

AMENDMENTS TO THE GUIDANCE NOTE ON THE INTERPRETATION OF EXPOSURE STANDARDS FOR ATMOSPHERIC CONTAMINANTS IN THE OCCUPATIONAL ENVIRONMENT (April 1997)

Pursuant to sub-section 38(1) of the National Occupational Health and Safety Commission Act 1985 (Cwth), the National Occupational Health and Safety Commission hereby gives notice that it has endorsed:

- [amendments to Chapter 17 - Fumes and Gases from Welding and Cutting Processes](#), and
- [the addition of a new chapter - Mineral Oil Additives](#),

to the Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:3008(1995)]^[1].

Title

The guidance note may be cited as *Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:3008]*.

Objective

Regulation 12(1) of the National Model Regulations for the Control of Workplace Hazardous Substances [NOHSC:1005(1994)], requires employers^[2] to take action to prevent exposure of persons in the workplace to hazardous substances at work, or if that is not practicable, to ensure that exposure is adequately controlled so as to minimise risks to health.

As per Regulation 12(4), without limiting the requirements of Regulation 12(1), the employer shall ensure that no employee is exposed to hazardous substances at levels above the appropriate exposure standards for the relevant period of time as listed in the Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)]^[3].

The exposure standards represent airborne concentrations of individual substances which, according to current knowledge, should neither impair the health of, nor cause undue discomfort to, nearly all workers. Except for short-term exposure limits, or where a peak value has been assigned, the exposure standards for airborne contaminants are expressed as a Time-Weighted Average (TWA) concentration of that substance over an eight-hour working day, for a five day working week.

The guidance note provides complementary information on the interpretation and application of the exposure standards.

Amendments to the Guidance Note since May 1995

The third edition of the Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:3008] (Guidance Note) was published in May 1995. Since then Chapter 5 (Exposure Duration) of the Guidance Note has been amended to include formula for adjusting 8-hour TWA exposure standards for altered workshifts. The guidance material on altered workshifts was endorsed by the National Commission in April 1996 and published in the June 1996 Commonwealth of Australia Chemical Gazette.

REFERENCED DOCUMENTS

1. National Occupational Health and Safety Commission, Guidance Note on the Interpretation of Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:3008 (1995)], Australian Government Publishing Service, Canberra, 1995.
2. National Occupational Health and Safety Commission, National Model Regulations for the Control of Workplace Hazardous Substances [NOHSC:1005(1994)] Australian Government Publishing Service, Canberra, 1994.
3. National Occupational Health and Safety Commission, Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC:1003(1995)], Australian Government Publishing Service, Canberra, 1995.

NEW CHAPTER FOR

GUIDANCE NOTE ON THE INTERPRETATION OF EXPOSURE STANDARDS FOR ATMOSPHERIC CONTAMINANTS IN THE OCCUPATIONAL ENVIRONMENT [NOHSC:3008]

MINERAL OIL ADDITIVES

1. The 8-hour time weighted average exposure standard for oil mist of 5 mg/m³ applies to oil mists from highly refined mineral oils. Most formulated products in use are based on highly refined mineral oils plus additives for the purpose of enhancing their properties in specific processes and preventing decomposition. Additives could include; antioxidants, bearing protectors, wear resistors, dispersants, detergents, emulsifiers, viscosity-index improvers, pour-point depressors and antifoaming and rust-

resisting agents.

2. Cutting fluids are one of the main mineral oil products which produce mists during their usage. These compounds are usually a combination of mineral oil with emulsifiers along with a complex additive package including many of the above additives and biocides.
3. The composition of these oils can also change in the process of use. They can become contaminated or breakdown. Processes involving cutting of metals, plastics, etc, causes the mineral oil to become contaminated by fine swarf. Contamination may also occur via metabolic by-products from bacteria or fungi. Heating can cause chemical changes to the oil and produce toxic thermal degradation products such as carbon monoxide as in overheating compressors.
4. Where oils contain significant quantities of these contaminants or additives, the mixtures formula may need to be used to derive an exposure standard more suited to the application, or at the very least the exposures to these additives/contaminants should be determined separately and taken into account in assessing exposures.
5. The chapter on Oil Mist, Refined Mineral, in the National Occupational Health and Safety Commission's Documentation of the Exposure Standards [NOHSC:10003]⁽¹⁾ describes the effects of workplace exposure to mineral oils. Skin contact with mineral oil products should be recognised as an additional route of exposure.

REFERENCED DOCUMENT

1. National Occupational Health and Safety Commission, 'Oil Mist, Refined Mineral' Documentation of the Exposure Standards [NOHSC:10003(1995)], Australian Government Publishing Service, Canberra, 1995.

AMENDED TEXT

GUIDANCE NOTE ON THE INTERPRETATION OF EXPOSURE STANDARDS FOR ATMOSPHERIC CONTAMINANTS IN THE OCCUPATIONAL ENVIRONMENT [NOHSC:3008(1995)]

CHAPTER 17 - FUMES AND GASES FROM WELDING AND CUTTING PROCESSES

17.1 The fumes and gases arising from welding and cutting processes may contain a number of contaminants.

17.2 The composition of the fume depends upon:

- consumables: electrodes or filler metals, heating or shielding gases and fluxes;
- material: chemical composition of material being cut or welded and of any protective coating (eg galvanising) or primer paint, (eg lead-based paints); and
- operating conditions, for example, temperature, current.

17.3 The amount of fume generated depends on:

- process and thermal conditions, for example, amperage, voltage, gas and arc temperatures and heat input which may also vary with the welding position and degree of enclosure and the degree of skill of the welder;
- consumables;
- materials; and
- duration of welding or cutting.

17.4 Fume from gas welding and cutting is generally lower than fume from electric welding and cutting. Exceptions to this include processes involving heavy cutting and gouging. In addition, the welding/cutting arc may cause reactions which produce oxides of nitrogen, carbon monoxide and other gaseous contaminants. The intense ultraviolet radiation emitted from some arcs may also give rise to significant quantities of ozone.

17.5 Technical Note 7⁽¹⁾ produced by the Welding Technology Institute of Australia should be consulted for detailed information on fume generation and control.

17.6 When assessing a particular welding or cutting process, consideration should be given not only to airborne concentration of toxic metals, such as chromium and nickel, which may arise from the parent metal or electrode, but also to the concentration of toxic gases which may be generated by the process. In addition to complying with the individual exposure standards for specific contaminants, the fume concentration in the breathing zone (which is inside a welders helmet when a helmet is worn) should not exceed 5 mg/m³ TWA. Sampling for welding fume should be carried out in accordance with the appropriate Australian Standard⁽²⁾.

REFERENCED DOCUMENTS

1. Welding Technology Institute of Australia, Technical Note 7 Health and Safety in Welding, Sydney, 1994.
2. Standards Australia, AS 3853.1-1991 Fume from Welding and Allied Processes Part 1: Guide to Methods for Sampling and Analysis of Particulate Matter and AS 3853.2-1991 Fume from Welding and Allied Processes Part 2: Guide to Methods for the sampling and Analysis of Gases. Standards Australia, Sydney.