



## Safety Data Sheet

### 1. Identification of the substance/mixture and of the company/undertaking

#### Product identifier:

Product name: Devarda's alloy, powder

SDS No. : 2155E-2

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

Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.

Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN

Division: Safety Management Dept. of Chemicals

Telephone number: +81-6-6946-8061

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e-mail address: kagakuhinanzenkanri@kishida.co.jp

### 2. Hazards identification

#### GHS classification and label elements of the product

#### Classification of the substance or mixture

##### PHYSICAL AND CHEMICAL HAZARDS

Flammable solids: Category 1

##### HEALTH HAZARDS

Skin sensitization: Category 1A

Specific target organ toxicity – single exposure: Category 1 (gastrointestinal tract; respiratory system)

Specific target organ toxicity – single exposure: Category 3 (Respiratory tract irritation)

Specific target organ toxicity – repeated exposure: Category 1 (respiratory system)

##### ENVIRONMENT HAZARDS

Hazardous to the aquatic environment (Acute): Category 2

Hazardous to the aquatic environment (Long-term): Category 2

#### Label elements



Signal word: Danger

#### HAZARD STATEMENT

Flammable solid

May cause an allergic skin reaction

Causes damage to organs after single exposure (gastrointestinal tract; respiratory system)

May cause respiratory irritation

Causes damage to organs through prolonged or repeated exposure (respiratory system)

Toxic to aquatic life

Toxic to aquatic life with long lasting effects

#### PRECAUTIONARY STATEMENT

##### Prevention

Avoid release to the environment.

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment.

Do not breathe dust/fume/gas/mist/vapors/spray.

Use only outdoors or in a well-ventilated area.



Wash contaminated parts thoroughly after handling.  
Contaminated work clothing should not be allowed out of the workplace.  
Wear protective gloves/protective clothing/eye protection/face protection.  
Do not eat, drink or smoke when using this product.

**Response**

In case of fire: Use appropriate media other than water for extinction.  
Collect spillage.  
Get medical advice/attention if you feel unwell.  
IF exposed or concerned: Call a POISON CENTER or doctor/physician.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
IF ON SKIN: Wash with plenty of soap and water.  
If skin irritation or rash occurs: Get medical advice/attention.  
Take off contaminated clothing and wash it before reuse.

**Storage**

Store in a well-ventilated place. Keep container tightly closed.

**Disposal**

Dispose of contents/container in accordance with local/national regulation.

**Specific Physical and Chemical hazards**

Flammable solid. Vapor/air mixture may explode.

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**3. Composition/information on ingredients****Mixture/Substance selection:****Mixture**

Ingredient name:Copper

Content (%):50

Chemical formula:Cu

CAS No.:7440-50-8

MW:63.5

ECNO:231-159-6

Ingredient name:Aluminium

Content (%):45

Chemical formula:Al

CAS No.:7429-90-5

MW:26.98

ECNO:231-072-3

Ingredient name:Zinc

Content (%):5.0

Chemical formula:Zn

CAS No.:7440-66-6

MW:65.409

ECNO:231-175-3

Note : The figures shown above are not the specifications of the product.

**Supplementary information concerning ingredients**

Devarda's Alloy <100% (CAS No.8049-11-4)



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#### 4. First-aid measures

##### Descriptions of first-aid measures

##### General measures

Get medical attention/advice if you feel unwell.

##### IF INHALED

Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER or doctor/physician if you feel unwell.

##### IF ON SKIN (or hair)

Take off immediately all contaminated clothing. Rinse skin with water/shower.

Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical advice/attention.

##### IF IN EYES

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

##### IF SWALLOWED

Rinse mouth.

Call a POISON CENTER or doctor/physician if you feel unwell.

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#### 5. Fire-fighting measures

##### Extinguishing media

##### Suitable extinguishing media

Use appropriate extinguishing media suitable for surrounding facilities.

##### Unsuitable extinguishing media

Unsuitable extinguishing media data is not available.

##### Specific hazards arising from the substance or mixture

Containers may explode when heated.

Fire may produce irritating, corrosive and/or toxic gases.

##### Advice for firefighters

##### Specific fire-fighting measures

Evacuate non-essential personnel to safe area.

##### Special protective equipment and precautions for fire-fighters

Wear fire/flame resistant/retardant clothing.

Wear protective gloves/protective clothing/eye protection/face protection.

Firefighters should wear self-contained breathing apparatus with full face piece operated positive pressure mode.

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#### 6. Accidental release measures

##### Personnel precautions, protective equipment and emergency procedures

Ventilate area until material pick up is complete.

Wear proper protective equipment.

##### Environmental precautions

Prevent spills from entering sewers, watercourses or low areas.

Avoid raising dust.

##### Methods and materials for containment and cleaning up

Sweep up, place in a bag and hold for waste disposal.

##### Preventive measures for secondary accident

Collect spillage.



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## 7. Handling and storage

### Precautions for safe handling

#### Preventive measures

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

#### Safety Measures

Use only outdoors or in a well-ventilated area.

Wear protective gloves/protective clothing/eye protection/face protection.

When using do not eat, drink or smoke.

#### Any incompatibilities

See "10.Stability and Reactivity"

#### Advice on general occupational hygiene

Wash contaminated parts thoroughly after handling.

Do not eat, drink or smoke when using this product.

Contaminated work clothing should not be allowed out of the workplace.

Take off contaminated clothing and wash it before reuse.

#### Storage

##### Conditions for safe storage

Keep container tightly closed.

Store in a cool, dry place. Do not store in direct sunlight.

##### Container and packaging materials for safe handling

Glass

Polyethylene

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## 8. Exposure controls/personal protection

### Control parameters

#### Adopted value

(Copper)

ACGIH(1990) TWA: 0.2mg-Fume/m<sup>3</sup>,

TWA: 1mg-Dust and mist/m<sup>3</sup> (Irr; GI; metal fume fever)

(Aluminium)

ACGIH(2007) TWA: 1mg/m<sup>3</sup>(R) (Pneumoconiosis; LRT irr; neurotoxicity)

#### OSHA-PEL

(Aluminium)

TWA: 15mg-Al/m<sup>3</sup> (Total dust)

TWA: 5mg-Al/m<sup>3</sup> (Respirable fraction)

(Copper)

TWA: 0.1mg-Cu/m<sup>3</sup> (Fume)

TWA: 1mg-Cu/m<sup>3</sup> (Dusts and mists)

### Exposure controls

#### Appropriate engineering controls

Do not use in areas without adequate ventilation.

Eye wash station should be available.



Washing facilities should be available.

Individual protection measures

Respiratory protection

Wear respiratory protection.

Hand protection

Wear protective gloves.

Eye protection

Wear eye/face protection.

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## 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Powder

Color: Gray

Odor: Odorless

Melting point/Freezing point data is not available.

Boiling point or initial boiling point data is not available.

Boiling range data is not available.

Flammability (gases, liquids and solids) data is not available.

Lower and upper explosion limit/flammability limit data is not available.

Flash point data is not available.

Auto-ignition temperature data is not available.

Decomposition temperature data is not available.

pH data is not available.

Kinematic viscosity data is not available.

Solubility:

Solubility in water: Insoluble

n-Octanol/water partition coefficient data is not available.

Vapor pressure data is not available.

Density and/or relative density: about 6 (20°C)

Relative vapor density (Air=1) data is not available.

No Particle characteristics data is not available.

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## 10. Stability and Reactivity

Reactivity

Not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

(Copper)

Mixtures with acetylenic compounds, ethylene oxide and azides are shock-sensitive. Reacts with strong oxidants such as chlorates, bromates and iodates. This generates explosion hazard. (ICSC 0240)

(Aluminium)

Ignites in air when finely divided. Dust explosion possible if in powder or granular form, mixed with air.

Reacts with water and alcohols. Reacts violently with oxidants, strong acids, strong bases, chlorinated hydrocarbons and halogens. This generates fire and explosion hazard. (ICSC 0988)

(Zinc)

Ignites in air when finely divided. If dry, it can be charged electrostatically by swirling, pneumatic transport, pouring, etc.

On combustion forms zinc oxide fumes. The substance is a strong reducing agent. It reacts



violently with oxidants, acids and bases. Reacts with water. This produces flammable/explosive gas (hydrogen). Reacts violently with sulfur, halogenated hydrocarbons and many other substances. This generates fire and explosion hazard. (ICSC 1205)

**Conditions to avoid**

Contact with incompatible materials.  
Contact with fire source.

**Incompatible materials**

Acids, Bases, Oxidizing agents, Water, Alcohols, Chlorinated hydrocarbons, Halogens, Sulfur, Halogenated hydrocarbons

**Hazardous decomposition products**

Zinc oxide, Hydrogen

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**11. Toxicological Information****Information on toxicological effects**

Acute toxicity data is not available.

**Irritant properties**

Skin corrosion/irritation data is not available.

**Serious eye damage/irritation**

[GHS Cat. Japan, base data]

(Zinc)

rabbit mild irritation (NITE primary risk assessment, 2007)

**Sensitization****Skin sensitization**

[GHS Cat. Japan, base data]

(Copper)

cat. 1A; JSOH recommendation, 2012

Mutagenic effects data is not available.

**Carcinogenicity**

(Aluminium)

ACGIH-A4(2007) : Not Classifiable as a Human Carcinogen

Reproductive toxicity data is not available.

**STOT****STOT-single exposure**

[cat.1]

[GHS Cat. Japan, base data]

(Copper)

gastrointestinal tract (ATSDR, 2004)

(Aluminium)

respiratory system (ACGIH 7th, 2008)

[cat.3 (resp. irrit.)]

[GHS Cat. Japan, base data]

(Copper)

respiratory tract irritation (ATSDR, 2004)

**STOT-repeated exposure**

[cat.1]

[GHS Cat. Japan, base data]

(Aluminium)

respiratory system (ACGIH 7th, 2008)

Aspiration hazard data is not available.

**Information on other hazards**

May cause lung disorders by massive inhalation of powdered substance.

-e.g. fibrosis of lung tissue, cough, sputum, breath shortness, dyspnea, decline of lung function, interstitial lung disease, pneumothorax



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## 12. Ecological Information

### Ecotoxicity

#### Aquatic toxicity

Toxic to aquatic life

Toxic to aquatic life with long lasting effects

Hazardous to the aquatic environment (Acute)

[GHS Cat. Japan, base data]

(Zinc)

Algae (*Pseudokirchneriella subcapitata*) ErC50=0.15mg/L/72hr (EHC 221, 2001)

#### Water solubility

(Aluminium)

none, reaction (ICSC, 2000)

(Copper)

none (ICSC, 1993)

(Zinc)

reaction (ICSC, 1994)

#### Persistence and degradability

Persistence and degradability data is not available.

#### Bioaccumulative potential

Bioaccumulative potential data is not available.

#### Mobility in soil

Mobility in soil data is not available.

#### Other adverse effects

Ozone depleting chemical data is not available.

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## 13. Disposal considerations

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

#### Waste treatment methods

Avoid release to the environment (- if this is not the intended use).

Dispose of contents/container in accordance with local/national regulation.

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## 14. Transport Information

UN No. or ID No.: 3089

UN Proper Shipping Name :

METAL POWDER, FLAMMABLE, N.O.S.

Class or division (Transport hazard class) : 4.1

Packing group : II

ERG GUIDE No.: 170

#### IMDG Code (International Maritime Dangerous Goods Regulations)

UN No.: 3089

Proper Shipping Name :

METAL POWDER, FLAMMABLE, N.O.S.

Class or division : 4.1

Packing group : II

#### IATA Dangerous Goods Regulations

UN No.: 3089

Proper Shipping Name :

METAL POWDER, FLAMMABLE, N.O.S.

Class or division : 4.1

Hazard labels : Flamm.solid



Packing group : II  
Special provisions No.: A3; A803

Environmental hazards

MARPOL Annex III – Prevention of pollution by harmful substances  
Marine pollutants (yes/no) : yes  
MARPOL Annex V – Prevention of pollution by garbage discharge  
Specific target organ toxicity – repeated exposure: cat.1  
Aluminium  
Hazardous to the aquatic environment – long-term hazard: cat.1, 2  
Zinc

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15. Regulatory Information

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

Chemicals listed in TSCA Inventory

Aluminium; Copper; Zinc

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

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16. Other information

GHS classification and labelling

Flam. Sol. 1: H228 Flammable solid

Skin Sens. 1A: H317 May cause an allergic skin reaction

STOT SE 1: H370 Causes damage to organs after single exposure

STOT SE 3: H335 May cause respiratory irritation

STOT RE 1: H372 Causes damage to organs through prolonged or repeated exposure

Aquatic Acute 2: H401 Toxic to aquatic life

Aquatic Chronic 2: H411 Toxic to aquatic life with long lasting effects

Reference Book

Globally Harmonized System of classification and labelling of chemicals, UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 21th edit., 2019 UN

IMDG Code, 2018 Edition (Incorporating Amendment 39-18)

IATA Dangerous Goods Regulations (62nd Edition) 2021

2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2020 TLVs and BEIs. (ACGIH)

Supplier's data/information

General Disclaimer

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2019).