



## SAFETY DATA SHEET

**SUBSTANCE:** Zinc Metal

**COMPANY:** Britannia Zinc Limited  
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### Composition

Zinc metal is supplied by Britannia Zinc Limited in various grades of purity, depending on customer requirements, in blocks, plates, ingots etc. The following is the approximate composition (w/w) range across all the grades of metal produced:

Zinc	98.5%-99.995%	Arsenic	<0.001%-0.017%	Iron	< ,0.05 %
Lead	<0.003% - 1.35%	Antimony	<0.001%-0.017%	Tin	<0.001%-0.1%
Cadmium	<0.003 - 0.01%	Thallium	<0.001%-0.07%	Aluminium	<0.02%
Copper	<0.002%-0.1%	Indium	<0.001%-0.01%		

### Hazards

Zinc metal in massive form is not classified as hazardous. However, hazards may be created by change in the physical condition of the metal, e.g. during melting.

On heating zinc metal above 750°C freshly formed fumes of zinc oxide will be evolved. Zinc oxide fume is associated with the onset of Metal Fume Fever, a reversible illness with flu-like symptoms.

If the lead content of the metal is over 1% and the physical state of the metal is altered and dust or fume generated the hazard classification is then:

**Xn:** Harmful by inhalation and if swallowed      Risk phrases: R20/22-33  
Danger of cumulative effects      Safety phrases: S13-20/21  
Keep away from food, drink and animal feed  
When using do not eat, drink or smoke

If the lead content of the metal is over 1% the Control of Lead at Work Regulations requires an assessment of exposure, and therefore risk, to be made. Extensive operational experience plus the benefit of measuring exposure under these circumstances leads this company to assess the risk as being insignificant due to the amount of lead present, its form and the working temperatures involved. Therefore the Control of Lead at Work Regulations are deemed by assessment not to apply and no further action is necessary.



## First Aid

Zinc metal poses no documented risk to health, however during use if the physical state of the metal is altered; health risks may be created.

**Inhalation:** Inhalation of metallic oxide fumes may lead to the onset of metal fume fever - remove from exposure, rest and keep warm and seek medical advice.

**Ingestion:** Wash out mouth thoroughly with water, give water to drink.

**Eyes:** Wash out thoroughly with water. If discomfort persists seek medical attention.

**Skin:** Wash affected areas with soap and water and remove contaminated clothing.

## Fire Fighting

- Zinc metal does not burn under normal conditions. However, if exposed to extreme heat or fire, toxic metallic oxide fumes may be liberated.
- Wear appropriate breathing apparatus.
- Extinguish fire with a suitable extinguishing media.

## Accidental Release

Not applicable to metallic zinc, however, do not over heat molten zinc. Extracted air containing metallic or metallic oxides should be cleaned before discharge.

## Handling and Storage

- Avoid generating dust or fumes
- Keep away from food, drink and animal feed
- When using do not eat, drink or smoke.
- Store dry, away from extreme heat or fire
- Use only in well ventilated conditions
- Do not add damp metal to molten metal baths
- Store away from acids or alkalis

## Remelting

During the production of any cast product it is impossible to eliminate the possibility of the formation of cavities or surface cracks during solidification of the product.

Additionally, because metal ingots and blocks react slowly to ambient temperature variations, it is possible for condensation to form on the outside of the product during storage.

For these reasons it is recommended that a cautious approach is adopted when adding zinc to molten metal baths. The following is recommended.



- If possible preheat the zinc to eliminate moisture. In the case of blocks this may not be practical due to the extended preheat time required.
- All personnel associated with the addition of the zinc , or those within the adjacent working areas , must wear the appropriate PPE.
- If the zinc bath has a fume enclosure the doors should be closed prior to addition of the zinc.
- The use of PPE should be maintained until the zinc is fully melted.

Advice on the correct PPE can be obtained from Britannia Zinc Ltd (Tel: 0117 980 2516 – Occupational Hygienist), or Galvanizers Association (Tel: 0121 355 8838).

### Exposure Controls

EH40 lists the following applicable exposure limits:

Zinc oxide, fume	OES	8 hour TWA	5.0 mg/m <sup>3</sup>
		15 minute	10.0 mg/m <sup>3</sup>
Lead and compounds	OEL	8 hour TWA	0.15 mg/m <sup>3</sup>

- Do not breath dust or fume. Approved respiratory protective equipment should be used.
- Where possible, local exhaust ventilation should be provided.
- Strict control on melt bath temperatures is recommended to avoid generating excessive fumes.

### Physical/Chemical Properties

The following properties are listed for pure zinc - impurities may slightly affect these figures.

Melting point	:	419.35°C
Solubility in water	:	Nil
Boiling point	:	908°C
Solubility (other)	:	Soluble in acids and alkalis
Density	:	7.14
Vapour pressure	:	1.33 hPa at 487°C

### Stability and Reactivity

- Stable under normal conditions
- Reacts with acid and alkalis generating nascent hydrogen which may form explosive mixtures in air

### Toxicological and Ecological Information

- The potential of metallic zinc to harm the environment is very low due to the low bio-availability of metallic zinc



- Toxicological and ecological data and classification for zinc are currently under review as part of the EU existing substances regulations – no data is available yet.

### Disposal

All zinc bearing emissions or effluents from process plants should be suitably cleaned or treated before release in accordance with legislation. Process wastes or residues formed during the use of zinc and zinc alloys tend to concentrate some of the impurities in the materials involved in the process. Care should be taken when handling or heating these wastes or residues as in contact with water or acids toxic and/or flammable gases may be liberated.

Zinc wastes and residues should be stored in a dry, ventilated area away from contact with acids or water. It is recommended that reprocessing or treatment of zinc wastes and residues is carried out by specialists who are aware of the risks involved. For further information please contact Britannia Zinc Limited.

### Transport Information

Zinc metal is not hazardous for conveyance by road or rail.

### Regulatory Information

The Control of Substances Hazardous to Health Regulations apply to this substance and if the lead content exceeds 1% so do The Control of Lead at Work Regulations (see hazards paragraph).

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