Material Safety Data Sheet

RI-9180

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CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Tradenames and Synonyms

Polyimide Developer

Company Identification

MANUFACTURER/DISTRIBUTOR

HD MicroSystems
Cheesequake Road
Parlin
New Jersey
USA
08859

PHONE NUMBERS

Product Information	:	(800) 346-5656
Transport Emergency	:	(800) 424-9300 (Outside the US (703) 527-3887)
Medical Emergency	:	(800) 441-7515 (Outside the US (302) 774-1000)

COMPOSITION/INFORMATION ON INGREDIENTS

Components

Material	CAS Number	%
Cyclohexanone	108-94-1	10-30
Butyl Acetate	123-86-4	>60

HAZARDS IDENTIFICATION

Potential Health Effects

>>>Cyclohexanone
****Additional animal tests have shown: No genetic damage in animals; No heritable genetic damage in animals; Genetic damage in bacterial or mammalian cell cultures; Tests in some animal demonstrate weak carcinogenic response; Reduced fertility has been observed in animal tests; Developmental effects only at levels producing other toxic effects in adult animal. ****Human health effects of overexposure may include: By contact with liquid or vapor: Eye irritation with discomfort, tearing, or blurring of vision; Defatting (drying) of the skin; BY SKIN CONTACT: Defatting (drying) of the skin; Skin irritation with itching, burning, redness, swelling or rash; Infrequently associated with skin sensitization in humans; BY EYE CONTACT: Eye irritation with

(HAZARDS IDENTIFICATION - Continued)

discomfort, tearing, or blurring of vision; BY INHALATION: Irritation of the upper respiratory passages with coughing and discomfort. ****Human effects of higher level acute, repeated or chronic overexposure may include: By contact with liquid or vapor: Skin irritation with discomfort or rash; BY CONTACT, INHALATION, OR INGESTION: Temporary central nervous system depression with anesthetic effects: dizziness, headache, confusion, incoordination, and loss of consciousness.

Individuals may have increased susceptibility to the hazards of overexposure to ingredient(s) of this product if they have pre- existing diseases of the:
Central nervous system

>>>Butyl Acetate
Skin contact may initially include: skin irritation with discomfort or rash; or allergic skin rashes. The compound has been infrequently associated with skin sensitization in humans. Significant skin permeation, and systemic toxicity, after contact appears unlikely. Eye contact may cause eye irritation with discomfort, tearing, or blurring of vision.

Inhalation may initially include: nonspecific discomfort, such as nausea, headache, or weakness; or irritation of the upper respiratory passages, with coughing.

Based on data from tests with animals higher exposures may lead to these effects: abnormal liver function as detected by laboratory tests; or temporary nervous system depression with anaesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness. Individuals with pre-existing diseases of the central nervous system may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity Information

The following components are listed by IARC, NTP, OSHA or ACGIH as carcinogens.

Material	IARC	NTP	OSHA	ACGIH
Cyclohexanone				A3

FIRST AID MEASURES

First Aid

INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

(FIRST AID MEASURES - Continued)

SKIN CONTACT

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physicians

Activated charcoal mixture may be beneficial. Suspend 50 g activated charcoal in 400 mL water and mix well. Administer 5 mL/kg, or 350 mL for an average adult.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point : 77 F (25 C) Calculated

FIRE & EXPLOSION HAZARDS:
KEEP AWAY FROM SPARKS AND OPEN FLAMES. Do not smoke in area with open product;

The solvent vapors are heavier than air and may travel along the floor to a source of ignition and flashback; Use the product in areas and equipment with appropriate National Electric Code (NEC) classification. Consider the need for spark proof tools;

If the product may be heated above its flashpoint during processing, remove sources of ignition such as open sparks, flames or static discharge to prevent vapor ignition.

Extinguishing Media

Water Spray, Dry Chemical, Carbon Dioxide.

Fire Fighting Instructions

Wear full protective equipment. Thoroughly decontaminate all equipment used in firefighting efforts before returning to service.

(FIRE FIGHTING MEASURES - Continued)

Toxic decomposition products may form under fire conditions. (See Decomposition Section.); Wear a full facepiece, positive pressure, self-contained breathing apparatus (SCBA); Dispose of residues per federal, state, and local regulation. (See Waste Disposal Section.).

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

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

Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus.

Spill Clean Up

Spill, Leak or Release:
FOR SMALL SPILLS, absorb on rags, sand or other absorbent material;

FOR LARGE SPILLS, get workers out of affected area. If flammable liquids or vapors may be present, turn off electrical devices or other sources of sparks or flames.

WEAR PROTECTIVE EQUIPMENT. Use supplied-air respiratory protection if vapor concentrations are not known; Contain spill at source by diking or absorbing with sand. Do not allow spill to spread to or intentionally flush to sewer or ground. Wash area thoroughly. Adequately ventilate area; Spill residue, cleaning rags and absorbent may be considered hazardous. (See Waste Disposal Section.).

HANDLING AND STORAGE

Handling (Personnel)

Avoid contact with eyes, skin or clothing. Do not breathe vapor or mist.

Contaminated clothing and cleaning materials, etc. should be considered hazardous until decontaminated or properly disposed of. (See Waste Disposal Section.).

Material Safety Data Sheet

(HANDLING AND STORAGE - Continued)

Storage

Store product in a refrigerated location(0-4 F), away from sunlight or ultraviolet light to ensure product viscosity stability. Do not store the product in areas where vapors may contact sources of heat, sparks or open flame.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use only with adequate ventilation.

Personal Protective Equipment

Respiratory Protection:
A NIOSH/MSHA approved full-face mask equipped with chemical cartridges approved for methylamine may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, when exposure levels are not known, or in any other circumstances where air purifying respirators may not provide adequate protection; For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air- purifying respirator. In dusty atmospheres, use an approved dust respirator;

Selection of a suitable respirator will depend on the properties of the contaminant(s) and their actual or expected air concentration(s) versus applicable limits. Consult ANSI Standard Z88.2 for decision logic to select appropriate NIOSH/MESA approved respirators; A NIOSH/MSHA/OSHA approved air purifying respiratory with a dust/mist cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known or any other circumstances where air purifying respirators may not provide adequate protection; Use a positive pressure air-supplied respirator if concentrations may exceed exposure limits. Air-purifying respirators are inadequate for this material; If respirators are needed to meet applicable limits, a respiratory protection program up to the level of OSHA Standard 29 CFR 1910.134 is mandatory. This includes air monitoring, selection, medical approval, training, fit testing, inspection, maintenance, cleaning, storage, etc; An OSHA/NIOSH respirator for protection

(EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued)

against Nuisance Dust is recommended.

Respirators with organic vapor cartridges provide adequate protection, within use limitations, for the following components in this product: Cyclohexanone

Gloves:
Gloves should be used when the possibility of skin contact exists; The suitability of a particular glove and glove material should be determined as part of an overall glove program. Considerations may include chemical breakthrough time; permeation rate; abrasion, cut and puncture resistance; flexibility; duration of contact; etc.

Other Protection Practices:
Appropriate eye protection such as chemical splash goggles should be used if the possibility of eye contact exists; Protective outer clothing should be used where the possibility of body contact exists. Contaminated work clothing should not be allowed out of the workplace; Do not smoke, consume or store food or drinks in areas where the product is handled or stored. After handling the product, wash hands thoroughly before leaving the work area;

Additional engineering controls, work practices and training may be required depending on exposure levels. These are discussed in the OSHA Respiratory Protection Standard (29 CFR 1910.134) and OSHA Hazard Communication Standard (29 CFR 1910.1200);

Exposure Guidelines

Applicable Exposure Limits

Cyclohexanone

PEL	(OSHA)	: 50 ppm, 200 mg/m3, 8 Hr. TWA
TLV	(ACGIH)	: 20 ppm, 8 Hr. TWA, Skin, A3 STEL 50 ppm, Skin, A3
AEL *	(DuPont)	: 25 ppm, 8 & 12 Hr. TWA STEL 50 ppm, 15 minute TWA

Butyl Acetate

PEL	(OSHA)	: 150 ppm, 710 mg/m3, 8 Hr. TWA
TLV	(ACGIH)	: 150 ppm, 8 Hr. TWA
AEL *	(DuPont)	: None Established

* 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.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Form	: Liquid.
Color	: Colorless.
Solubility in Water	: Moderately soluble
Odor	: Sweet, Aromatic.

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and recommended storage conditions.

Conditions to Avoid

Reducing agents; Oxidizing agents; Bases; Acids; Strong Acids; Strong Oxidizers; Inert gases; Direct Sunlight.

Incompatibility with Other Materials

Reducing agents; Oxidizing agents; Bases; Acids; Strong Acids; Strong Oxidizers; Inert gases; Direct Sunlight.

Decomposition

Carbon monoxide (CO); Nitrogen oxides; Carbon dioxide; water; Various hydrocarbons

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

>>>Cyclohexanone
Inhalation 4 hour ALC: 2,000 ppm in rats
Skin absorption LD50: 948 mg/kg in rabbits
Oral LD50: 1,535 mg/kg in rats.

>>>Butyl Acetate
Inhalation 4 hour LC50: 9200 ppm in rats
Skin absorption ALD: > 17,652 mg/kg in rabbits
Oral LD50: 14,130 mg/kg in rats

DISPOSAL CONSIDERATIONS

Waste Disposal

Components of this product may be considered hazardous; Consult applicable Federal, State, and local regulations for allowable disposal methods.

Container Disposal

Empty product containers should be considered hazardous until decontaminated or properly disposed of. (See Waste Disposal Section.).

REGULATORY INFORMATION

U.S. Federal Regulations

All Ingredients in This Product Are TSCA Listed/Reported.

No ingredients of this product are subject to the reporting requirements of section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 and 40 CFR part 372.

State Regulations (U.S.)

CALIFORNIA PROPOSITION 65: WARNING: This product does not contain chemical s known to the state of California to cause cancer, birth defects, or other reproductive harm.

Canadian Regulations

CLASS B Division 3 - Combustible Liquid.

D2B

OTHER INFORMATION

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : HD MicroSystems(TM)
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Parlin, NJ 08859
Telephone : (800) 346-5656

End of MSDS