

HD 7110

Version 2.1

Issue Date : 02/06/2018 Ref. 130000149060
Revision Date : 01/24/2018

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 7110
Product Use : Electrical/electronic industries
Polyimide 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 : +1-800-424-9300 (outside the U.S. +1-703-527-3887)

Importer/Distributor : Hitachi Chemical DuPont MicroSystems LLC.
250 Cheesequake Road, Parlin, New Jersey 08859

Telephone : 800-346-5656

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

Flammable liquids	Category 4
Skin irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Skin sensitisation	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.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause respiratory irritation.
May damage the unborn child. Suspected of damaging fertility.

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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.
 Use only outdoors or in a well-ventilated area.
 Contaminated work clothing should not be allowed out of the workplace.
 Wear protective gloves/ protective clothing/ eye protection/ face protection.
 IF ON SKIN: Wash with plenty of soap and water.
 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.
 IF exposed or concerned: Get medical advice/ attention.
 If skin irritation or rash occurs: Get medical advice/ attention.
 If eye irritation persists: Get medical advice/ attention.
 Take off contaminated clothing and wash before reuse.
 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
N-Methyl-2-pyrrolidone	872-50-4	50 - 60 %
bis(alpha,alpha-Dimethylbenzyl) peroxide	80-43-3	0.5 - 1 %
2-Hydroxyethyl methacrylate	868-77-9	0.1 - 0.3 %

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

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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 : Immediately flush eyes for at least 15 minutes. Get medical attention.
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.
Water spray, Carbon dioxide (CO₂), Dry chemical, Foam
Unsuitable extinguishing media : No applicable data available.
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.

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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.
- 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. Store in a manner that material is not exposed to ultra violet light. Keep in a cool, well-ventilated place.
- Storage period : No applicable data available.

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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.
- 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

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Exposure Guidelines
Exposure Limit Values

N-Methyl-2-pyrrolidone			
AEL *	(DuPont)	5 ppm	8 & 12 hr. TWA, Skin

bis(alpha,alpha-Dimethylbenzyl) peroxide			
No applicable data available.			

2-Hydroxyethyl methacrylate			
AEL *	(DuPont)	25 ppm	15 minute TWA

Biological Exposure Indices

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 : semi-viscous liquid
 Color : red

Odor : ester-like

Odor threshold : No applicable data available.

pH : No applicable data available.

Melting point/range : No applicable data available.

Boiling point/boiling range : No applicable data available.

Flash point : 90 °C
 Method: Cleveland open cup - COC

Evaporation rate : No applicable data available.

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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 : 1.15 g/cm³ at 23 °C (73 °F)
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 : 2,300 mPa.s at 25 °C (77 °F)

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

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Powdered metal salts
Strong acids and strong bases
oxidizers

Hazardous decomposition products : Hazardous thermal decomposition products may include:
Carbon dioxide (CO₂), Carbon monoxide, Hydrocarbons, Nitrogen oxides (NO_x)

SECTION 11. TOXICOLOGICAL INFORMATION

N-Methyl-2-pyrrolidone

- Inhalation 4 h LC50 : > 5.1 mg/l , Rat
Target Organs: Respiratory system
- Dermal LD50 : > 5,000 mg/kg , Rat
- Oral LD50 : 4,150 mg/kg , Rat
- Skin irritation : Severe skin irritation, human
- Eye irritation : Irritation to eyes, reversing after 7 to 21 days, Rabbit
- Skin sensitization : Does not cause skin sensitisation., Mouse
Information given is based on data obtained from similar substances.
- Repeated dose toxicity : Ingestion
Rat
- 90 d
NOAEL: 169 mg/kg
LOAEL: 433 mg/kg Method: OECD Test Guideline 408
No toxicologically significant effects were found.
- Inhalation
Rat
- 90 d
dust/mist
NOAEL: 0.5 mg/l
LOAEL: 1 mg/l Method: OECD Test Guideline 413
No toxicologically significant effects were found.
- Skin contact
Rabbit
- 20 d
NOAEL: 826 mg/kg Method: OECD Test Guideline 410

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No toxicologically significant effects were found.

- Carcinogenicity** : Animal testing did not show any carcinogenic effects.
- Mutagenicity** : Animal testing did not show any mutagenic effects.
 Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
- Reproductive toxicity** : Animal testing showed no reproductive toxicity.
 Clear evidence of adverse effects on development, based on animal experiments.
- Teratogenicity** : Animal testing showed effects on embryo-foetal development including:
 Reduced embryo-foetal viability
 Reduced growth
 Foetal malformations
 Delayed foetal development (variations)
- bis(alpha,alpha-Dimethylbenzyl) peroxide**
- Dermal LD50** : > 2,000 mg/kg , Rat
- Oral LD50** : > 2,000 mg/kg , Rat
- Skin irritation** : Slight or no skin irritation, Rabbit
 Minimal effects that do not meet the threshold for classification.
- Eye irritation** : Slight or no eye irritation, Rabbit
 Minimal effects that do not meet the threshold for classification.
- Skin sensitization** : Does not cause skin sensitisation., Mouse
- Repeated dose toxicity** : Ingestion
 Rat
 - 90 d
 LOAEL: 320 mg/kg
 Method: OECD Test Guideline 408
 No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification., altered blood chemistry, Liver effects
- Mutagenicity** : Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
- Reproductive toxicity** : Some evidence of adverse effects on sexual function and fertility, based on animal experiments.
 Animal testing showed effects on reproduction at levels below those

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causing parental toxicity that included:
Reduced fertility
Reduced offspring survival
Information given is based on data obtained from similar substances.

Teratogenicity : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

2-Hydroxyethyl methacrylate

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

Oral LD50 : 5,564 mg/kg , Rat

Skin irritation : No skin irritation, Rabbit

Eye irritation : Eye irritation, Rabbit

Skin sensitization : May cause sensitisation by skin contact., human

Repeated dose toxicity : Oral
Rat
- Method: see user defined free text
No toxicologically significant effects were found.

Carcinogenicity : Not classifiable as a human carcinogen.
Animal testing did not show any carcinogenic effects.
Information given is based on data obtained from similar substances.

Mutagenicity : Animal testing did not show any mutagenic effects.
Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Reproductive toxicity : No toxicity to reproduction
Animal testing showed no reproductive toxicity.

Teratogenicity : Animal testing showed no developmental toxicity.
Information given is based on data obtained from similar substances.

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).

None of the components present in this material at concentrations equal to or greater than 0.1% are listed

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by IARC, NTP, or OSHA, as a carcinogen.

SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity

N-Methyl-2-pyrrolidone

- 96 h LC50 : Oncorhynchus mykiss (rainbow trout) > 500 mg/l
 72 h EC50 : Desmodesmus subspicatus (green algae) 600.5 mg/l DIN 38412
 72 h NOEC : Desmodesmus subspicatus (green algae) 125 mg/l DIN 38412
 48 h EC50 : Daphnia magna (Water flea) 4,897 mg/l
 21 d : NOEC Daphnia magna (Water flea) 12.5 mg/l OECD Test Guideline 211

bis(alpha,alpha-Dimethylbenzyl) peroxide

- 96 h LC50 : Oryzias latipes (Orange-red killifish) OECD Test Guideline 203
 Aquatic toxicity is unlikely due to low solubility.
 72 h EC50 : Pseudokirchneriella subcapitata (green algae) OECD Test Guideline 201
 Aquatic toxicity is unlikely due to low solubility.
 72 h NOEC : Pseudokirchneriella subcapitata (green algae)
 Aquatic toxicity is unlikely due to low solubility.
 48 h EC50 : Daphnia magna (Water flea) OECD Test Guideline 202
 Aquatic toxicity is unlikely due to low solubility.
 21 d : NOEC Daphnia magna (Water flea) 0.117 mg/l OECD Test Guideline 211

2-Hydroxyethyl methacrylate

- 96 h LC50 : Fish (unspecified species) > 100 mg/l OECD Test Guideline 203
 Information given is based on data obtained from similar substances.
 72 h ErC50 : Pseudokirchneriella subcapitata (green algae) 836 mg/l OECD Test Guideline 201
 72 h NOEC : Pseudokirchneriella subcapitata (green algae) 400 mg/l
 48 h EC50 : Daphnia magna (Water flea) 380 mg/l OECD Test Guideline 202

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21 d : NOEC Daphnia magna (Water flea) 24.1 mg/l

Environmental Fate

N-Methyl-2-pyrrolidone

Bioaccumulation : Bioaccumulation is unlikely.

bis(alpha,alpha-Dimethylbenzyl) peroxide

Bioaccumulation : OECD Test Guideline 305C
 The substance has the potential to bioaccumulate.

2-Hydroxyethyl methacrylate

Biodegradability : Biodegradable OECD Test Guideline 301
 Readily biodegradable.

Bioaccumulation : Bioaccumulation is unlikely.

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.

SECTION 14. TRANSPORT INFORMATION

Not regulated by DOT in non-bulk package.

Regulated by DOT/49CFR as Combustible Liquid when transported in a bulk package (>=119 gallons(450 litres)).

Not a dangerous good in the meaning of IMDG-Code, ICAO/IATA-DGR.

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SECTION 15. REGULATORY INFORMATION

SARA 313 Regulated Chemical(s) : N-Methyl-2-pyrrolidone

PA Right to Know Regulated Chemical(s) : Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): N-Methyl-2-pyrrolidone

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): N-Methyl-2-pyrrolidone, Methanol

California Prop. 65 : WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. N-Methyl-2-pyrrolidone, Methanol, Toluene

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

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