Wilhelmsen Ships Service

Fumes & UV Radiation from Welding are Carcinogenic

Welding fumes now a Group 1 carcinogen

This document aims to give you relevant information to implement preventive measures that reduces the inhalation of welding fumes.

Introduction

Welders in full welding safety gear face a variety of substances at work (e.g. chemicals, fumes, dusts, fibres) which can, under some circumstances, have a harmful effect on their health. These are called 'hazardous substances'. If exposure to a hazardous substance is not properly controlled, it may cause ill health in several ways.

Welding fumes now a Group 1 Carcinogen

Welding fumes and UV radiation are Group 1 carcinogens - the highest designation possible for agents that can cause cancer in humans, with welding fumes' designation being raised from Group 2B since the International Agency for Research on Cancer's (IARC) revision in March 2017.

What led to the change in designation?

When IARC previously assessed the carcinogenicity of welding fumes in 1989, the agency classified them in Group 2B as "possibly carcinogenic to humans."

At the time, IARC based its classification on "limited evidence in human beings" and "inadequate evidence" in experimental animals. According to the agency, its new classification for welding fumes is based on "substantial new evidence" from observational and experimental studies.

UV radiation from welding was previously classified as a Group 1 carcinogen in an IARC monograph published in 2012[1].

What does the change mean for you?

Welding fumes are now added to the family of existing agents that are deemed carcinogenic to humans[2].

AGENTS CLASSIFIED BY THE *IARC MONOGRAPHS*, VOLUMES

Group 1	*Carcinogenic to humans*
Group 2A	*Probably carcinogenic to humans*
Group 2B	*Possibly carcinogenic to humans*
Group 3	*Not classifiable as to its carcinogenicity to humans*
Group 4	*Probably not carcinogenic to humans*

What current Workplace Exposure guidelines should you follow?

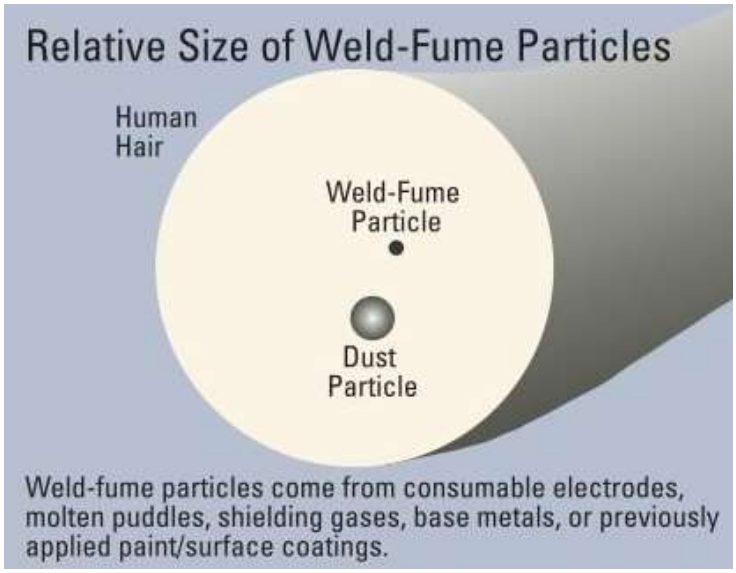
Australia

The fume concentration in the breathing zone (which is inside a welder's helmet when a helmet is worn) must not exceed 5 mg/m^3.

Germany

Technical Rules for Welding Application (TRGS 528) which are based on the TRGS 900 Exposure Limits (when a helmet is worn) must not exceed 1.25mg/m^3.

With TWA"3 (Time Weighted Average), the average airborne concentration of total welding fumes must not exceed 5 milligrams of substance per m^3 of air - when calculated over an 8-hour working day and a 5-day working week. Besides this general exposure standard, there are specific exposure standards for various types of chemicals.

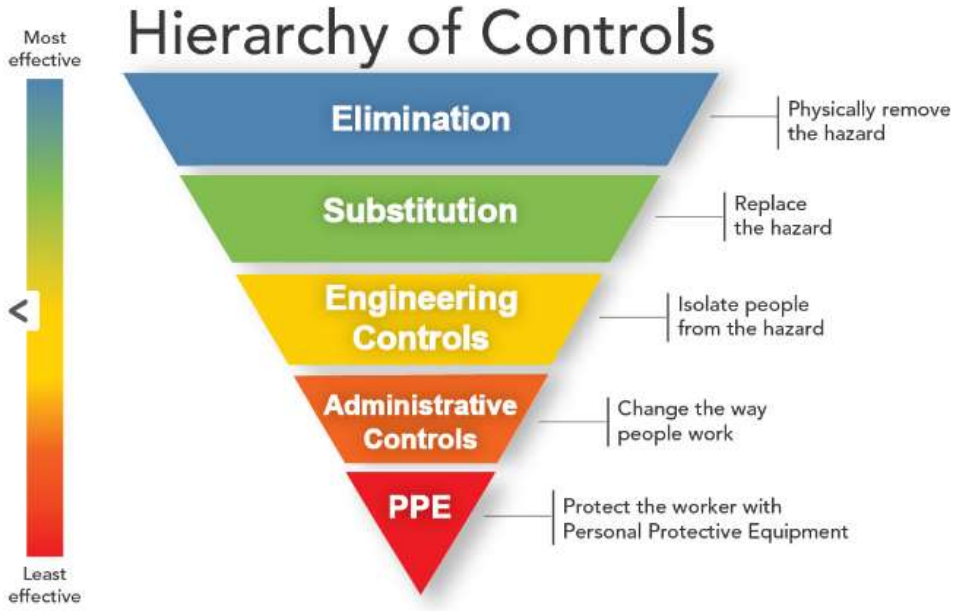


What are the risks?

Former welders are 44 percent more likely to contract lung cancer compared to people who have never worked in the field – based on medical findings (theage.com.au, 2014).

What can be done to protect you?

Carcinogenic effects may take place years from the initiating event to a clinical diagnosis of cancer. The best way to prevent potential problems with welding fumes is to enact OSHA guidelines known as the Hierarchy of Controls. The hierarchy illustrates the comparative effectiveness of various preventive measures, from most effective to least:



If exposure limits cannot be controlled, welders must wear PPE such as the EN12941 (TH2) approved face shield.

Standard EN12941 defines three classes of performance (TH1, TH2, TH3). The classes define the level of performance (leakages in the inner helmet). TH1 is a maximum of 10%, TH2 is a maximum of 2%, and TH3 is a maximum of 0.2%.

References

1) http://aiha.org
2) http://monographs.iarc.fr
3) https://www.awsi.com.au
4) http://www.osap.org