsobtained from measurements in sampling stations before and after the installation of the localexhaust ventilation system reveals that this controlling measure was very effective in the repairshop of Sarcheshmeh Copper Complex.

کلمات کلیدی:

Fumelocal exhaust ventilationoccupational exposureWeldingSarcheshmeh CopperComplex,Iran