



# SAFETY DATA SHEET

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Version ' 1

## Section 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identifier

**Product Code** SAC017  
*Product Name* Zirconium/Magnesium: Compacts, Turnings, Chips

**UN/ID no** 3089  
**Synonyms** Zirconium sponge compacts (distilled), Zirconium/ Magnesium from the Kroll Process (Product #309)

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

**Recommended Use** Alloy product manufacture

**Uses advised against**

### 1.3. Details of the supplier of the safety data sheet

**Manufacturer Address**  
ATI, 1000 Six PPG Place, Pittsburgh, PA 15222 USA

### 1.4. Emergency telephone number

**Emergency Telephone** Chemtrec: +1-703-741-5970

## Section 2: HAZARDS IDENTIFICATION

### 2.1. Classification of the substance or mixture

*Regulation (EC) No 1272/2008*

Flammable solids	Category 1
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### 2.2. Label elements

#### Emergency Overview

**Danger**

**Hazard statements**

Flammable solids



**Appearance** Chunks

**Physical state** Solid; Powder

**Odour** Odourless

**Precautionary Statements - Prevention**

Wear protective gloves/protective clothing/eye protection  
 Keep away from heat/sparks/open flames/hot surfaces. - No smoking  
 Ground/bond container and receiving equipment  
 Use explosion-proof electrical/ventilating/lighting/equipment if dust clouds can occur

**Precautionary Statements - Response**

In case of fire: Use salt (NaCl) or class D dry powder for extinction

**2.3 Hazards not otherwise classified (HNOC)**

Not applicable

**Other Information**

When product is subjected to welding, burning, melting, sawing, brazing, grinding, buffing, polishing, or other similar heat-generating processes, the following potentially hazardous airborne particles and/or fumes may be generated zinc, copper, magnesium, or cadmium fumes may cause metal fume fever.

**Section 3: COMPOSITION/INFORMATION ON INGREDIENTS**

**3.1 Substances**

**Synonyms** Zirconium sponge compacts (distilled), Zirconium/ Magnesium from the Kroll Process (Product #309).

Chemical Name	EC No	CAS No	Weight-%
Zirconium	231-176-9	7440-67-7	55-65
Magnesium	231-104-6	7439-95-4	35-40
Magnesium Chloride	232-094-6	7786-30-3	1-5

**Section 4: FIRST AID MEASURES**

**4.1. Description of first aid measures**

**Inhalation** If excessive amounts of smoke, fume, or particulate are inhaled during processing, remove to fresh air and consult a qualified health professional.

**Skin Contact** None under normal use conditions.

**Eye contact** In the case of particles coming in contact with eyes during processing, treat as with any foreign object.

**Ingestion** IF SWALLOWED. Call a POISON CENTER or doctor/physician if you feel unwell.

**4.2. Most important symptoms and effects, both acute and delayed**

**Symptoms** None anticipated.

**4.3. Indication of any immediate medical attention and special treatment needed**

**Note to doctors** Treat symptomatically.

**Section 5: FIRE FIGHTING MEASURES**

**5.1. Extinguishing media**

**Suitable extinguishing media**

Smother with salt (NaCl) or class D dry powder fire extinguisher.

**Unsuitable extinguishing media**

Do not spray water on burning metal as an explosion may occur. This explosive characteristic is caused by the hydrogen and steam generated by the reaction of water with the burning material

**5.2. Special hazards arising from the substance or mixture**

Intense heat. Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite spontaneously at room temperature **WARNING:** Fine particles resulting from grinding, buffing, polishing, or similar processes of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimise combustible dust hazard.

**Hazardous combustion products** zinc, copper, magnesium, or cadmium fumes may cause metal fume fever.

**5.3. Advice for firefighters**

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

**Section 6: ACCIDENTAL RELEASE MEASURES**

**6.1. Personal precautions, protective equipment and emergency procedures**

**Personal precautions**

Use personal protective equipment as required.

**For emergency responders**

Use personal protective equipment as required. Follow Emergency Response Guidebook, Guide No. 170.

**6.2. Environmental precautions**

Collect spillage to prevent release to the environment.

**6.3. Methods and material for containment and cleaning up**

**Methods for containment**

Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up**

Sweep or shovel material into dry containers. Avoid creating uncontrolled dust.

**6.4. Reference to other sections**

See Section 12: ECOLOGICAL INFORMATION.

**Section 7: HANDLING AND STORAGE**

**7.1. Precautions for safe handling**

**Advice on safe handling**

Very fine, high surface area material resulting from grinding, buffing, polishing, or similar processes of this product may ignite spontaneously at room temperature. **WARNING:** Fine particles resulting from grinding, buffing, polishing, or similar processes of this product may form combustible dust-air mixtures. Keep particles away from all ignition sources including heat, sparks, and flame. Prevent dust accumulations to minimise combustible dust hazard.

**General Hygiene Considerations**

Handle in accordance with good industrial hygiene and safety practice.

**7.2. Conditions for safe storage, including any incompatibilities**

**Storage Conditions**

Keep chips, turnings, dust, and other small particles away from heat, sparks, flame and other sources of ignition (i.e., pilot lights, electric motors and static electricity).

**Incompatible materials**

Dissolves in hydrofluoric acid. Ignites in the presence of fluorine. When heated above 200°C, reacts exothermically with the following. Chlorine, bromine, halocarbons, carbon tetrachloride, carbon tetrafluoride, and freon.

**7.3. Specific end use(s)****Risk Management Methods (RMM)**

The information required is contained in this Safety Data Sheet.

**Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION****8.1. Control parameters**

Chemical Name	European Union	United Kingdom	France	Spain	Germany
Zirconium 7440-67-7	-	TWA: 5 mg/m <sup>3</sup>	-	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	TWA: 1 mg/m <sup>3</sup> Ceiling / Peak: 1 mg/m <sup>3</sup>
Magnesium 7439-95-4	-	-	-	-	-
Magnesium Chloride 7786-30-3	-	-	-	-	-
Chemical Name	Italy	Portugal	Netherlands	Finland	Denmark
Zirconium 7440-67-7	-	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	-	TWA: 1 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>
Magnesium 7439-95-4	-	-	-	-	-
Magnesium Chloride 7786-30-3	-	-	-	-	-
Chemical Name	Austria	Switzerland	Poland	Norway	Ireland
Zirconium 7440-67-7	TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup>	STEL: 10 mg/m <sup>3</sup> TWA: 5 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>	TWA: 5 mg/m <sup>3</sup> STEL: 10 mg/m <sup>3</sup>
Magnesium 7439-95-4	-	-	-	-	-
Magnesium Chloride 7786-30-3	-	-	-	-	-

**Derived No Effect Level (DNEL)** No DNELs are available for this product as a whole

**Predicted No Effect Concentration (PNEC)** No PNECs are available for this product as a whole.

**8.2. Exposure controls**

**Engineering Controls** Avoid generation of uncontrolled particles.

**Personal protective equipment****Eye/face protection**

When airborne particles may be present, appropriate eye protection is recommended. For example, tight-fitting goggles, foam-lined safety glasses or other protective equipment that shield the eyes from particles.

**Skin and body protection**

Wear fire/flammable resistant/retardant clothing. Cut-resistant gloves and/or protective clothing may be appropriate when sharp surfaces are present.

**Respiratory protection**

When particulates/fumes/gases are generated and if exposure limits are exceeded or irritation is experienced, proper approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

**Environmental exposure controls** Section 6: ACCIDENTAL RELEASE MEASURES.

**Section 9: PHYSICAL AND CHEMICAL PROPERTIES**

**9.1. Information on basic physical and chemical properties**

<b>Physical state</b>	Solid; Powder	<b>Odour</b>	Odourless
<b>Appearance</b>	Chunks	<b>Odour threshold</b>	Not applicable
<b>Colour</b>	grey Silver		

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	-	
Melting point/freezing point	1850 °C / 3360 °F	
Boiling point / boiling range	-	
Flash point	-	
Evaporation rate	-	Not applicable
Flammability (solid, gas)	-	Flammable
Flammability Limit in Air		
Upper flammability limit:	-	
Lower flammability limit	-	
Vapour pressure	-	Not applicable
Vapour density	-	Not applicable
Specific Gravity	4	
Water solubility	Insoluble	
Solubility(ies)		Not applicable
Partition coefficient	-	Not applicable
Autoignition temperature	-	Not applicable
Decomposition temperature	-	Not applicable
Kinematic viscosity	-	Not applicable
Dynamic viscosity	-	Not applicable
Explosive properties	Not applicable	
Oxidising properties	Not applicable	

**9.2. Other information**

Softening point	-
Molecular weight	-
VOC Content (%)	Not applicable
Density	-
Bulk density	100lb/ft3

**Section 10: STABILITY AND REACTIVITY**

**10.1. Reactivity**

Not applicable

**10.2. Chemical stability**

Stable under normal conditions.

Explosion data

Sensitivity to Mechanical Impact	None.
Sensitivity to Static Discharge	None.

**10.3. Possibility of hazardous reactions**

**Hazardous polymerisation**

Hazardous polymerisation does not occur.

**Possibility of Hazardous Reactions**

None under normal processing.

**10.4. Conditions to avoid**

Dust formation and dust accumulation.

**10.5. Incompatible materials**

Dissolves in hydrofluoric acid. Ignites in the presence of fluorine. When heated above 200°C, reacts exothermically with the following. Chlorine, bromine, halocarbons, carbon tetrachloride, carbon tetrafluoride, and freon.

**10.6. Hazardous decomposition products**

Not applicable.

**Section 11: TOXICOLOGICAL INFORMATION****11.1. Information on toxicological effects****Product Information**

<b>Inhalation</b>	Product not classified.
<b>Eye contact</b>	Product not classified.
<b>Skin Contact</b>	Product not classified.
<b>Ingestion</b>	Product not classified.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Zirconium	> 5000 mg/kg bw	-	>4.3 mg/L
Magnesium	>2000 mg/kg bw	-	-
Magnesium Chloride	5000 mg/kg bw	>2000 mg/kg bw	-

**Information on toxicological effects**

**Symptoms** None known.

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

<b>Acute toxicity</b>	Product not classified.
<b>Skin corrosion/irritation</b>	Product not classified.
<b>Serious eye damage/eye irritation</b>	Product not classified.
<b>Sensitisation</b>	Product not classified.
<b>Germ cell mutagenicity</b>	Product not classified.
<b>Carcinogenicity</b>	Product not classified.
<b>Reproductive toxicity</b>	Product not classified.
<b>STOT - single exposure</b>	Product not classified.
<b>STOT - repeated exposure</b>	Product not classified.
<b>Aspiration hazard</b>	Product not classified.

**Section 12: ECOLOGICAL INFORMATION****12.1. Toxicity**

This product as shipped is not classified for aquatic toxicity

Chemical Name	Algae/aquatic plants	Fish	Toxicity to Micro-organisms	Crustacea
Zirconium	The 14 d NOEC of	The 96 h LL50 of	-	The 48 h EC50 of

	zirconium dichloride oxide to <i>Chlorella vulgaris</i> was greater than 102.5 mg of Zr/L.	zirconium to <i>Danio rerio</i> was greater than 74.03 mg/L.		zirconium dioxide to <i>Daphnia magna</i> was greater than 74.03 mg of Zr/L.
Magnesium	The 72 h EC50 of magnesium chloride hexahydrate to <i>Desmodesmus subspicatus</i> was greater than 12 mg of Mg/L.	The 96 h LC50 of magnesium chloride to <i>Pimephales promelas</i> was 541 mg of Mg/L.	The 3 h EC50 of magnesium chloride hexahydrate for activated sludge was greater than 108 mg of Mg/L.	The 48 h LC50 of magnesium chloride to <i>Ceriodaphnia dubia</i> was 225 mg of Mg/L. The 48 h LC50 of magnesium chloride hexahydrate to <i>Daphnia magna</i> was 322 mg of Mg/L.
Magnesium Chloride	The 72 h EC50 of magnesium chloride to <i>Desmodesmus subspicatus</i> was greater than 100 mg of MgCl <sub>2</sub> /L.	The 96 h LC50 of magnesium chloride to <i>Pimephales promelas</i> was 2119.3 mg of MgCl <sub>2</sub> /L.	The 3 h EC50 of magnesium chloride for activated sludge was greater than 900 mg of MgCl <sub>2</sub> /L.	The 48 h LC50 of magnesium chloride hexahydrate to <i>Daphnia magna</i> was 548.4 mg of MgCl <sub>2</sub> /L.

**12.2. Persistence and degradability**

**12.3. Bioaccumulative potential**

**12.4. Mobility in soil**

**12.5. Results of PBT and vPvB assessment**

The PBT and vPvB criteria do not apply to inorganic substances.

**12.6. Other adverse effects**

**Section 13: DISPOSAL CONSIDERATIONS**

**13.1. Waste treatment methods**

<b>Waste from residues/unused products</b>	Disposal should be in accordance with applicable regional, national and local laws and regulations.
<b>Contaminated packaging</b>	Disposal should be in accordance with applicable regional, national and local laws and regulations.

**Section 14: TRANSPORT INFORMATION**

**IMDG**

<b>14.1 UN/ID no</b>	3089
<b>14.2 Proper shipping name</b>	Metal powders, flammable, n.o.s. (Zirconium Magnesium)
<b>14.3 Hazard Class</b>	4.1
<b>14.4 Packing Group</b>	II
<b>14.5 Marine pollutant</b>	Not applicable
<b>14.6 Special Provisions</b>	IB8, IP2, IP4, T3, TP33
<b>14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	Not applicable

**RID**

<b>14.1 UN/ID no</b>	3089
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14.2 Proper shipping name Metal powders, flammable, n.o.s. (Zirconium Magnesium)  
 14.3 Hazard Class 4.1  
 14.4 Packing Group II  
 14.5 Environmental hazard Not applicable  
 14.6 Special Provisions IB8, IP2, IP4, T3, TP33

**ADR**

14.1 UN/ID no 3089  
 14.2 Proper shipping name Metal powders, flammable, n.o.s. (Zirconium Magnesium)  
 14.3 Hazard Class 4.1  
 14.4 Packing Group II  
 14.5 Environmental hazard Not applicable  
 14.6 Special Provisions IB8, IP2, IP4, T3, TP33

**ICAO (air)**

14.1 UN/ID no 3089  
 14.2 Proper shipping name Metal powders, flammable, n.o.s. (Zirconium Magnesium)  
 14.3 Hazard Class 4.1  
 14.4 Packing Group II  
 14.5 Environmental hazard Not applicable  
 14.6 Special Provisions IB8, IP2, IP4, T3, TP33

**IATA**

14.1 UN/ID no 3089  
 14.2 Proper shipping name Metal powders, flammable, n.o.s. (Zirconium Magnesium)  
 14.3 Hazard Class 4.1  
 14.4 Packing Group II  
 Description .  
 14.5 Environmental hazard Not applicable  
 14.6 Special Provisions IB8, IP2, IP4, T3, TP33 170  
**ERG Code**

**Section 15: REGULATORY INFORMATION**

**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

Chemical Name	French RG number	Title
Zirconium 7440-67-7	-	-
Magnesium 7439-95-4	-	-
Magnesium Chloride 7786-30-3	-	-

**European Union**

Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

**Authorisations and/or restrictions on use:**

This product does not contain substances subject to authorisation (Regulation (EC) No. 1907/2006 (REACH), Annex XIV). This product does not contain substances subject to restriction (Regulation (EC) No. 1907/2006 (REACH), Annex XVII).

**International Inventories**

DSL/NDSL Complies  
 EINECS/ELINCS Complies  
 ENCS Complies  
 IECSC Complies  
 KECL Complies  
 PICCS Complies



AICS Complies

**Legend:**

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory  
DSL/NDL - Canadian Domestic Substances List/Non-Domestic Substances List  
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances  
ENCS - Japan Existing and New Chemical Substances  
IECSC - China Inventory of Existing Chemical Substances  
KECL - Korean Existing and Evaluated Chemical Substances  
PICCS - Philippines Inventory of Chemicals and Chemical Substances  
AICS - Australian Inventory of Chemical Substances

**15.2. Chemical safety assessment**

No chemical safety assessment has been performed for this product.

**Section 16: OTHER INFORMATION**

Issue Date 08-Jul-2015  
Revision Date 05-Dec-2016  
Revision Note Updated Section(s): 1, 2, 6, 9, 12, 14.

**This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006**

**Note:**

The information provided in this Material Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

**End of Safety Data Sheet**

**Additional information available from:** Safety data sheets and labels available at ATImetals.com