

SAFETY DATA SHEET

1. IDENTIFICATION

Chemical product name : EPINAL EN-4900GC
Name of manufacturer : Hitachi Chemical Co., Ltd. (Yamazaki Works)
Address : 4-13-1, Higashi-cho, Hitachi-shi, Ibaraki, 317-8555, Japan
Name of section : Electrical Performance Materials R&D Dept.
Advanced Performance Materials Development Center
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Emergency phone number : Hitachi Chemical International Co., (Taiwan) Ltd.
+<886> (2) 2581-3632 (Taipei) (Business hours)
Hitachi Chemical Co., Ltd. (Yamazaki Works)
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Recommended use of the chemical and restrictions on use : Material for semiconductor

2. HAZARDS IDENTIFICATION

【GHS CLASSIFICATION】

Physical hazards : Flammable liquids ; Not classified
Health Hazards : Acute toxicity (Oral) ; Classification not possible
Acute toxicity (Dermal) ; Classification not possible
Acute toxicity (Inhalation) ; Classification not possible
Skin corrosion/irritation ; Classification not possible
Serious eye damage/eye irritation ; Classification not possible
Respiratory sensitization ; Classification not possible
Skin sensitization ; Classification not possible
Germ cell mutagenicity ; Classification not possible
Carcinogenicity ; Classification not possible
Reproductive toxicity ; Classification not possible
Specific target organ toxicity (Single exposure) ; Classification not possible
Specific target organ toxicity (Repeated exposure) ; Classification not possible
Aspiration hazard ; Classification not possible
Environmental Hazards : Hazardous to the aquatic environment (Acute hazard) ; Category 3

Hazardous to the aquatic environment (Long-term hazard) ; Classification not possible
Hazardous to the ozone Layer ; Classification not possible
(Note) Approximately 25% of mixture consists of ingredients of unknown hazards to the aquatic environment.

[GHS LABEL ELEMENTS]

Symbol : None
Signal word : None
Hazard statements : •Harmful to aquatic life
Precautionary statements
[Prevention] : •Avoid release to the environment.
[Response] : None
[Storage] : None
[Disposal] : •Dispose of contents/containers in accordance with the rules of the country/province/municipality.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture : Mixture
Chemical name or common name : Silver color paste

Non-hazardous ingredients	Composition (%)	Chemical formula	CAS No.
Epoxy resin	1 - 4	-	Trade secret
Acrylic resin	6 - 11	-	Trade secret
Acrylate	3 - 8	-	Trade secret
Butadiene copolymer	<2.0	-	Trade secret
Polybutadiene derivative	2 - 9	-	Trade secret
Peroxide	<1.0	-	Trade secret
Additive	<2.0	-	Trade secret
Silver	72 - 82	Ag	7440-22-4

※*Attention: Silver (powder) is listed on the "First Stage of 1062 Substances". Peroxide is listed on the "Second Stage of 1089 Substances".

4. FIRST-AID MEASURES

Inhalation : Remove the victim from the contamination immediately to fresh air atmosphere, then cover the body with a blanket etc. to keep warm and quiet.
If the victim get into respiratory difficulties, provide oxygen inhalation or give artificial respiration after loosening clothing and having secured the respiratory tract.
Get medical advice/attention as necessary.

Skin contact : Remove all contaminated clothing and shoes immediately.
Wash away the affected area with plenty of water and soap.

- If you feel skin abnormality such as itching or pain, etc. get medical attention.
- Eye contact : Wash eyes with plenty of clean water for at least 15 minutes and refer for ophthalmologist attention.
During eyewash, open the eyelids well with fingers and move the eyes around to reach water to every corner of the eyes.
Remove contact lenses if they can be removed easily.
- Ingestion : Rinse out mouth with water, but do not make the victim to vomit forcibly.
When the victim vomits naturally, incline the body not to enter into the trachea.
If you feel abnormality, get medical attention.

5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : Carbon dioxide, foam, chemical powder, dry sand and water spray
Unsuitable extinguishing media : High pressure water jet may spread a fire.
- Specific hazards arising from the chemical : Toxic gases (carbon monoxide, etc.) may be generated upon combustion.
- Specific extinguishing methods : Use chemical powder, carbon dioxide, or dry sand for an early stage of fire.
In case of large fires, air should be cut off using foam agent in order to extinguish at once.
In case of fire in the surrounding areas, cool equipment by water spraying.
If possible, move containers to safe areas.
Be careful not to cause environmental pollution by the outflow of fire extinguishing and/or dilution water.
- Special protective equipment for firefighters : Firefighters should wear proper protective equipment such as self-breathing apparatus. Extinguish fire from windward.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Rope off the spilled area to prohibit the entrance of unauthorized personnel.
Do not recover spills at the leeward.
Wear proper protective equipment during collection work.
- Environmental precautions : Do not impregnate the spills into soil. Do not wash it away into sewers, watercourses or rivers.

Methods and material for containment and cleaning up

- : For small spills, absorb spills with paper towels or waste cloths etc, then put them into sealable containers.
For large spills, stop leakage with dike of earth or sand, and then cover over spills with foam and absorb them with dry sand or non-flammable adsorbent, then put them into sealable containers.
Use non-sparking shovels or, etc.
Remove ignition sources nearby and prevent from fire outbreaks.
The waste shall be disposed of according to "13.DISPOSAL CONSIDERATIONS".

7. HANDLING AND STORAGE

- Precautions for safe handling : Keep Fire Away. Take measures against static discharges such as grounding.
Use in the closed apparatus/equipment. Work under local exhaustion.
Avoid breathing vapours or contact with skin as much as possible.
If there is a risk of exposure, wear appropriate protective equipment.
Enforce hand-washing or cleansing with soap after work.
If you feel abnormality or abnormality has occurred in the body, take measures according to "4.FIRST-AID MEASURES", and then be sure to consult a physician.
- Storage : Store surely in sealable containers. Keep fire away at storage location.
Store locked up.
Keep away from sunlight and store in freezing below -15°C.
Keep away from incompatible materials. (Refer to section 10)

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Appropriate engineering controls : Seal the entire facility/equipment or install a local exhaust system.
Make available eye washer and safety shower near the work area.
Install flammable gas detectors, toxic gas detectors and flammable gas alarm depending on the circumstances.
- Occupational Exposure Limits
- Taiwan Permissible Concentration Standard : (TWA) 0.01mg/m³ (STEL) 0.03mg/m³ (Silver, metal dust and soluble compound and fume (as Ag))
- ACGIH-TLV ¹⁾ : (TWA) 0.1mg/m³ (dust and fume) (Silver metal powder)
(TWA) Time-Weighted Average, (STEL): Short Time occupational Exposure Limits (15 minutes)

Personal protective equipment

- Respiratory protection : Gas masks for organic gases, air-supplied respirators, self-contained breathing apparatuses (SCBA), etc.
- Hands protection : Impervious protective gloves
- Eye protection : Protective glasses with the side shield or face protection.
- Skin and body protection : Impermeable protective clothing, protective boots, aprons.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Silver color paste
- Odor : Weak acrylic odor
- Boiling point : No data available
- Flash point : >93°C
- Flammability limit or lower and upper explosion limits : No data available
- Vapour pressure : No data available
- Relative density : approx. 3.4
- Auto-ignition temperature : No data available
- Solubility in water : Insoluble
- (Reference data)²⁾
- Boiling point : 2212°C (Silver)
- Relative density : 10.5(Silver)
- Solubility in water : Insoluble (Silver)
- Melting/Freezing point : 962°C(Silver)

10. STABILITY AND REACTIVITY

- Reactivity/Chemical stability : Stable under normal handling conditions.
- Possibility of hazardous reactions : May react with incompatible materials.
- Conditions to avoid : Direct sunlight and high temperature
- Incompatible materials : Strong oxidizing agents, Strong acids, Strong bases, Radical initiators, Inert gases, Oxygen scavengers, Amines, Heavy metals, Reducing agents, Concentrated hydrogen peroxide solution, Acetylene, Ammonia.
- Hazardous decomposition products : Toxic gases (carbon monoxide, etc.) may be generated on combustion.

11. TOXICOLOGICAL INFORMATION

- Acute toxicity
- [Oral] : No ingredients data available
- [Dermal] : No ingredients data available
- [Inhalation] : No ingredients data available

Skin corrosion/irritation

Acrylic resin : Showed negative in skin irritation tests of rabbits.³⁾

Serious eye damage/eye irritation

Acrylic resin : Showed negative in eye irritation tests of rabbits.³⁾

Peroxide : Causes serious eye irritation.⁴⁾

Respiratory sensitization

Peroxide : May cause allergy or asthma symptoms or breathing difficulties if inhaled.⁴⁾

Skin sensitization

Peroxide : May cause an allergic skin reaction.⁴⁾

Germ cell mutagenicity : No ingredients data available

Carcinogenicity : None of the ingredients is found on the carcinogen lists of IARC, ACGIH, NTP, OSHA.¹⁾

Reproductive toxicity : No ingredients data available

Specific target organ toxicity (Single exposure)

: No ingredients data available

Specific target organ toxicity (Repeated exposure)

: No ingredients data available

Aspiration hazard

: No ingredients data available

12. ECOLOGICAL INFORMATION

Eco-toxicity

Silver : Harmful to aquatic life.⁴⁾

Persistency and Biodegradability : No ingredients data available

Bioaccumulation potential : No ingredients data available

Mobility in soil : No ingredients data available

Hazardous to the ozone Layer : No ingredients data available

13. DISPOSAL CONSIDERATIONS

Residual waste : Absorb the residue of product with diatomaceous earth etc. Burn it little by little, or spray and burn it in a chemical incinerator equipped with an afterburner and a scrubber in accordance with all applicable regulations.
Incinerated ash shall be disposed of according to the laws and regulations.
Entrust disposal of a large amount of wastes to a special authority or certificated processing suppliers.
Follow all relevant laws, regulations and municipality instructions.

Contaminated containers and packaging : Wash and recycle containers or perform a proper disposal of in accordance with the relevant laws, regulations and standards of municipality.
In case of disposing of empty containers, remove the contents completely.

14. TRANSPORT INFORMATION

UN Number : Not applicable
Proper shipping name : Not applicable
UN Class : Not applicable
Packing group : Not applicable
Marine pollutants : No
Special safety measures applicable to transport or conveyance :
: Make chilled transport in dry ice, etc.
Check container's damage, leakage and tightness of taps. Pile containers carefully to avoid shock, falling, dropping and damage dangerous goods dropping, falling and damage of them, and prevent containers from collapsing surely.
When loading and unloading cargoes, put the parking brake on, shut down the engine, and put car stops under tires.
Don't handle the container violently.
Avoid direct sunlight, packaging damage, water wetting.
Handle in accordance with the description of "7 HANDLING AND STORAGE."
Follow strictly transportation related laws and regulations.

15. REGULATORY INFORMATION

- Classification and labeling in accordance with Taiwan Occupational Safety and Health Act (OSHA): See section 2.
- Silver (powder) is listed on the "First Stage of 1062 Substances". Peroxide is listed on the "Second Stage of 1089 Substances".
- All the components are listed on the Inventory of Chemical Substance Nomination & Notification in Taiwan.
- Regulatory information with regard to this product in your country or in your region should be examined by your own responsibility.

16. OTHER INFORMATION

References cited

- 1) 2017 Threshold Limit Values for Chemical Substances in the Work Environment (ACGIH)
- 2) International Chemical Safety Cards (ICSC) Japanese version (National Institute of Health Sciences (NIHS))
- 3) "Safety Data Sheet" of the Acrylic resin manufacturer (2012)
- 4) Taiwan. CLA GHS Classification List (Council of Labor Affairs, GHS Documents, June 2014) [Advisory]

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The information herein is given in good faith in accordance with the data in a variety of technical publications.

It is the user's responsibility to determine the suitability of this information for the adoption of necessary safety precautions.

In addition, the information listed here is made based on the latest information by our investigation at the time of creation, but please understand that revision is possible by amendment of laws, regulations or the announcement of new toxicity test results.