



SAFETY DATA SHEET

1. Chemical Product and Company Identification

Product Name : **DIA-440**
General Use : For silver brazing operation
SDS № : **201-26**
Manufacturer : Mizuno Handy Harman, Ltd.
Sales Dept. : 2-11-12, Kitaueno, Taitoh-Ku, Tokyo, Japan
(Phone/Fax №: +81-3-3844-6166 / +81-3-3845-5702)
Technical Dept. : 13-38 Noborito-cho, Koshigaya-shi, Saitama , Japan
(Phone/Fax №: +81-489-86-9151 / +81-489-86-9153)
Emergency phone number : +81-489-86-9151

2. Hazards Identification

Classification(s)

Acute Toxicity, Inhalation: Hazard Category 3
Carcinogenicity: Hazard Category 1
Reproductive Toxicity: Hazard Category 2
Germ Cell Mutagenicity: Hazard Category 2

Label Symbol(s): Skull & Crossbones, Health Hazard

Label Signal Word(s): Danger

Label Hazard Statement(s):

Toxic if inhaled.
May cause cancer.
Suspected of damaging fertility or the unborn child.
Suspected of causing genetic defects.



Label Precautionary Statement(s):

Do not handle until all safety precautions have been read and understood.
Obtain special instructions before use.
Avoid breathing dust or fumes.
Use only outdoors or in a well-ventilated area. Store locked up.

Wear protective gloves and eye / face protection.

If skin irritation or rash occurs, get medical advice or attention.

If exposed or concerned, get medical advice/ attention.

The acute toxicities of 10-90% of the product's ingredients are unknown.

Warning: These products contain chemicals known to the State of California to cause cancer.

3. Composition, Information on Ingredients

* Chemical Name and synonyms: Ag, Cu, Zn, Cd, Brazing Filler Metal

* Chemical Family: Brazing Filler Metal

Table 1: Components

Ingredient Name (Chemical Formula)	CAS # (*1)	WT %
Silver (Ag)	7440-22-4	40
Copper (Cu)	7440-50-8	20
Zinc (Zn)	7440-66-6	14
Cadmium (Cd)	7440-43-9	26

* Chemical Formula: Metal Alloy

* Gazette Reference №: Please refer to Article 16.

Table 2: Exposure Guidelines

Substances (Chemical Formula)	CAS #	ACGIH (*2), TLV-TWA (*3)
Silver Fume (Ag)	7440-22-4	Please refer to Article 8
Copper Fume (Cu)	7440-50-8	Ditto
Zinc Oxide Fume (Zn)	1314-13-2	Ditto
Cadmium (Cd)	7440-43-9	Ditto

<*1> <*2> <*3>: Please refer to Article 16 (Other Information)

4. First Aid Measures

* Eye contact: Wash immediately with plenty of water.

* Skin contact: Wash with plenty of soap.

* Inhalation: Remove individual from area to fresh air, blow the nose and gargle the throat.

* Ingestion: Clean the stomach with water.

* In any case, seek medical assistance immediately.

5. Fire Fighting

Non-flammable

6. Accidental Release Measures

* Personal precautions, protective equipment, and emergency procedures

Avoid contact with skin, eyes, and mucous membranes.

* Environmental precautions

Prevent spills from entering sewers or contaminating soil.

* Methods and materials for containment and methods and materials for cleaning up.

If a finely divided form of product is spilled, clean up spillage to minimize dispersion of dust. Either wet sweeping or vacuuming using HEPA filtration is recommended.

7. Handling and Storage

Handling: Humidity is not preferable as it will cause oxides on its surface.

Storage: Keep in store and avoid fire, water, and acids.

8. Exposure Controls / Personal Protections

* Control Value: Not established

* Exposure Guidelines

	Silver	Copper	Zinc	Cadmium
JCGIH <*4> in 2002	0.01 mg/m ³	Not available	Not available	0.05mg/m ³
ACGIH TLV-TWA	0.1 mg/m ³ (Dust & Fume)	1 mg/m ³ (Dust & Fume) 0.2 mg/m ³ (Fume)	5 mg/m ³ (Fume) 10 mg/m ³ (Dust)	0.01mg/m ³ (Fume)
TLV-STEL <*5>	Not available	0.2 mg/m ³ (Fume)	10 mg/m ³ (Fume)	Not available
OSHA <*6> PEL<*7> TWA	0.01 mg/m ³	0.1 mg/m ³ (Fume)	5 mg/m ³ (Fume)	5 µg/m ³
NIOSH <*8> PEL TWA	Not available	Not available	5 mg/m ³ 15 mg/m ³ /15M (Max Limit)	9mg/m ³
MSHA <*9> TWA	0.01 mg/m ³	0.1 mg/m ³	5 mg/m ³	9mg/m ³

Protection measures

* Equipment: Use at the place where ventilators are equipped.

* Protection: Use protective respirator, glasses, gloves, and clothes, if preferable

9. Physical and Chemical Properties

* Appearance: White yellow colour

- * Flow point: 667 °C
- * Melting point: 619°C
- * Specific gravity: 9.6
- * Explosion: Non-explosive
- * Solubility in water: Insoluble

10. Stability and Reactivity

- * Soluble in sub-nitric acid and hot concentrated sulfuric acid
- * Insoluble with alkali water

11. Toxicological Information

	Silver	Copper	Zinc (Zinc Oxide)	Cadmium
Mutagenicity	Not available	Not available	Rat: Positive Inhalation: Chromosome Aberration	Not available
Reproductive Effects	Not available	Rat TDLo <*10> 152 mg/Kg (22 W Pre)	Not available	Not available
Acute Toxicity (RTECS<*11>)	Rat LD<*12> >10g/Kg	Human TDLo 0.12 mg/Kg	Rat LD ₅₀ 2000 mg/Kg	Rat LD ₅₀ 1140mg/Kg
Oral Toxicity	Guinea Pig LD: >5 g/Kg	Rat LD ₅₀ <*13>:3.5mg/Kg		
Inhalation Toxicity	Not available	Not available	Human TCLo <*14> 600 mg/m ³ Rat LC ₅₀ <*15> 2500mg/Kg	Not available
Chronic Toxicity	Not available	Not available	Not available	Not available
Sub-Acute Toxicity	Shivers and Fevers (metallic fever) for a few hours by breathing metallic vapour	the same as silver	the same as silver, copper	The same as silver.
Sensitive Toxicity	Not available	Skin-sensitize. Group2 (JCGIH)	Not available	Not available

Irritation Scores	Not available	Not available	Not available	Not available
Carcinogenicity	Not available	EPA<*16>: D	EPA: D	Germ cell mutagen group: 3A

12. Ecological Information

- * Decomposition: Not available
- * Accumulation: Not available
- * Fish toxicity: Not available
- * Other information: Not available

13. Disposal Considerations

Dispose or ask collecting dealer in accordance with related regulations and law.

14. Transportation Information

- * UN classification: 6.1
- * UN Number: 2570
- * Necessary measures are taken to avoid toppling and fall-down of cargoes

15. Regulatory Information

	Occupational Safety and Health Law	Disposal and Cleaning Control Law on Waste	Chemical Substances Control Law (Chemical Substance Article 2-1)	Regulation on PRTR <*17>	Firefighting Law
Silver (Ag)	№ 138/631	Metal Scrap (№ 6/13)	№ 64/354	Not applicable	Not applicable
Copper (Cu)	№ 378/631	Not applicable	Not applicable	Drainage Standard: 3 mg/l	Not applicable
Zinc (Zn)	Not applicable	Not applicable	Not applicable	Drainage Standard: 5 mg/l	Hazardous Substance Class: 3
Cadmium (Cd)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

16. Other Information

Use of Fluxes

This product is often used together with fluxes.

Fluxes generate vapour when they are heated and irritate eye, throat, and nose.

Avoid inhalation, exposure of this vapour (TLV: 2.5 mg/m³) as much as possible.

Use them where the ventilator is equipped.

Avoid direct contact of fluxes with skin, eye, and ingestion.

<References>

<*1> CAS #: Chemical substance register number of Chemical Abstracts Service

<*2> ACGIH: American Conference of Governmental Industrial Hygienists

<*3> TLV-TWA: Threshold Limit-Time Weighted Average

<*4> JCGIH: Japanese Conference of Governmental Industrial Hygienists

<*5> STEL: Short Term Exposure Limit

<*6> OSHA: Occupational Safety and Health Administration

<*7> PEL: Permissible Exposure Limit

<*8> NIOSH: National Institute for Occupational Safety and Health

<*9> MSHA: The Federal mine Safety and Health Act

<*10> TDLo: Toxic Dose Lowest

<*11> RTECS: Registry of Toxic Effects of Chemical Substances

<*12> LD: Lethal Dose

<: *13> LD₅₀: 50% Lethal Dose

<*14> TCLo: Toxic Concentration Lowest

<*15> LC₅₀: 50% Lethal Concentration

<*16> EPA: Environmental Protection Agency

<*17> PRTR: Pollutant Release and Transfer Register

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