

NITTO DENKO

Material Safety Data Sheet(MSDS)

Prepared on : 2006/10/13

Revised on : 2007/02/21

1. Product and company identification

Product name EPOXY MOLDING COMPOUND for Optical Semiconductor

Name of product(chemical name, brand name, etc.): NT-332H-10000

Supplier product code : 79126-10-48-4-1-E

Company identification

Name of the supplier: NITTO DENKO CORPORATION KAMEYAMA PLANT

Address : 519-0193 919, FUKE, KAMEYAMA, MIE, JAPAN

A Section in Charge : QA SECTION SEMICONDUCTOR RELATED PRODUCTS DIV.

Telephone number : 81-595-84-2840 FAX number : 81-595-83-0389

Emergency telephone number: 81-595-82-1151

2. Composition / information on ingredients

Distinction between a
substance and a
preparation : Compound

The common chemical name or the generic name	Bisphenol-A Epoxy Resin (solid)	Tetra Hydrophthalic Anhydride	Dimethylbenzylamine
Other name			
Chemical formula or structural formula			
Content (mass%)	60-80	15-35	0.1-1.0
The serial number of the notifications on the official gazette	7-1283	3-2460/3-2416	-
CAS number	25068-38-6	19438-60-9/85-42-7	-

3. Hazards identification

Most important hazards and effects
of the productAdverse human health effects : Tris(2,3-Epoxypropyl) 1,3,5-Triglycidyl Isocyanurate :
possibility of mutagenicityPowder dust or evaporation from molding process may irritate to the
eye and skin.Physical and chemical hazards : May occur extraordinary reaction and generate high temperature when
contact with strong alkalis or acids.

Specific hazards : Tris(2,3-Epoxypropyl) 1,3,5-Triglycidyl Isocyanurate

Main symptoms : Tris(2,3-Epoxypropyl) 1,3,5-Triglycidyl Isocyanurate
: possibility of mutagenicityPowder dust or evaporation from molding process may irritate to the
eye and skin.

Emergency overview :

4. First-aid measures

Inhalation : If affected, move to fresh air. Keep the victim at rest.

Inhalation :	Wipe off adhering powder and wash exposed area with lots of water and soap. Contact a physician if irritation occurs.
Eye contact :	Immediately flush with large amounts of water for at least 15 minutes. Examination and treatment by a physician if necessary.
Ingestion :	Give the water and try to get the victim to vomit. Contact a physician as soon as possible.

A brief description of the most important symptoms and effect :

Protection of first-aiders :

Special notes to a physician :

5. Fire-fighting measures

Extinguishing media :	Carbon dioxide, powder, foam, and dry sand
NOT suitable extinguishing media :	Water in a jet.
Specific hazards :	Dark smoke is generated at a fire.
Specific methods :	Extinguish fire toward the leeward after removing the cause of fire.
Protection of firefighters :	Wear full protective clothing and self-contained breathing apparatus with full face-piece.

6. Accidental release measures

Personal precautions :	Persons not wearing protective equipment should be excluded from the area of the spill until clean-up has been completed.
Environmental precautions :	Prevent spills to river, drainage etc.
Methods for Cleaning up	
Recovery :	In case of spill, wipe up with wipers or vacuum cleaners.
Neutralization :	
Disposal :	See Section 13 for information in disposal.

7. Handling and storage

Handling	
Safe handling advice:	Wear mask with the activated carbon, the protective glove, and the protection clothes
Precautions :	Apply whole ventilation over processing areas and local ventilation on molding machine.
Safe handling advice :	Avoid contact with strong acids or alkalis.
Storage	
Technical measures :	Keep containers closed.
Incompatible products :	Strong acids or alkalis.
Storage conditions	
Suitable storage conditions :	Keep under 5 degreeC in closed containers and away from direct sunlight, heat .
Storage conditions to be avoided :	Avoid keeping in higher temperature.
Packaging materials :	Closed or covered containers which have shock-absorbing function.
Recommended :	Keep under 5 degreeC in closed containers and away from direct sunlight, heat .

8. Exposure controls / personal protection

Engineering measures :	Apply whole ventilation over processing areas and local ventilation on necessary place.
Control parameters :	NA

Personal protective equipment	
Respiratory protection :	Wear mask with the activated carbon.
Hand protection :	Wear impervious protective gloves.
Eye protection :	Dust-tight goggles.
Skin and body protection :	Clothes of the long sleeve are recommended.

9. Physical and chemical properties

Physical state

Form :	Tablet or Powder
Color :	White
Odour :	Smell of epoxy and acid
pH :	NA
Specific temperature / temperature ranges at which changes in physical state occur	
Fusing point :	50-65 degreeC (Softening temperature)
Decomposition temperature :	above 200 degreeC
Flash point :	No data
Autoignition temperature :	above 200 degreeC
Explosion properties :	No data
Density :	1.24(Cured sample at 25 degreeC)
Solubility, with indication of the solvent :	Not miscible in water, miscible in Ketone.

10. Stability and reactivity

Stability :	Stable below 5 degreeC, Shelf life : according to our specification.
Possible hazardous reactions occurring under specific conditions :	May occur extraordinary reaction when contacted with strong acids, alkalis or oxidant and generate toxicity gas.
Conditions to avoid :	Store in high temperature or humidity.
Materials to avoid :	Strong acids, oxidizing agents or oxidant.
Hazardous decomposition products :	Thermal decomposition may form carbon monoxide, carbon dioxide, nitrogen, nitrogen oxide and water vapor.

11. Toxicological information

Acute toxicity :	Oral LD50(Rat)
	Bisphenol-A Epoxy Resin (solid) : 2000mg/Kg <
	Tris(2,3-Epoxypropyl) 1,3,5- Triglycidyl Isocyanurate : 715mg/Kg <
	Tetra Hydrophthalic Anhydride : 4590mg/Kg <
Local toxicity :	NA
Sensitization :	Bisphenol-A Epoxy Resin (solid) : no
	Tris(2,3-Epoxypropyl) 1,3,5- triglycidylIsocyanurate :
	- GUINEA PIG =MODERATE -- STRONG SENSITISER
	- May causes an allergy and slight irritation with itching and local redness.

Specific effects

Carcinogenicity :

Tris(2,3-Epoxypropyl) 1,3,5- Triglycidyl Isocyanurate
- negative (oral 98 week, male rat)

Reproduction toxicity :

Tris(2,3-Epoxypropyl) 1,3,5- Triglycidyl Isocyanurate
(Oral 13 week, male rat)
No treatment-related Repro-toxicity at 10, 30, 100ppm
(0.72, 2.08, 7.32mg/Kg/day)

Mutagenicity :

Tris(2,3-Epoxypropyl) 1,3,5- Triglycidyl Isocyanurate :

IN VITRO :

AMES TEST Salmonella typhimurium - Positive

Escherichia coli - Negative

CELL TRANSFORMATION - Negative

HUMAN LYMPHOCYTES - Negative

MOUSE LYMPHOCYTES - Positive

DNA REPAIR(HUMAN FIBROBLASTS) - Negative

IN VIVO :

ORAL

SISTER CHROMALY - Marginally Positive

NUCLEUS ANOMALY(Chinese hamster) - Positive

DL(Dominant lethal, mouse) - Negative

SPC(Spermatogonial cytogenetics, mouse) - Positive

SPERMATOCYTES(mouse) - Negative

INHALATION

(1) Whole body 5 days exposure of mouse(Bushy Run
Reserch Center)

DL(Dominant lethal, mouse) - Negative up to
maximum dose

SPC(Spermatogonial cytogenetics, mouse) - Positive at

10mg/m³

No effect at

2.5mg/m³

(2) Nose only 5 days exposure of mouse(SafePharm Lab.)

SRC(Spermatogonial cytogenetics, mouse)

- No effect at 8mg/m³

Other :

[Eye Effects]

Bisphenol-A Epoxy Resin (solid) : Slightly Irritating

Tris(2,3-Epoxypropyl) 1,3,5- triglycidylIsocyanurate
: positive (rat)

Tetra Hydrophthalic Anhydride : Positive Irritating

[Skin Effects]

Bisphenol-A Epoxy Resin (solid) : no

Tris(2,3-Epoxypropyl) 1,3,5- triglycidylIsocyanurate
: MILD IRRITANT

Tetra Hydrophthalic Anhydride : MILD

[Mutagenic Effects]

Bisphenol-A Epoxy Resin (solid) : no

Tris(2,3-Epoxypropyl) 1,3,5- triglycidylIsocyanurate
- AMES Test

Salmonella Typhimurium -- Positive

Escherichia coli --Negative

- Cell Transformation -- Negative

- Human Lymphocytes -- Negative

- Mouse Lymphoma--Positive

-DNA Repair &#8211; Negative

12. Ecological information

Information on fate

Persistence / degradability : Tris(2,3-Epoxypropyl) 1,3,5- triglycidylisocyanurate :

Biodegradability is low.

Tetra Hydrophthalic Anhydride :

Biodegradability is low.

13. Disposal considerations

Product : Dispose in accordance with all applicable local , state, and federal regulations.

Waste from residues : Dispose to licensed disposal processor.

Contaminated packaging : Remove all packaging for recovery or waste disposal. Dispose as industrial waste.

14. Transport information

Informations for Code and classification at international regulations

Land : Assure containers are not damaged to prevent leakage of product before loading.

Keep under 5 degreeC in closed containers and away from direct sunlight, heat .

Sea : Assure containers are not damaged to prevent leakage of product before loading.

Keep under 5 degreeC in closed containers and away from direct sunlight, heat .

Air : Assure containers are not damaged to prevent leakage of product before loading.

Keep under 5 degreeC in closed containers and away from direct sunlight, heat .

The UN classification number : NA

15. Regulatory information

Regulations : It is necessary to follow all regulations in your country.

16. Other information

Disclaimer:

This information is made based on data from such as raw material MSDS, and our current knowledge.

The information contained herein is believed to be accurate, and is intended to describe the product for the purposes of health,

safety and environmental requirements only.

Therefore it should not be construed as guaranteeing any specific property of the product.
Recipient shall assume all responsibility for the use of this information and the use (alone or in combination with any other product),
storage or disposal of the product, including any resultant personal injury or property damage.