



SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Zinc SHG

Synonyms: zinc, solid, ZINC, SHG (Special High Grade), Zinc Anodes

CAS No.: 7440-66-6

EC No.: 231-175-3

Molecular Mass: 65.37 g/mol

Chemical Formula: Zn

Manufacturer:

IMC-MetalsAmerica, LLC
135 Old Boiling Springs Road
Shelby, NC 28152 USA
704-482-8200

Emergency Telephone: 704-482-8200
Outside the US Call: 011-704-482-8200

SECTION 2: COMPOSITION / INFORMATION ON INGREDIENTS

Substances:

Name	CAS No.	Conc.	Hazardous
zinc, solid, in massive state	7440-66-6	>99.995	No

SECTION 3: HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Classification according to Regulation EC No. 1272/2008

Not classified as dangerous according to the criteria of Regulation (EC) No. 1272/2008.

Classification according to Directive 67/548/EEC-1999/45/EC

Not classified as dangerous according to the criteria of directive(s) 67/548/EEC and/or 1999/45/EC.

Label elements:

Labeling according to Regulation EC No. 1272/2008 (CLP)

Not classified as dangerous according to the criteria of Regulation (EC) No. 1272/2008

Other hazards:

CLP

Substance does not meet the screening criteria for persistency nor bioaccumulation so it neither PBT nor vPvB.

The melting down of moist metal leads to explosion risk.

Heated product causes burns.

Caution! This substance is subject to exposure limits.

Highly toxic to fishes.

Highly toxic to aquatic plants.

Toxic to bacteria.

Mixtures:

Not applicable.

SECTION 4: FIRST AID MEASURES

Description of first aid measures:

After inhalation:

After inhalation of fume: Remove the victim into fresh air. Respiratory problems: consult a doctor/medical service.

After skin contact:

In case of burns: Wash immediately with lots of water (15 minutes)/shower. Remove clothing while washing. Do not tear off solidified product from the skin. Do not remove clothing if it sticks to the skin. Cover wounds with sterile bandage.

Consult a doctor/medical service. If burned surface > 10%: take victim to hospital.

After eye contact:

After contact with fume: Rinse immediately with plenty of water for 15 minutes. Take victim to an ophthalmologist.

After ingestion:

Not applicable.

Most important symptoms and effects, both acute and delayed:

Acute symptoms

After inhalation:

AFTER INHALATION OF DUST: Irritation of the nasal mucous membranes. Dry/sore throat. Coughing. AFTER INHALATION OF FUME: Feeling of weakness. Metal fume fever. Vomiting. Nausea.

After skin contact:

IF MELTING: Burns.

After eye contact:

IF MELTING: Burns

After ingestion:

No data available.

Delayed symptoms

No data available.

Indication of any immediate medical attention and special treatment needed:

Not applicable.

SECTION 5: FIRE FIGHTING MEASURES

Extinguishing media:

Suitable extinguishing media:

Adapt extinguishing media to the environment.

Unsuitable extinguishing media:

Water (if molten).

Special hazards arising from the substance or mixture:

On burning formation of metallic fumes (zinc oxide). In molten state: violent to explosive reaction with water (moisture).

Advice for firefighters:

Instructions:

Dilute toxic gases with water spray. In case of metal bath fire: add metal blocks. When cooling/extinguishing: no water in the substance.

Special protective equipment for fire-fighters:

Gloves. Protective clothing. Heat/fire exposure: compressed air/oxygen apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

No naked flames.

Protective equipment for non-emergency personnel

See heading 8.2.

Protective equipment for emergency responders

Gloves. Protective clothing.

Suitable protective clothing

See heading 8.2

Environmental precautions:

No data available.

Methods and material for containment and cleaning up:

If melted: allow liquid to solidify before taking it up. Pick-up the material. Wash clothing and equipment after handling.

Reference to other sections:

See heading 13.

SECTION 7: HANDLING AND STORAGE

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

Precautions for safe handling:

Avoid raising dust. Keep away from naked flames/heat. Observe strict hygiene. On (re)melting down: dry and preheat installation before use. Add only dry material to the metal bath.

Conditions for safe storage, including any incompatibilities:

Safe storage requirements:

Meet the legal requirements. Store in a dry area. Keep at temperature above the dew point. Temperature above dew point.

Keep away from:

(Strong) acids.

Suitable packaging material:

No data available.

Non suitable packaging material:

No data available.

Specific end use(s):

If applicable and available, exposure scenarios are attached in annex. See information supplied by manufacturer.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters:

Occupational exposure

Occupational exposure limit values

If limit values are applicable and available these will be listed below.

TLV (USA)

Zinc oxide	Short time value	10 mg/m ³	
	Time-weighted average exposure limit 8 h	2 mg/m ³ (R)	(R): Respirable fraction

National biological limit values

If limit values are applicable and available these will be listed below.

Applicable limit values when using the substance or mixture as intended.

If limit values are applicable and available these will be listed below.

DNEL/PNEC values

Workers

Zinc SHG

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects oral	0.83 mg/kg bw/day	
	Long-term systemic effects dermal	83 mg/kg bw/day	
	Long-term systemic effects inhalation	5 mg/m ³	

General population

Zinc SHG

Effect level (DNEL/DMEL)	Type	Value	Remark
DNEL	Long-term systemic effects oral	0.83 mg/kg bw/day	
	Long-term systemic effects dermal	83 mg/kg bw/day	
	Long-term systemic effects inhalation	2.5 mg/m ³	

PNEC

Zinc SHG

Compartments	Value	Remark
Fresh water	20.6 µg/l	
Marine water	6.1 µg/l	
Fresh water sediment	117.8 mg/kg sediment dw	
Marine water sediment	56.5 mg/kg sediment dw	
Soil	35.6 mg/kg soil dw	
STP	0.052 mg/l	

Exposure controls:

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

Appropriate engineering controls:

Avoid raising dust. Keep away from naked flames/heat.

Individual protection measures, such as personal protective equipment:

Observe strict hygiene. Do not eat, drink or smoke during work.

Respiratory protection:

Dust production: dust mask with filter type P2.

Hand protection:

Gloves, on heating: insulated gloves.

Materials for protective clothing (good resistance): leather

Eye protection:

On (re)melting down: face shield.

Skin protection:

Protective clothing. On (re)melting down: heat proof clothing. Protective clothing against molten metal splash (EN-ISO 9185). Protective clothing for workers exposed to heat (EN-ISO 11612). Safety shoes type S3.

Environmental exposure controls:

See headings 6.2, 6.3 and 13.

SECTION 9: PHYSICAL & CHEMICAL PROPERTIES

Information on basic physical and chemical properties:

Physical form:	Solid, Metal, Physical state depending on the production process	Boiling Point:	907°C; Not required: exemption according to REACH
Odor:	Odorless	Flash point:	Not applicable
Color:	Commercial substance: grey-white	Evaporation rate:	Not applicable; ether
Explosion limits:	Not applicable	Vapor pressure:	Data not required
Flammability:	Not combustible	Solubility:	water; insoluble
Melting Point:	416°C; 1013 hPa	Relative density:	7.1; 20°C

Physical hazards:

No physical hazard class.

Other information:

No data available.

SECTION 10: STABILITY & REACTIVITY

Reactivity:

Not applicable.

Chemical stability:

Stable under normal conditions.

Possibility of hazardous reactions:

In molten state: violent to explosive reaction with water (moisture). Oxidizes slowly in moist air.

Conditions to avoid:

Avoid raising dust. Keep away from naked flames/heat.

Incompatible materials:

(Strong) acids.

Hazardous decomposition products:

Reacts with (some) acids: release of highly flammable gases/vapors (hydrogen). On burning formation of metallic fumes (zinc oxide).

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects:

Test results

Toxicokinetics: summary

Zinc compounds release, depending on their solubility, zinc cations which determine the biological activity of the respective zinc compounds. Sufficient data is available on the soluble zinc compounds zinc chloride and zinc sulphate and on the slightly soluble zinc compounds ZnO and ZnCO₃.

Zinc is an essential trace element which is regulated and maintained in the various tissues mainly by the gastrointestinal absorption and secretion during high and low dietary zinc intake and because of the limited exchange of zinc between tissues, a constant supply of zinc is required to sustain the physiological requirements. The zinc absorption process in the intestines includes both passive diffusion and a carrier-mediated process. The absorption can be influenced by several factors such as ligands in the diet and zinc status. Persons with adequate nutritional levels absorb 20-30% and animals absorb 40-50%. Persons that are zinc deficient absorb more, while persons with excessive zinc intake absorb less.

For the soluble zinc compounds, the available information suggests an oral absorption value of 20%. This value can be considered as the lower bound range at adequate nutritional levels. The oral absorption of the slightly soluble zinc oxide has been shown to be 60% of that of the soluble zinc compounds. This corresponds to approximately 12-18%. No oral absorption information is available for the remaining slightly soluble and insoluble zinc compounds (i.e., ZnO, Zn(OH)₂, Zn₃(PO₄)₂, ZnCO₃, Zn, ZnS). However, considering that these substances have lower water solubility than ZnO, it can be conservatively assumed that the oral absorption of these compounds is ≤12%.

Acute toxicity

Zinc SHG

Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination
Oral	LD50	Equivalent or similar to OECD 401	>2000 mg/kg bw		Rat		Experimental value
Dermal	LD50	Equivalent or similar to OECD 402	>2000 mg/kg bw	24 weeks (daily, 5 days/week)	Rat		Read-across

Inhalation	LC50	Equivalent or similar to OECD 403	>5.41 mg/l	4 weeks (daily, 5 days/week)	Rat		Experimental value
Inhalation (ZnO, metallic fume)	LC50	Equivalent or similar to OECD 403	>5.7 mg/l	4 weeks (daily, 5 days/week)	Rat		Experimental value

Conclusion

Toxicity is only applicable when components are released.

Low acute toxicity by the dermal route.

Low acute toxicity by the oral route.

Low acute toxicity by the inhalation route.

Corrosion/irritation

Zinc SHG

Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination
Eye	Moderately irritating	Equivalent or similar to OECD 405			Rabbit	Experimental value
Dermal (ZnO, metallic fume)	Not irritating	Equivalent or similar to OECD 405			Rabbit	Experimental value
Dermal	Not irritating	Equivalent or similar to OECD 404			Rabbit	Weight of evidence
Dermal (ZnO, metallic fume)	Not irritating	Equivalent or similar to OECD 404			Guinea pig	Experimental value
Dermal	Not irritating	human observation			Human	Read-across
Dermal	Not irritating	human observation			Human	Read-across

Conclusion

Not classified as irritating to the skin.

Not classified as irritating to the eyes.

Respiratory or skin sensitisation

Zinc SHG

Route of exposure	Result	Method	Exposure time	Observation time point	Species	Gender	Value determination
Dermal	Negative	Equivalent or similar to OECD 429			Mouse		Read-across
Dermal (ZnO, metallic fume)	Negative	human observation			Human		
Inhalation	Negative						Inconclusive, insufficient data

Conclusion

Not sensitizing for inhalation.

Not sensitizing for skin.

Specific target organ toxicity

Zinc SHG

Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Gender	Value determination
Oral	NOAEL	Equivalent or similar to OECD 408	13.3 mg/kg bw/day	Blood	No effect	90 weeks (daily, 5 days/week)	Rat	Male/female	Read-across
Oral	NOAEL	Human observation study: case control study	50 mg/kg bw/day		No effect		Human	Male/female	Weight of evidence
Dermal	Not relevant, expert judgement								

Conclusion

Low sub-chronic toxicity by the dermal route.

Low sub-chronic toxicity by the oral route.

Low sub-chronic toxicity by inhalation route.

Carcinogenicity

Zinc SHG

Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination	Organ	Effect
Inhalation	No data available								
Dermal	No data available								
Oral	Negative	Other		51 weeks (daily, 5 days/week)	Rat		literature	General	No neoplastic effects
Oral	Negative	Human observation study: case control study		204 weeks (daily, 5 days/week)	Human		literature	General	No neoplastic effects

Conclusion CMR

Not classified for mutagenic or genotoxic toxicity.

Not classified for carcinogenicity.

Toxicity other effects

Zinc SHG

No data available.

Conclusion

No data available.

Other information

Zinc SHG

No data available.

SECTION 12: ECOLOGICAL INFORMATION
Toxicity:
Zinc SHG

	Parameter	Method	Value	Duration	Species	Test design	Fresh/salt water	Value determination
Acute toxicity fishes	LC50	ASTM	0.169 mg/l	96 h	Oncorhynchus mykiss	STATIC SYSTEM	Fresh water	Read-across
Acute toxicity fishes	LC50	Other	0.330-0.780 mg/l	96 h	Pimephales promelas	STATIC SYSTEM		Read-across
Acute toxicity invertebrates	EC50	US EPA	0.413 mg/l	48 h	Ceriodaphnia dubia	STATIC SYSTEM	Fresh water	Experimental value
Acute toxicity invertebrates	EC50	Equivalent or similar to OECD 202	0.530 mg/l	48 h	Daphnia magna	STATIC SYSTEM	Fresh water	Read-across
Acute toxicity invertebrates	EC50	Other	0.095-0.530 mg/l	48 h	Ceriodaphnia dubia	STATIC SYSTEM	Fresh water	Read-across
Toxicity algae and other aquatic plants	IC50	OECD 201	0.136 mg/l	72 h	Pseudokirchneriella subcapitata	STATIC SYSTEM	Fresh water	Experimental value
Toxicity algae and other aquatic plants	EC10	Other	0.0077 mg/l	7 day(s)		STATIC SYSTEM	Salt water	Experimental value
Toxicity algae and other aquatic plants	EC10	Other	0.6708 mg/l	10 day(s)	Algae	FLOW-THROUGH SYSTEM	Salt water	Read-across
Long-term toxicity fish	NOEC	Other	0.440 mg/l	72 day(s)	Oncorhynchus mykiss	FLOW-THROUGH SYSTEM	Fresh water	Read-across
Long-term toxicity fish	NOEC	Other	0.530 mg/l	36 month(s)	Salvelinus fontinalis	FLOW-THROUGH SYSTEM	Fresh water	Read-across
Long-term toxicity fish	NOEC	Other	0.025 mg/l	27 day(s)	Clupea harengus	Semi-static	Salt water	Read-across
Long-term toxicity aquatic invertebrates	NOEC	Other	0.400 mg/l	10 week(s)		STATIC SYSTEM	Fresh water	Read-across
Long-term toxicity aquatic invertebrates	NOEC	Other	0.037 mg/l	3 week(s)	Daphnia magna	Semi-static	Fresh water	Read-across
Long-term toxicity aquatic invertebrates	NOEC	US EPA	0.0056 mg/l	24 day(s)	Invertebrata	Semi-static	Salt water	Read-across
Toxicity aquatic micro-organisms	EC50	Equivalent or similar to OECD 209	5.2 mg/l	3 h		STATIC SYSTEM	Fresh water	Read-across

Toxicity sediment organisms	NOEC	ASTM	1135 mg/kg sediment dw	28 day(s)	Tubifex tubifex	FLOW-TH ROUGH SYSTEM	Fresh water	Read-across
Toxicity sediment organisms	NOEC	Other	201 mg/kg sediment dw	35 day(s)	Gammarus pulex	Semi-static	Fresh water	Read-across

	Parameter	Method	Value	Duration	Species	Value determination
Toxicity soil macro-organisms	NOEC	Other	1634 mg/kg soil dw	42 day(s)	Lumbricus terrestris	Read-across
Toxicity soil macro-organisms	EC10	OECD 220	35.7 mg/kg soil dw	42 day(s)	Enchytraeus albidus	Read-across
Toxicity soil micro-organisms	NOEC	Other	17 mg/kg soil dw	12 week(s)		Read-across
Toxicity soil micro-organisms	EC10		2623 mg/kg soil dw	6 week(s)		Read-across
Toxicity terrestrial plants	EC10	OECD 208	5855 mg/kg soil dw	21 day(s)	Triticum aestivum	Read-across
Toxicity terrestrial plants	NOEC	OECD 208	32 mg/kg soil dw	25 day(s)	Triticum pratense	Read-across
Toxicity birds	NOEC	Other	>150 mg/kg dw	28 day(s)	Anas platyrhynchos	Experimental value

Conclusion

Highly toxic to fishes.
 Very toxic to invertebrates.
 Highly toxic to aquatic plants.
 Toxic to bacteria.
 Ecotoxicity is only applicable when components are released.

Persistence and degradability:

Conclusion

Biodegradability: not applicable.

Mobility in soil:

Zinc SHG

Volatile organic compounds (VOC)	Not applicable
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Conclusion

Literature reports: insoluble in water.
 Substance sinks in water.

Results of PBT and vPvB assessment:

Substance does not meet the screening criteria for persistency nor bioaccumulation so is neither PBT nor vPvB.

Other adverse effects:

Zinc SHG

Global warming potential (GWP)

Not data available.

Ozone-depleting potential (ODP)

Ozone layer	Not dangerous for the ozone layer (Council Regulation (EC) No. 1005/2009)
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SECTION 13: DISPOSAL CONSIDERATIONS

The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.

Waste treatment methods:

Disposal methods

Recycle/reuse. Remove waste in accordance with local and/or national regulations.

Packaging/Container

No data available.

SECTION 14: TRANSPORTATION INFORMATION

Not regulated.

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture:

European legislation:

Chemical safety assessment:

A chemical safety assessment has been performed.

SECTION 16: OTHER INFORMATION

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