

## S5 PARALLEL SESSION 04

# Occupational exposure to metals fumes: A case study in a metalworking industry

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During welding process, a visible smoke that contains harmful metal fume and gas by-products is produced. The exposure to these welding fumes can bring adverse effects for workers' health, such as fever, bronchitis, fibrosis, chronic inflammation, functional changes in the lung and increased risk of cancer. The workers performing welding tasks are directly exposed to the metal particles produced by the weld. However, it is important to realize that not only the welders may be exposed to these fumes. If there is no particle suppression, these particles can reach other workers. Despite the importance of indirect exposure to welding fumes in metalworking industries, only few studies analyzed this topic. In view of this, the present study aims to characterize the exposure of workers from different departments of a metalworking industry to total and respirable metal particles (welders and indirect exposed workers).

The study was developed in a industry plant, where production processes included sheet welding. Three different groups were considered for this study: A - welders, B - indirect exposed workers and C - control group (without exposure). Environmental exposure assessment and biological monitoring were performed. Samples were collected from 20 welders, 48 indirect exposed workers and 36 unexposed control subjects. Results from two weeks of sampling are presented in this work. Individual air samples were collected in two different moments to evaluate the exposure of workers from groups A and B to total and respirable welding dust. The three groups were instructed to bring an urine sample at Monday morning and at Friday end of the day. Concentrations of manganese (Mn), nickel (Ni), zinc (Zn), copper (Cu) and chromium (Cr) were determined.

Results from environmental assessment showed concentrations of Zn higher than the threshold limit value (TLV) for 5% of welders in what regards to total particles and 10% for the respirable fraction. For biological assessment, high levels of Cr, Cu and Zn were found for several welders, when results were compared to limits of reference and the control group, but also for some neighbors' workers. These results were related to the control measures applied in the workplace and unsafe behaviors adopted by workers. This study is still ongoing. Results after improve control measures in the working plant are being analyzed.