

HD 4110

Version 2.0

Revision Date 03/28/2011

Ref. 130000030676

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 4110
MSDS Number : 130000030676

Product Use : Polyimide coating for semi-conductor industry

Manufacturer : HD Microsystems™
250 Cheesequake Road
Parlin, New Jersey 08859

Product Information : 800-346-5656
Transport Emergency : CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

SECTION 2. HAZARDS IDENTIFICATION

Potential Health Effects

Skin : May cause skin irritation.

Eyes : Contact with eyes may cause irritation.

Inhalation : Altered respiratory rate May cause irritation of respiratory tract.

Ingestion : Effects due to ingestion may include: Kidney effects, Respiratory irritation, Liver effects, Central nervous system.

Repeated exposure : The material may be absorbed through the skin.

Target Organs : Respiratory system, Kidney, Liver, Nervous system

Carcinogenicity

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

HD 4110

Version 2.0

Revision Date 03/28/2011

Ref. 130000030676

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
N-Methyl-2-pyrrolidone	872-50-4	30 - 60 %
Methanol	67-56-1	1 - 5 %
Proprietary Additives		<=15 %
Proprietary Resin		30 - 60 %

SECTION 4. FIRST AID MEASURES

- Skin contact : Take off all contaminated clothing immediately. Wash off with soap and water. Wash contaminated clothing before re-use.
- Eye contact : Rinse thoroughly with plenty of water, also under the eyelids. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
- Inhalation : Move to fresh air. Consult a physician.
- Ingestion : Do NOT induce vomiting. Immediately give plenty of water (if possible charcoal slurry). Call a physician immediately.
- General advice : Never give anything by mouth to an unconscious person.

SECTION 5. FIRE-FIGHTING MEASURES

- Flammable Properties
- Flash point : 93 °C (199 °F)

HD 4110

Version 2.0

Revision Date 03/28/2011

Ref. 130000030676

- Fire and Explosion Hazard : Vapours may form explosive mixtures with air.
- Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
- Unsuitable extinguishing media : High volume water jet
- Firefighting Instructions : In the event of fire, wear self-contained breathing apparatus.
Do not allow run-off from fire fighting to enter drains or water courses.
Evacuate personnel to safe areas.

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) : Evacuate personnel to safe areas. Remove all sources of ignition. Ensure adequate ventilation. Wear respiratory protection. Wear personal protective equipment. Avoid contact with skin, eyes and clothing.
- Spill Cleanup : Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).
- Accidental Release Measures : Do not flush into surface water or sanitary sewer system. Avoid subsoil penetration. Prevent further leakage or spillage if safe to do so.
Dispose of in accordance with local regulations.

SECTION 7. HANDLING AND STORAGE

- Handling (Personnel) : Avoid contact with skin, eyes and clothing. Avoid inhalation of vapour or mist. Provide sufficient air exchange and/or exhaust in work rooms. Take precautionary measures against static discharges. Smoking, eating and drinking should be prohibited in the application area.
Wash hands before breaks and at the end of workday. Wash contaminated clothing before re-use. Keep away from food and drink.
- Handling (Physical Aspects) : Keep away from heat and sources of ignition.

HD 4110

Version 2.0

Revision Date 03/28/2011

Ref. 130000030676

Storage : Keep container closed to prevent contamination.
 Keep away from oxidising agents and strongly acid or alkaline materials.
 Stable under normal conditions.

Storage temperature : > -20 - < -10 °C (> -4 - < 14 °F)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls : Ensure adequate ventilation.

Personal protective equipment

Respiratory protection : Provide adequate ventilation. When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection

: Material: butyl-rubber
 Break through time: 60 min
 Permeation rate: 480 min
 Glove thickness: 0.7 mm
 Additional protection: As the product is a mixture of several substances, the durability of the glove materials cannot be calculated in advance and has to be tested before use., The data about break through time/strength of material are standard values! The exact break through time/strength of material has to be obtained from the producer of the protective glove.

Eye protection : Safety glasses with side-shields

Exposure Guidelines

Exposure Limit Values

N-Methyl-2-pyrrolidone

AEL * (DUPONT) 5 ppm 8 & 12 hr. TWA, Skin

Methanol

PEL: (OSHA) 200 ppm/260 mg/m³ 8 hr. TWA

TLV (ACGIH) 200 ppm TWA

TLV (ACGIH) 250 ppm STEL
 Skin designation

AEL * (DUPONT) 200 ppm 8 & 12 hr. TWA, Skin

HD 4110

Version 2.0

Revision Date 03/28/2011

Ref. 130000030676

Skin designation

Biological Exposure Indices

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

Form	: liquid
Color	: brown
Odor	: aromatic
Water solubility	: partly soluble

SECTION 10. STABILITY AND REACTIVITY

Stability	: Stable at normal temperatures and storage conditions.
Conditions to avoid	: Exposure to sunlight.
Hazardous decomposition products	: Carbon dioxide (CO ₂), carbon monoxide (CO), oxides of nitrogen (NO _x), dense black smoke.
Hazardous reactions	: Hazardous polymerisation does not occur. The material may slowly polymerize if heated or if inerted with nitrogen.

HD 4110

Version 2.0

Revision Date 03/28/2011

Ref. 130000030676

SECTION 11. TOXICOLOGICAL INFORMATION

HD 4110	
Skin irritation	: Irritating to skin.
Eye irritation	: Irritating to eyes.
Sensitisation	: May cause sensitization by skin contact.
N-Methyl-2-pyrrolidone	
Dermal LD50	: > 5,000 mg/kg , rat
Oral LD50	: 4,150 mg/kg , rat
Inhalation 4 h LC50	: > 5.1 mg/l , rat Target Organs: Respiratory Tract Respiratory tract irritation
Repeated dose toxicity	: Oral rat Reduced body weight gain
Carcinogenicity	: Overall weight of evidence indicates that the substance is not carcinogenic.
Mutagenicity	: Did not show mutagenic effects in animal experiments. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Reproductive toxicity	: Animal testing showed effects on reproduction at levels equal to or above those causing parental toxicity.
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
Methanol	
Dermal LDLO	: 393 mg/kg , Monkey
Oral Acute toxicity estimate	: 100 mg/kg

HD 4110

Version 2.0

Revision Date 03/28/2011

Ref. 130000030676

Oral LDLO	:	143 mg/kg , human
Oral	:	multiple species narcosis Liver effects eye effects Central nervous system effects
Inhalation Acute toxicity estimate	:	3 mg/l
Repeated dose toxicity	:	Dermal multiple species mortality Oral Monkey Blindness
Mutagenicity	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Teratogenicity	:	Animal testing showed effects on embryo-foetal development at levels below those causing maternal toxicity. Foetal malformations Delayed foetal development (variations) Reduced growth

SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity		
N-Methyl-2-pyrrolidone		
96 h LC50	:	Oncorhynchus mykiss (rainbow trout) > 500 mg/l
72 h EC50	:	Algae > 500 mg/l
Methanol		
96 h LC50	:	Fathead minnow 28,100 mg/l
48 h EC50	:	Daphnia > 10,000 mg/l

Environmental Fate

HD 4110

Version 2.0

Revision Date 03/28/2011

Ref. 130000030676

N-Methyl-2-pyrrolidone

Biodegradability : Readily biodegradable, according to appropriate OECD test.

Bioaccumulation : Accumulation in aquatic organisms is unlikely.

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

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal : In accordance with local and national regulations.

SECTION 14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

TSCA Status : On the inventory, or in compliance with the inventory

SARA 313 Regulated
Chemical(s) : Methanol , N-Methyl-2-pyrrolidoneCERCLA Reportable
Quantity : 450,450 lbs
Based on the percentage composition of this chemical in the product.:
MethanolCalifornia 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-pyrrolidonePA 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): Methanol , N-Methyl-2-pyrrolidone

HD 4110

Version 2.0

Revision Date 03/28/2011

Ref. 130000030676

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): Methanol

SECTION 16. OTHER INFORMATION

Contact person : HD Microsystems™, Customer Service, 800-346-5656

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.

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