

HD 8940

Version 2.6

Revision Date 10/04/2016

Ref. 130000125480

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : HD 8940
Product Use : Electrical/electronic industries
PBO Precursor Coating for Electronics Industry

Restrictions on use : For Industrial and Professional Use Only

Manufacturer/Supplier : Hitachi Chemical DuPont Microsystems Ltd.
4-13-1 Higashi-cho, Hitachi-shi Ibaraki, 317-8555
Japan

Product Information : 03-3868-8124
Medical Emergency : 1-800-441-3637 (outside the U.S. 1-302-774-1139)
Transport Emergency : CHEMTREC: +1-800-424-9300 (outside the U.S. +1-703-527-3887)

Importer/Distributor : HD Microsystems™
250 Cheesequake Road, Parlin, New Jersey 08859

Telephone : 800-346-5656

SECTION 2. HAZARDS IDENTIFICATION**Product hazard category**

Flammable liquids	Category 4
Acute toxicity (Oral)	Category 4
Serious eye damage/eye irritation	Category 1
Reproductive toxicity	Category 1B
Specific target organ toxicity - single exposure	Category 3

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Label content

Pictogram

:



Signal word

: Danger

Hazardous warnings

: Combustible liquid.
Harmful if swallowed.
Causes serious eye damage.
May cause respiratory irritation.
May cause drowsiness or dizziness.
May damage fertility or the unborn child.

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Hazardous prevention measures

: Obtain special instructions before use.
 Do not handle until all safety precautions have been read and understood.
 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
 Wash skin thoroughly after handling.
 Do not eat, drink or smoke when using this product.
 Use only outdoors or in a well-ventilated area.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
 IF exposed or concerned: Get medical advice/attention.
 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
 Store in a well-ventilated place. Keep container tightly closed.
 Store in a well-ventilated place. Keep cool.
 Store locked up.
 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 40 - 50 %

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
γ-Butyrolactone	96-48-0	45 - 55 %
Tetrahydro-1,3,4,6-tetrakis(methoxymethyl)imidazo[4,5-d]imidazole-2,5(1H,3H)-dione	17464-88-9	1 - 10 %

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Methanol	67-56-1	0.1 - 1 %
N-Methyl-2-pyrrolidone	872-50-4	0.1 - 1 %

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4. FIRST AID MEASURES

- General advice : No applicable data available.
- Inhalation : If inhaled, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
- Skin contact : Wash off with soap and water. Get medical attention if irritation develops and persists. Wash contaminated clothing before re-use.
- Eye contact : If in contact with eyes: Remove contact lenses, if present and easy to do. Continue rinsing.
- Ingestion : If swallowed Rinse mouth with water. Call a physician or poison control centre immediately. DO NOT induce vomiting unless directed to do so by a physician or poison control center.
- Most important symptoms/effects, acute and delayed : No applicable data available.
- Protection of first-aiders : No applicable data available.
- Notes to physician : No applicable data available.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Dry sand, Dry chemical, Alcohol-resistant foam, Carbon dioxide (CO₂)
- Unsuitable extinguishing media : No applicable data available.

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- Specific hazards : Hazardous decomposition products formed under fire conditions. (see also section 10) Avoid breathing decomposition products.
- Special protective equipment for firefighters : Wear self-contained breathing apparatus and protective suit.
- Further information : Evacuate personnel to safe areas. Stop spill/release if it can be done with minimal risk. Do not allow run-off from fire fighting to enter drains or water courses.

SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

- Safeguards (Personnel) : Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Wear suitable protective equipment.
- Environmental precautions : Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Clean contaminated floors and objects thoroughly while observing environmental regulations.
- Spill Cleanup : Contain spill. Soak up with inert absorbent material. Collect and contain contaminated absorbent and dike material for disposal. Keep in suitable, closed containers for disposal. Ventilate the area. Clean contaminated surface thoroughly.
- Accidental Release Measures : Dispose of in accordance with local regulations.

SECTION 7. HANDLING AND STORAGE

- Handling (Personnel) : Avoid contact with skin, eyes and clothing. Use sufficient ventilation to keep employee exposure below recommended limits. Wash thoroughly after handling. To avoid spills during handling keep bottle on a metal tray. Handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes and clothing. Contaminated work clothing should not be allowed out of the workplace. Remove contaminated clothing and protective equipment before entering eating areas. Remove and wash contaminated clothing before re-use.

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Handling (Physical Aspects)	: Keep away from heat and sources of ignition.
Dust explosion class	: No applicable data available.
Storage	: Keep frozen. Keep away from direct sunlight. Keep in a cool, well-ventilated place.
Storage period	: No applicable data available.
Storage temperature	: -21 - -15 °C (-6 - 5 °F)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls	: Use sufficient ventilation to keep employee exposure below recommended limits.
Personal protective equipment	
Respiratory protection	: Provide adequate ventilation. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Consult the respirator manufacturer to determine the appropriate type of equipment for a given application. Observe respirator use limitations specified by the manufacturer. Respirator with filter for organic vapour Have available emergency self-contained breathing apparatus or full-face airline respirator when using this chemical.
Hand protection	: Material: butyl-rubber Additional protection: Gloves must be inspected prior to use.
Hand protection	: Material: Natural Rubber Additional protection: Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Hand protection	: Additional protection: The choice of an appropriate glove does not only depend on its material but also on other quality features and is different from one producer to the other.
Hand protection	: Additional protection: The exact break through time can be obtained from the protective glove producer and this has to be observed.
Hand protection	: Additional protection: Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion, and the contact time.

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- Eye protection : Wear safety glasses or coverall chemical splash goggles.
- Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Lightweight protective clothing
Safety shoes
- Protective measures : All chemical protective clothing should be visually inspected prior to use. Clothing and gloves should be replaced in case of chemical or physical damage or if contaminated.

Exposure Guidelines
Exposure Limit Values

γ -Butyrolactone
No applicable data available.

Tetrahydro-1,3,4,6-tetrakis(methoxymethyl)imidazo[4,5-d]imidazole-2,5(1H,3H)-dione
No applicable data available.

Methanol				
Permissible exposure limit:	(OSHA)	200 ppm	260 mg/m ³	8 hr. TWA
TLV	(ACGIH)	200 ppm	TWA	
TLV	(ACGIH)	250 ppm	STEL	
AEL *	(DuPont)	200 ppm	8 & 12 hr. TWA, Skin	
N-Methyl-2-pyrrolidone				
AEL *	(DuPont)	5 ppm	8 & 12 hr. TWA, Skin	

Biological Exposure Indices

Methanol

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BEI	(ACGIH)	15 mg/l Methanol/Urine Sampling time: End of shift.
N-Methyl-2-pyrrolidone BEI	(ACGIH)	100 mg/l 5-Hydroxy-N-methyl-2-pyrrolidone/Urine Sampling time: End of shift.

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	: liquid
Form	: viscous liquid
Color	: red

Odor : ester-like

Odor threshold : No applicable data available.

pH : no data available

Melting point/range : No applicable data available.

Boiling point/boiling range : Boiling point/boiling range
no data availableFlash point : 64.3 °C
Method: Setaflash closed cup - SCC

Evaporation rate : No applicable data available.

Flammability (solid, gas) : No applicable data available.

Upper explosion limit : No applicable data available.

Lower explosion limit : No applicable data available.

Vapour Pressure : No applicable data available.

Vapour density : No applicable data available.

Density : 1.2 g/cm³

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Specific gravity (Relative density)	: No applicable data available.
Water solubility	: insoluble
Solubility(ies)	: No applicable data available.
Partition coefficient: n-octanol/water	: No applicable data available.
Auto-ignition temperature	: No applicable data available.
Decomposition temperature	: No applicable data available.
Viscosity, kinematic	: No applicable data available.
Viscosity, dynamic	: 1,800 mPa.s

SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: Decomposes on heating. The product is chemically stable under recommended conditions of storage, use and temperature.
Possibility of hazardous reactions	: Heating can release hazardous gases. Decomposes on heating.
Conditions to avoid	: Heat, flames and sparks. Extremes of temperature and direct sunlight.
Incompatible materials	: Peroxides alkaline substances Powdered metal salts Strong acids and strong bases oxidizers
Hazardous decomposition products	: Hazardous thermal decomposition products may include: Carbon dioxide (CO ₂), Carbon monoxide, Hydrocarbons, Nitrogen oxides (NO _x)

SECTION 11. TOXICOLOGICAL INFORMATION

γ-Butyrolactone

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Inhalation	:	An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.
Dermal LD50	:	5,640 mg/kg , Guinea pig
Oral LD50	:	1,582 mg/kg , Rat Central nervous system effects
Skin irritation	:	No skin irritation, Rabbit
Eye irritation	:	Irreversible effects on the eye, Rabbit
Skin sensitization	:	Does not cause skin sensitisation., Mouse
Repeated dose toxicity	:	Oral Rat - 90 d NOAEL: 225 mg/kg No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification., Reduced body weight gain
Carcinogenicity	:	Not classifiable as a human carcinogen. Animal testing did not show any carcinogenic effects.
Mutagenicity	:	Animal testing did not show any mutagenic effects. Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others. Did not cause genetic damage in cultured bacterial cells.
Teratogenicity	:	Animal testing showed no developmental toxicity.

Tetrahydro-1,3,4,6-tetrakis(methoxymethyl)imidazo[4,5-d]imidazole-2,5(1H,3H)-dione

Inhalation 4 h LC50	:	> 0.291 mg/l , Rat
Dermal LD50	:	> 10,000 mg/kg , Rabbit
Oral LD50	:	> 2,000 mg/kg , Rat
Skin irritation	:	No skin irritation, Rabbit
Eye irritation	:	Moderate eye irritation, Rabbit
Skin sensitization	:	Animal test did not cause sensitization by skin contact., Guinea pig

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Mutagenicity : Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Evidence suggests this substance does not cause genetic damage in animals.

Methanol

Inhalation Acute toxicity estimate : 3 mg/l , animals (unspecified species)
Target Organs: Central nervous system, Eye
Central nervous system effects
narcosis
eye effects

Dermal Acute toxicity estimate : 300 mg/kg , animals (unspecified species)
Target Organs: Central nervous system, Eye
Central nervous system effects
narcosis
eye effects

Oral Acute toxicity estimate : 100 mg/kg , animals (unspecified species)
Target Organs: Central nervous system, Eye
Central nervous system effects
narcosis
eye effects

Skin irritation : No skin irritation, Rabbit

Eye irritation : No eye irritation, Rabbit
Slight irritation observed but insufficient to warrant classification

Skin sensitization : Does not cause skin sensitisation., Guinea pig

Carcinogenicity : Not classifiable as a human carcinogen.
Overall weight of evidence indicates that the substance is not carcinogenic.

Mutagenicity : Weight of evidence does not support classification as a germ cell mutagen.
Animal testing did not show any mutagenic effects.
Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others.
Genetic damage in cultured bacterial cells was observed in some laboratory tests but not in others.

Reproductive toxicity : No toxicity to reproduction

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Evidence suggests the substance is not a reproductive toxin in animals.

Teratogenicity : Evidence suggests the substance is not a developmental toxin in animals.

N-Methyl-2-pyrrolidone
Inhalation 4 h LC50

: > 5.1 mg/l , Rat
Target Organs: Respiratory Tract
Respiratory tract irritation

Dermal LD50 : > 5,000 mg/kg , Rat

Oral LD50 : 4,150 mg/kg , Rat

Skin irritation : No skin irritation, Rabbit
Minimal effects that do not meet the threshold for classification.

Eye irritation : Irritation to eyes, reversing after 7 to 21 days, Rabbit

Skin sensitization : Does not cause skin sensitisation., Mouse

Repeated dose toxicity : Oral
Rat
- Method: OECD Test Guideline 408
No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification., Reduced body weight gain

Inhalation
Rat

-
No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification., Respiratory irritation

Dermal
Rabbit

- Method: OECD Test Guideline 410
No toxicologically significant effects were found.

Carcinogenicity : Not classifiable as a human carcinogen.
Overall weight of evidence indicates that the substance is not carcinogenic.

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- Mutagenicity** : Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Animal testing did not show any mutagenic effects.
- Reproductive toxicity** : Presumed human reproductive toxicant
Animal testing showed effects on reproduction at levels equal to or above those causing parental toxicity.
Reduced fertility
- Teratogenicity** : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.
Reduced embryo-foetal viability
Foetal malformations

Carcinogenicity

The carcinogenicity classifications for this product and/or its ingredients have been determined according to HazCom 2012, Appendix A.6. The classifications may differ from those listed in the National Toxicology Program (NTP) Report on Carcinogens (latest edition) or those found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest edition).

Material	IARC	NTP	OSHA
4-Methylpentan-2-one	2B		

SECTION 12. ECOLOGICAL INFORMATION**Aquatic Toxicity****γ-Butyrolactone**

- 96 h LC50 : *Leuciscus idus* (Golden orfe) 316 mg/l DIN 38412
- 72 h EC50 : *Desmodesmus subspicatus* (green algae) > 1,000 mg/l
- 48 h EC50 : *Daphnia magna* (Water flea) > 500 mg/l Directive 67/548/EEC, Annex V, C.2.

Tetrahydro-1,3,4,6-tetrakis(methoxymethyl)imidazo[4,5-d]imidazole-2,5(1H,3H)-dione

- 96 h LC50 : *Lepomis macrochirus* (Bluegill sunfish) > 1,000 mg/l

Methanol

- 96 h LC50 : *Lepomis macrochirus* (Bluegill sunfish) 15,400 mg/l

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96 h LC50 : Selenastrum capricornutum (green algae) 22,000 mg/l

48 h EC50 : Daphnia (water flea) > 10,000 mg/l

N-Methyl-2-pyrrolidone

96 h LC50 : Oncorhynchus mykiss (rainbow trout) > 500 mg/l

72 h ErC50 : Desmodesmus subspicatus (green algae) 600.5 mg/l

72 h NOEC : Desmodesmus subspicatus (green algae) 125 mg/l

21 d : NOEC Daphnia magna (Water flea) 12.5 mg/l OECD Test Guideline 211

Environmental Fate

γ-Butyrolactone

Bioaccumulation : Bioaccumulation is unlikely.

Methanol

Bioaccumulation : Bioaccumulation is unlikely.

N-Methyl-2-pyrrolidone

Biodegradability : Biodegradable 73 % OECD Test Guideline 301C

Bioaccumulation : Accumulation in aquatic organisms is unlikely.

Additional ecological information : No data is available on the product itself.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste disposal methods - Product : Dispose of in accordance with local regulations. Must be incinerated in a suitable incineration plant holding a permit delivered by the competent authorities. Never place unused product down any indoor or out door drain.

Waste disposal methods - Container : Do not reuse empty container. Contaminated/not cleaned containers should be treated/handled like product waste. Dispose of container properly. Refer to applicable Local, State/Provincial, and Federal Regulations, as well as industry Standards.

Contaminated packaging : No applicable data available.

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SECTION 14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

TSCA	: On the inventory, or in compliance with the inventory
SARA 313 Regulated Chemical(s)	: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
NJ Right to Know Regulated Chemical(s)	: Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Ethanol, Methanol, N-Methyl-2-pyrrolidone
California Prop. 65	: WARNING! This product contains a chemical or chemicals known to the State of California to cause cancer. Formaldehyde, 4-Methylpentan-2-one WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. 4-Methylpentan-2-one, Methanol, N-Methyl-2-pyrrolidone, 2-Ethoxyethanol

SECTION 16. OTHER INFORMATION

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The information provided in this 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

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other materials or in any process, unless specified in the text.

Significant change from previous version is denoted with a double bar.