Material Safety Data Sheet
MSWF-1 Reference Material

1. Product Identification

Material: Mild steel welding fume (HSL MSWF-1)

Laboratory chemical matrix reference material

Producer: HSE's Science and Research Centre
Harpur Hill
Buxton
Derbyshire
UK
SK17 9JN

Contact: Owen Butler (00 44 (0)20 30282138)

2. Product Description, Composition and Use

Physical Form: Condensed fume from laser spot welding of zinc coated mild steel components. Bulk fume sieved to pass a 200 µm aperture. Oxidic material consistent with the following major crystalline phases identified by X-ray diffraction as Fe_3O_4, ZnO, MnO and graphitic carbon.

Composition:

Iron	43 % (*m/m*)
Zinc	22 % *(m/m)*
Manganese	1.5 % (*m/m*)
Carbon	~ 1 % *(m/m)*
Copper	< 0.5 % *(m/m)*

CAS Number: -

Identified use: A bottled unit HSL MSWF-1 consists of a nominal 1 g of bulk fume. This laboratory chemical matrix reference material has been produced to assist analysts in verifying the performance of the analytical methods they employ in the elemental analysis of welding fume samples collected from the working environment. In particular this material is designed to check the performance of applying a dissolution step, as codified

in standard validated methods such as ISO 15202-2, ASTM D7035, NIOSH 7300, OSHA 125G, EN 13656 and EPA 3052 with subsequent analysis using atomic spectrometric techniques.

This material can also be used to assist in developing new sample dissolution procedures, preparing matrix recovery quality control charts or in the training of new analysts. This material is not to be used for instrument calibration.

3. Hazard Identification

Classification of the mixture

Iron (as Fe_3O_4):

Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]:
Skin irritation (Category 2).
Eye irritation (Category 2).
Specific target organ toxicity – single exposure (Category 3).

Classification according to EU Directive No 67/548/EEC:
Irritating to eyes, respiratory system and skin.

Zinc (as ZnO):

Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]:
Acute aquatic toxicity (Category 1).
Chronic aquatic toxicity (Category 1).

Classification according to EU Directive No 167/548/EEC:
Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Manganese (as MnO):

Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]:
Acute toxicity, Dermal (Category 3).
Skin irritation (Category 2).
Eye irritation (Category 2).
Specific target organ toxicity – single exposure (Category 3).

Classification according to EU Directive No 67/548/EEC:

Irritating to eyes, respiratory system and skin.

Labelling

Iron (as Fe_3O_4):

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard statement(s):

H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.

Precautionary statement(s)

P261	Avoid breathing dust.
P280	Wear protective gloves/protective clothing/eye protection.
P305/351/338	If in eyes, rinse cautiously with water for several minutes. Remove contact lens, if present and easy to do. Continue rinsing.

Labelling according to European Directive 67/548/EEC as amended

R-phrase(s)

R36/37/38	Irritating to eyes, respiratory system and skin.

S-phrase(s)

S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.

Zinc (as ZnO):

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard statement(s):

H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)

P273 Avoid release to the environment.

Labelling according to European Directive 67/548/EEC as amended

R-phrase(s)

R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-phrase(s)

S61 Avoid release to the environment.

Manganese (as MnO_2): **Labelling according to Regulation (EC) No 1272/2008 [CLP]**

Hazard statement(s):

H315 Causes skin irritation

H319 Causes serious eye irritation

H335 May cause respiratory irritation

Precautionary statement(s)

P261 Avoid breathing dust

P280 Wear protective gloves/protective clothing/eye protection

P305/351/338 If in eyes, rinse cautiously with water for several minutes. Remove contact lens, if present and easy to do. Continue rinsing.

Labelling according to European Directive 67/548/EEC as amended

R-phrase(s)

R36/37/38 Irritating to eyes, respiratory system and skin.

S-phrase(s)

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39 Wear suitable protective clothing, gloves and eye/face protection

4. Routes of Exposure and First Aid Measures

Inhalation: Remove sources of contamination or remove victim to fresh air. Obtain medical advice immediately.

Eyes: Rinse with water. Ensure to remove contact lens before rinsing.

Skin: Wash gently and thoroughly with water and non-abrasive soap. If irritation persists obtain medical attention.

Ingestion: Rinse mouth thoroughly with water. If vomiting occurs naturally rinse mouth and repeat administration with water. Obtain medical advice immediately.

5. Fire Fighting Measures

Suitable Fire Extinguishers: Not Applicable

Unsuitable Fire Extinguishers: Not Applicable

Hazardous Decomposition: Not Applicable

Special Procedures: Not Applicable

6. Accidental Release Measures

Exposure Controls:	Restrict access to area until completion of clean up. Ensure clean up is conducted by trained personnel, who are adequately protected. Wet swab spilled material; scrape up into sealable container and label.
Personal Protection:	For use in a laboratory setting only. Recommended use of laboratory safety glasses, disposable gloves and laboratory coat.
Disposal:	The material should be handled and disposed of in accordance with guidelines for handling laboratory reagents in force at the site of end use or disposal.

7. Handling and Storage

The material should be used, handled and stored only in an analytical chemistry laboratory setting. The material should only be handled in a fume cupboard or other similar enclosures. Any ventilated enclosures should be fitted with High Efficiency Particle Aerosol (HEPA) filters on the extraction port.

The material is a laboratory chemical matrix reference material and should be stored sealed in the supplied container in a dry enclosure when not in use.

8. Exposure Controls

Control Limits: **HSE EH40/2005 Workplace exposure limits (WEL) (3rd edition 2018)**

	8-hour TWA	**15 minute STEL**
	Inhalable limit values (unless stated)	
Iron oxide (fume)	5 mg m^{-3}	10 mg m^{-3}
Manganese and its inorganic compounds (as Mn)	0.05 mg m^{-3} (respirable limit value)	
Copper oxide (fume)	0.2 mg m^{-3}	-

Deutsche Forschungsgemeinschaft (Germany)

8-hour TWA

	MAK Respirable limit value
Zinc oxide (fume)	0.1 mg m^{-3}
Biological Exposure Limits:	Not Applicable

9. Physical and Chemical Properties

Appearance: Powder.

Odour: Metallic.

pH: No data available.

Boiling Point: No data available.

Melting Point: No data available.

Flash Point: Not Applicable.

Combustibility: Non-combustible.

Auto-Flammability: Non-flammable.

Explosive: None.

Oxidising Properties: Not applicable.

Vapour Pressure: Not applicable.

Relative Density: No data available.

Solubility: No data available.

Partition Coefficient: Not applicable.

Miscibility:	Not applicable.
Vapour Density:	Not applicable.
Evaporation Loss:	Not applicable.
Viscosity:	Not applicable.

10. Stability and Reactivity

Stability:	Stable.
Hazardous Polymerisation:	Not applicable.
Hazardous Decomposition Products:	None known.

11. Toxicological Information

Toxic Effects:	Limited evidence for human carcinogenicity Current classification: Group 2B (IARC Monograph 49, 1990)
Chronic Effects:	Long term respiratory exposure and short term high exposure may result in coughing, wheezing and decreased pulmonary function.

12. Ecological Information

Mobility:	Not likely to be mobile.
Persistence and Degradability:	Not likely to biodegrade.
Bio-accumulative Potential:	No data available.
Aquatic Toxicity:	ZnO is toxic to aquatic life.

13. Disposal Considerations

The material should be handled and disposed of in accordance with guidelines for handling laboratory reagents in force at the site of end use or disposal.

14. Transport Information

Zinc (as ZnO):

UN Number

ADR/RID: 3077.

IMDG: 3077.

IATA: 3077.

UN proper shipping name

ADR/RID: Environmentally hazardous substance, solid, N.O.S.

IMDG: Environmentally hazardous substance, solid, N.O.S.

IATA: Environmentally hazardous substance, solid, N.O.S.

Transport hazard class(es)

ADR/RID: 9.

IMDG: 9.

IATA: 9.

Packaging group

ADR/RID: III.

IMDG: III.

IATA: III.

Environmental hazards

ADR/RID: yes.

IMDG: Marine pollutant.

IATA: yes.

15. Regulatory Information

This safety datasheet complies with the requirements of Regulation (EC) No 1907/2006

16. Other information

The above information is believed to be correct and based upon the present state of our knowledge and is applicable to this product with respect to appropriate safety precautions.

This laboratory chemical matrix reference material has been produced in accordance with international guidelines for the preparation and certification of reference materials.

In no event shall HSE be liable for any damages (including, without limitation, lost profits, business interruption, or lost information) arising out of the use of or inability to use HSE chemical matrix reference materials, even if HSE has been advised of the possibility of such damages.