



International Institute of Welding

A world of joining experience

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IIW Statement on Manganese

It has been asserted in the scientific literature and in US courts, that occupational exposure to manganese compounds in fume from welding of steel causes or promotes the onset of Parkinson's disease and/or parkinsonism/manganism in welders and those around them at work. These assertions are being vigorously contested. Informed scientific debate is difficult in the context of litigation, however, and not all aspects about the handling of manganese and its compounds in the body are fully known or certain.

IIW considers that the evidence in the scientific literature shows that:

- a) Compounds containing manganese, in complexes with iron and other oxides, are present in fume particles from steel welding and allied processes.
- b) Clinical manganism and Parkinson's disease are two separate diseases, which, with care and thorough investigation, can be differentiated one from the other.
- c) Studies have not supported the conclusion that welders are or have been at any greater risk of developing Parkinson's disease at all or at an earlier age than others of similar background in other occupations in their community.
- d) Whereas vast numbers of workers world-wide use arc welding to join metal, very few, if any, have developed clinical manganism as a result of exposure to welding fume. The risk may be slightly greater in allied processes such as thermal cutting and gouging or hardfacing in which fume emission levels are inherently higher, but again there have been very few cases.
- e) There is no convincing evidence that exposure to manganese-containing fume during employment as a welder can result in an increased risk of developing neurobehavioural deficiencies and loss of fine control of movements. There is, however, insufficient evidence to the contrary to dismiss the possibility with absolute certainty.

Accordingly, IIW recommends that:

- Exposure to manganese-containing compounds in fume and dusts from welding and allied processes should be minimised, at least, to within applicable national occupational exposure limits.
- Further research is ongoing and additional research should be conducted to advance understanding of:
 - the absorption of these welding-related compounds,
 - how their constituents are handled in the human body and
 - dose-response relationships and any potentially related neurological and neurobehavioural effects.

The welding industry, and industries using welding and allied processes, should play a substantial role in further commissioning, funding and otherwise supporting this research in partnership with governments, labour unions and occupational health organisations.

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