

HD8961

Version 8.0

Issue Date : 07/25/2024 Ref. 130000146479
Revision Date : 02/13/2023

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 : HD8961
Product Use : Electrical/electronic industries
PBO Precursor Coating for Electronics Industry

Restrictions on use : For Industrial and Professional Use Only

Manufacturer/Supplier : HD Microsystems, Ltd.
4-1-6 Shinjuku, Shinjuku-ku, Tokyo 160-0022
Japan

Product Information : +81-3-3868-8121, +81-3-3868-8121
Medical Emergency : +1 (888) 439-2988 (Toll free), +1 (303)-739-1125 (Caller Paid), +1 (888) 439-2988 (Toll free), +1 (303)-739-1125 (Caller Paid)
Transport Emergency : +1-800-424-9300 (outside the U.S. & Canada +1-703-527-3887), +1-800-424-9300 (outside the U.S. & Canada +1-703-527-3887)

Importer/Distributor : HD Microsystems L.L.C.
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
Carcinogenicity (Inhalation)	Category 2
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 drowsiness or dizziness.
Suspected of causing cancer if inhaled.

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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 mist or vapours.
 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	50 - 60 %
Polyamide		25 - 35 %
4-Methylpentan-2-one	108-10-1	<1 %
Methanol	67-56-1	<0.5 %
Ethanol	64-17-5	<0.5 %
Non regulated ingredients		10 - 20 %

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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 : 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.
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.

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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. Keep in a cool, well-ventilated place.
- Storage period : No applicable data available.
- Storage temperature : $\leq -15\text{ }^{\circ}\text{C}$ ($\leq 5\text{ }^{\circ}\text{F}$)

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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

Exposure Guidelines
 Exposure Limit Values

γ-Butyrolactone
No applicable data available.

Polyamide

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No applicable data available.

4-Methylpentan-2-one			
TLV	(ACGIH)	20 ppm	TWA
TLV	(ACGIH)	75 ppm	STEL
REL	(NIOSH)	75 ppm 300 mg/m3	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
REL	(NIOSH)	50 ppm 205 mg/m3	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
PEL (Permissible Exposure Limit)	(OSHA)	100 ppm 410 mg/m3	8 hr. TWA
PEL (Permissible Exposure Limit)	(OSHA)	50 ppm 205 mg/m3	TWA
PEL (Permissible Exposure Limit)	(OSHA)	75 ppm 300 mg/m3	STEL

Methanol			
TLV	(ACGIH)	200 ppm	TWA Danger of cutaneous absorption
TLV	(ACGIH)	250 ppm	STEL Danger of cutaneous absorption
REL	(NIOSH)	200 ppm 260 mg/m3	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
REL	(NIOSH)	250 ppm 325 mg/m3	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
PEL (Permissible Exposure Limit)	(OSHA)	200 ppm 260 mg/m3	8 hr. TWA
PEL (Permissible Exposure Limit)	(OSHA)	250 ppm 325 mg/m3	STEL Skin notation
PEL (Permissible Exposure Limit)	(OSHA)	200 ppm 260 mg/m3	TWA Skin notation
AEL *	(DuPont)	200 ppm	12 hr. TWA, Skin

Ethanol			
TLV	(ACGIH)	1,000 ppm	STEL
REL	(NIOSH)	1,000 ppm 1,900 mg/m3	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
PEL (Permissible Exposure Limit)	(OSHA)	1,000 ppm 1,900 mg/m3	8 hr. TWA
PEL (Permissible Exposure Limit)	(OSHA)	1,000 ppm 1,900 mg/m3	TWA

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AEL *	(DuPont)	1,000 ppm	8 & 12 hr. TWA
AEL *	(DuPont)	2,000 ppm	Short term exposure limit

Non regulated ingredients

No applicable data available.

Biological Exposure Indices

4-Methylpentan-2-one			
BEI	(ACGIH)	1 mg/l	methyl isobutyl ketone/Urine End of shift (As soon as possible after exposure ceases)

Methanol			
BEI	(ACGIH)	15 mg/l	Methanol/Urine End of shift (As soon as possible after exposure ceases)

* 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 : liquid
 Color : green

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 : 71 °C
 Method: Setafash closed cup - SCC

Evaporation rate : No applicable data available.

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

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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 : 1.19 g/cm³
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 : 790.8 mm²/s at 40 °C (104 °F)
Viscosity, dynamic : 2,000 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
Powdered metal salts
Strong acids and strong bases
oxidizers
Hazardous decomposition : Hazardous thermal decomposition products may include:

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products Carbon dioxide (CO₂), Carbon monoxide, Hydrocarbons, Nitrogen oxides (NO_x)

SECTION 11. TOXICOLOGICAL INFORMATION**γ-Butyrolactone**

- 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
Target Organs: Central nervous system
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 : Ingestion
Rat
- 90 d
NOAEL: 225 mg/kg
No toxicologically significant effects were found.
- Carcinogenicity : Not classifiable as a human carcinogen.
Animal testing did not show any carcinogenic effects.
- Mutagenicity : Animal testing did not show any mutagenic effects.
Did not cause genetic damage in cultured bacterial cells.
Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others.
- Reproductive toxicity : No toxicity to reproduction
Animal testing showed no reproductive toxicity.
- Teratogenicity : Animal testing showed no developmental toxicity.

4-Methylpentan-2-one

- Inhalation 4 h LC₅₀ : 11.6 mg/l , Rat
- Dermal LD₅₀ : > 2,000 mg/kg , Rat

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Oral LD50	:	2,080 mg/kg , Rat
Skin irritation	:	Repeated exposure may cause skin dryness or cracking., Rabbit
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., Guinea pig
Repeated dose toxicity	:	Ingestion Rat - 90 d NOAEL: 250 mg/kg LOAEL: 1,000 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. Inhalation Rat - 28 d vapour NOAEL: 450 ppm, No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification.
Carcinogenicity	:	Limited evidence of carcinogenicity in inhalation studies with animals. An increased incidence of tumours was observed in laboratory animals.
Mutagenicity	:	In vitro tests did not show 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 effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.
Methanol		
Inhalation 4 h Acute toxicity estimate	:	3 mg/l Central nervous system effects narcosis eye effects
Dermal Acute toxicity	:	300 mg/kg

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estimate	:	Central nervous system effects narcosis eye effects
Oral Acute toxicity estimate	:	100 mg/kg Central nervous system effects narcosis eye effects
Skin irritation	:	No skin irritation, Rabbit
Eye irritation	:	Slight or no eye irritation, Rabbit Slight irritation observed but insufficient to warrant classification
Skin sensitization	:	Does not cause skin sensitisation., Guinea pig
Repeated dose toxicity	:	Inhalation Monkey - 29 Months vapour No toxicological effects warranting significant target organ toxicity classification were seen below the recommended guidance values for classification.
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. Did not cause genetic damage in cultured mammalian cells.
Reproductive toxicity	:	No toxicity to reproduction Evidence suggests the substance is not a reproductive toxin in animals.
Teratogenicity	:	Evidence suggests the substance is not a developmental toxin in animals.
Ethanol		
Inhalation 4 h LC50	:	124.7 mg/l , Rat Necrosis (tissue death) Nasal or ocular discharge Respiratory effects

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Dermal LD50	:	17,100 mg/kg , Rabbit Information given is based on data obtained from similar substances.
Oral LD50	:	10,470 mg/kg , Rat Central nervous system effects
Skin irritation	:	No skin irritation, Rabbit
Eye irritation	:	Irritation to eyes, reversing after 7 to 21 days, Rabbit
Skin sensitization	:	Does not cause skin sensitisation., Mouse
Repeated dose toxicity	:	Ingestion Mouse - 90 d NOAEL: 17,000 mg/kg Method: OECD Test Guideline 408 No toxicologically significant effects were found. Inhalation Rat - 28 d vapour NOAEL: 11.5 mg/l No toxicologically significant effects were found.
Carcinogenicity	:	No evidence of carcinogenicity in animal studies. Overall weight of evidence indicates that the substance is not carcinogenic.
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 Evidence suggests the substance is not a reproductive toxin in animals.
Teratogenicity	:	Evidence suggests the substance is not a developmental toxin in animals.

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).

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Material	IARC	NTP	OSHA
4-Methylpentan-2-one	2B		
Ethanol	1		

SECTION 12. ECOLOGICAL INFORMATION
Aquatic Toxicity
γ-Butyrolactone

96 h LC50	:	Lepomis macrochirus (Bluegill sunfish) 56 mg/l OECD Test Guideline 203
72 h EC50	:	Desmodesmus subspicatus (green algae) > 1,000 mg/l DIN 38412
72 h EC10	:	Desmodesmus subspicatus (green algae) 84.4 mg/l DIN 38412
48 h EC50	:	Daphnia magna (Water flea) > 500 mg/l Directive 67/548/EEC, Annex V, C.2.

4-Methylpentan-2-one

96 h LC50	:	Danio rerio (zebra fish) > 179 mg/l OECD Test Guideline 203
8 d EC10	:	Algae 136 mg/l ISO 8692
48 h EC50	:	Daphnia magna (Water flea) > 200 mg/l OECD Test Guideline 202
21 d	:	NOEC Daphnia magna (Water flea) 30 - 35 mg/l OECD Test Guideline 211

Methanol

96 h LC50	:	Lepomis macrochirus (Bluegill sunfish) 15,400 mg/l
96 h LC50	:	Selenastrum capricornutum (green algae) 22,000 mg/l
48 h EC50	:	Daphnia (water flea) 18,260 mg/l
28 d	:	NOEC Pimephales promelas (fathead minnow) 446 mg/l
21 d	:	NOEC Daphnia magna (Water flea) 208 mg/l

Ethanol

96 h LC50	:	Pimephales promelas (fathead minnow) 14,200 mg/l
72 h ErC50	:	Algae 275 mg/l OECD Test Guideline 201

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5 d NOEC : Algae 3,240 mg/l
 48 h EC50 : Ceriodaphnia dubia (water flea) 5,012 mg/l
 30 d : NOEC Fish (unspecified species) 245 mg/l

Environmental Fate**γ-Butyrolactone**

Bioaccumulation : Bioaccumulation is unlikely.

4-Methylpentan-2-one

Biodegradability : Biodegradable OECD Test Guideline 301
 Readily biodegradable.

Bioaccumulation : Bioaccumulation is unlikely.

Methanol

Biodegradability : Biodegradable
 Readily biodegradable.

Bioaccumulation : Bioaccumulation is unlikely.

Ethanol

Bioaccumulation : Bioaccumulation 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.

SECTION 14. TRANSPORT INFORMATION

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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.

SECTION 15. REGULATORY INFORMATION

TSCA : In compliance with TSCA-active Inventory requirements for commercial purposes.

SARA 311/312 Hazard classification : Flammable (gases, aerosols, liquids, or solids)
Acute toxicity (any route of exposure)
Serious eye damage or eye irritation
Specific target organ toxicity (single or repeated exposure)
Carcinogenicity

SARA 313 Regulated Chemical(s) : The following components are subject to reporting levels established by SARA Title III, Section 313: 4-Methylpentan-2-one

California Prop. 65 : This product can expose you to 4-Methylpentan-2-one, which is/are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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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