

HAZARDOUS SUBSTANCES

Welding Fume Assessment

The purpose of this information bulletin is to provide practical guidance on fume assessment and control in the workplace. The completed bulletin can provide a record of the assessment.

Legislation

The Northern Territory [Workplace Health and Safety Regulations](#) require employers to identify hazards in the workplace. The fume assessment, outlined in this bulletin, will assist employers to assess the risk and to put into place appropriate control measures to minimise the effect of hazardous fumes generated by processes such as welding, cutting, brazing, gouging or soldering.

The fume assessment provides a quick and easy method for determining the level of ventilation required to reduce the risk of adverse health effects for employees who are exposed to hazardous fumes in their day to day workplace activities.

Specific Material and Electrode Safety data sheets should be provided and consulted when conducting a risk assessment.

Remember to identify all other hazards associated with this work and include these in your risk assessment.

The concept, and values used in this bulletin were prepared by the Welding Technology Institute of Australia (WTIA) and WorkCover.



Occupiers name _____

Workplace address _____

Telephone _____

Facsimile _____

Activity/hazard assessed _____

Date of fume assessment _____

Procedure for Selecting a Fume Control System

Choose the appropriate (F) number from step 1-2-3 below and place in the boxes provided below step 3, add these numbers together to obtain a TOTAL (F) number.

Step 1	Welding Process	(F)
Process		
Electrode gas welding Electroslag welding (ESW) and consumable Guide welding Submerged arc welding (SAW)		2
Brazing Gas tungsten arc welding (GTAW, TIG) Gas welding/cutting Silver soldering, standard soldering		4
Arc cutting Gas metal arc welding (CMAW, MIG) Manual metal arc welding (MMAW) Plasma arc welding (PAW) Resistance welding Thermit welding Plasma gouging		7
Arc air gouging Flux cored arc welding (FCAW)		9
Plasma arc cutting		15

Step 2		Type of Metal and Fume Hazard	(F)
Material	Fume Hazard		
Aluminium (flake paint spray powder and wires)	Aluminium		0
Aluminium and its alloys (plated extrusions, castings, welding consumable etc)	Ozone		20
Aluminium bronze	Copper		10
Braze and bronze	Copper		10
Brazing filters			
Cadmium bearing	Cadmium		50
Cadmium free	Copper		
Brazing fluxes	Fluorides		10
Casting, iron welding electrodes for bronze type	Copper		10
Nickel/nickel iron type	Nickel		20
Coating, metal on steel			
Cadmium	Cadmium		50
Chromium	Chromium		20
Copper	Copper		10
Lead	Lead		20
Nickel	Nickel		20
Tin	Tin		0
Zinc	Zinc		10
Coating plastic on steel	Organic		20
Copper and its alloys			
Copper, brass or bronze	Copper		10
Copper-beryllium alloy	Beryllium		50
Degreasing agents			
Chlorinated hydrocarbons decomposition products	Phosgene		20
Dissimilar metal joints			
High alloy stainless electrodes	Chromium		20
Nickel alloy electrodes	Nickel		20
Galvanised steel (hot zinc dipped, or plated, zincalume)	Zinc		10

Step 2	Type of Metal and Fume Hazard	(F)
Lead, lead coated steel	Lead	20
Low hydrogen electrode (basic)	Fluorides	10
Magnesium and its alloys Plate extrusions and casting dusts	Magnesium	10
Metal spraying		
Aluminium	Aluminium	0
Molybdenum	Molybdenum	10
Lead	Lead	20
Zinc	Zinc	10
Other metals in paint		
Aluminium flake	Aluminium	0
Lead chromate	Chromium	20
Red lead	Lead	20
Zinc chromate	Chromium	10
Paint coatings on steel etc		
Cadmium based	Cadmium	50
Epoxy type	Organic	20
Weld through primers	Organic	20
Zinc based	Zinc	10
Plated steel etc		
Cadmium	Cadmium	50
Chromium	Chromium	20
Zinc (see galvanised steel)	Zinc	10
Solders		
Silver solder cadmium based	Cadmium	50
Silver solder cadmium free	Silver	10
Tin-lead soft solder	Lead	20
Steel types		
All	Iron	0
Austenitic magnesium wear resistance	Magnesium	10
Cryogenic steels 91% nickel	Nickel	10
Leaded steel	Lead	20
Maraging steels	Lead	20
Stainless steel	Chromium	20
Tool steels > 5% CR	Chromium	20
Surfacing (hardfacing) consumable	Chromium	20

Note: Where more than one Fume Hazard is present use the highest (F) number.

Step 3	Work Position	(F)
Position		
Outdoor		0
Open workspace, where all of the below must hold: Welder keeps heads out of plume Roof of high wall vents exist Free cross flow ventilation exists Av space per welder exceeds 300m ³		12
Limited workspace which includes: Welding bays Areas with welding screens, curtains, etc		16
Confined workspace which include: Spaces defined in AS2865 Pits, tanks, vessels, vats, pipes, flues		24

Step 1

Step 2

Step 3

Total: (F) =

From the table below choose the appropriate box with the number which best fits TOTAL (F) from above. This then becomes the preferred requirements for fume control:

Fume control requirement

Total	Requirement	Total (F)	Requirement
2 to 9	Natural ventilation (eg, open doorway)	21 to 53	At source extraction
10 to 20	Mechanical dilution ventilation	54+	At source extraction plus respiratory protection

At source fume extraction equipment which may be required (contact supplier for appropriate equipment to be used):

- | | | | | | |
|-------------------|--------------------------|--------------|--------------------------|-----------------|--------------------------|
| Filtered | <input type="checkbox"/> | Non filtered | <input type="checkbox"/> | Fixed | <input type="checkbox"/> |
| Mobile | <input type="checkbox"/> | Portable | <input type="checkbox"/> | In-bench system | <input type="checkbox"/> |
| Stand alone inlet | <input type="checkbox"/> | On-gun inlet | <input type="checkbox"/> | | |

Respiratory equipment which may be required (contact supplier for appropriate equipment to be used):

- | | | | | | |
|------------|--------------------------|----------|--------------------------|----------------|--------------------------|
| Disposable | <input type="checkbox"/> | Reusable | <input type="checkbox"/> | Powered (PAPR) | <input type="checkbox"/> |
|------------|--------------------------|----------|--------------------------|----------------|--------------------------|

Comments:

**Name of person
conducting assessment**

Signature

Date

Resources

- NT Workplace Health and Safety Regulations
- [National Model Regulations for the Control of Workplace Hazardous Substances](#) [NOHSC:1005(1994)] and [National Code of Practice for the Control of Workplace Hazardous Substances](#) [NOHSC:2007(1994)]
- [Guidance Note for the Assessment of Health Risks Arising from the Use of Hazardous Substances in the Workplace](#) [NOHSC:3017(1994)]
- WTIA Fume Minimisation Guidelines.
- WTIA TN 7-94, Health and Safety in Welding.

For further information please contact NT Worksafe on 1800 019 115 or go to worksafe.nt.gov.au