

# Material Safety Data Sheet



**DE-6018**

DE6018

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## CHEMICAL PRODUCT/COMPANY IDENTIFICATION

### Tradenames and Synonyms

Solution

### 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	%
4-Butyrolactone	96-48-0	30-60
*Xylene	1330-20-7	30-60

\* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

## HAZARDS IDENTIFICATION

### Potential Health Effects

This product is a physical mixture. The health effects information about this product is based on the individual ingredients;

**OVERVIEW:** The most likely routes of overexposure to this product are skin contact and inhalation. Skin irritation and/or other effects of skin contact are easily avoided by using proper gloves (see section titled GLOVES) and washing affected areas immediately if contact occurs. Volatile solvents will start evaporating during room temperature use

## Material Safety Data Sheet

## (HAZARDS IDENTIFICATION - Continued)

of the product, such as thinning, pouring from jar to dispensing machine, and spin coating. Mist and solvent vapors will evolve if spray application is used. During wafer drying, 125 - 150 C, and final curing, 350 - 450 C, the remaining solvent(s) will evaporate. Potential overexposure to other chemicals used in the operation such as wafer etchants and cleaners should also be considered. Well designed area and personal air sampling and analysis can show if exposures are within established limits. Properly designed local ventilation and process enclosure are effective ways to limit employee exposure where needed.

In addition to meeting exposure limits, it is always prudent to use all practical means to minimize employee exposure to chemicals. A significant difference in overall exposure can be made with practical measures such as:

- \* Inhalation - minimizing by keeping jars of product covered
- \* Eye - avoiding contact by wearing chemical splash goggles where there is splash potential
- \* Ingestion - avoiding by washing hands before eating, drinking or smoking, and restricting these activities to outside the work area.

## PRINCIPAL HEALTH EFFECTS:

>>>Xylene

\*\*\*\*Additional animal tests have shown: No reproductive toxicity; No genetic damage in animals, bacterial or mammalian cell cultures; No heritable genetic damage. \*\*\*\*Human health effects of overexposure may include: BY SKIN CONTACT: Skin irritation with itching, burning, redness, swelling or rash; BY EYE CONTACT: Eye irritation with discomfort, tearing, or blurring of vision; BY INHALATION: Runny nose; Sore throat; Sneezing; Irritation of the nose and throat; Central nervous system depression with dizziness, confusion, incoordination, drowsiness, or unconsciousness; Nonspecific discomfort, e.g., nausea, headache or weakness; BY INGESTION: Irritation of gastrointestinal tract; Vomiting; Nausea; Central nervous system depression with dizziness, confusion, incoordination, drowsiness, or unconsciousness; Heartburn; Diarrhea; Stomach pain; Nonspecific discomfort, e.g., nausea, headache or weakness. \*\*\*\*Human effects of higher level acute, repeated or chronic overexposure may include: BY SKIN CONTACT: Skin irritation with discomfort or rash; Defatting (drying) of the skin; Skin permeation may occur in amounts capable of producing the effects of systemic toxicity; BY INHALATION: Cardiovascular effects; Pathological changes in the kidneys; Pathological changes in the liver; Blood chemistry effects; Anemia; Fatality from gross overexposure. \*\*\*In addition: BY

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## (HAZARDS IDENTIFICATION - Continued)

SKIN CONTACT: This compound has been infrequently associated with skin sensitization in humans; One published report's limited data suggested high oral doses of xylene caused increased malignant tumors in rats. However, other, more extensive studies have demonstrated no carcinogenic activity; BY INGESTION: Major ingestion hazard is aspiration which may result in "chemical pneumonia". Symptoms include coughing, gasping, choking, shortness of breath, bluish discoloration of the skin, rapid breathing and heart rate, and fever. Pulmonary edema or bleeding, drowsiness, confusion, coma and seizures may occur in more serious cases. Symptoms may be delayed for up to 24 hours.

>>>4-Butyrolactone

\*\*\*\*Toxic effects described in animals include: BY SKIN OR EYE CONTACT: Moderate skin irritation; Moderate eye irritation; No skin sensitization; BY INHALATION: Respiration rate changes; Hyperactivity; Lethargy/inactivity. Toxic effects of repeated or prolonged animal exposures include: BY INHALATION: Respiration rate changes; BY INGESTION: Nasal effects; Lethargy/inactivity; Weight loss; \*\*\*\*Additional animal tests have shown: No carcinogenic activity; No mutagenic toxicity; No developmental toxicity. \*\*\*\*Human health effects of overexposure may include: BY SKIN OR EYE CONTACT: Skin irritation with discomfort or rash; Eye irritation with discomfort, tearing, or blurring of vision. \*\*\*\*Human effects of higher level acute, repeated or chronic overexposure may include: Irritation of the upper respiratory passages with coughing and discomfort; Temporary central nervous system depression with anaesthetic effects: dizziness, headache, confusion, incoordination, and loss of consciousness; BY INHALATION: Irritation of the upper respiratory passages with coughing and discomfort. \*\*\*In addition: Skin permeation can occur in amounts capable of producing effects of systemic toxicity.

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; Cardiovascular system; Bone marrow; Lungs; Liver; Kidneys.

## Carcinogenicity Information

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

## Material Safety Data Sheet

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FIRST AID MEASURES  
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## First Aid

## INHALATION

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

## 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.

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FIRE FIGHTING MEASURES  
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## Flammable Properties

Flash Point : 95 F (35 C)

Method: Calculated.

## FIRE &amp; 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.

## Material Safety Data Sheet

## (FIRE FIGHTING MEASURES - Continued)

## 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.

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.).

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ACCIDENTAL RELEASE MEASURES

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## 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.).

## Material Safety Data Sheet

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HANDLING AND STORAGE  
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## Handling (Personnel)

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

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EXPOSURE CONTROLS/PERSONAL PROTECTION  
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## 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

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## (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: Xylene;

**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);

Do not breath dust. Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling.

**Exposure Guidelines****Applicable Exposure Limits****Xylene**

PEL (OSHA)	:	100 ppm, 435 mg/m <sup>3</sup> , 8 Hr. TWA
TLV (ACGIH)	:	100 ppm, 8 Hr. TWA, A4 STEL 150 ppm, A4
AEL * (DuPont)	:	100 ppm, 8 & 12 Hr. TWA 150 ppm, 15 minute TWA

\* 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.

## Material Safety Data Sheet

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PHYSICAL AND CHEMICAL PROPERTIES  
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## Physical Data

Form : Liquid.  
Color : Colorless.  
Solubility in Water : High to Miscible  
Odor : Aromatic.

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STABILITY AND REACTIVITY  
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## 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.

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TOXICOLOGICAL INFORMATION  
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## Animal Data

## &gt;&gt;&gt;Xylene

Inhalation 4 hour LC50: 6,700 ppm in rats  
Skin absorption LD50: 4,320 mg/kg in rabbits  
Oral ALD: 4,500 mg/kg in rats

## &gt;&gt;&gt;4-Butyrolactone

Inhalation 4 hour LC50: >5.1 mg/L in rats  
Skin absorption LD50: >10 mL/kg in guinea pigs  
Oral LD50: 800-1600 mg/kg in rats.

## Material Safety Data Sheet

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DISPOSAL CONSIDERATIONS  
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## 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.).

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REGULATORY INFORMATION  
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## U.S. Federal Regulations

All Ingredients in This Product Are TSCA Listed/Reported.

The following ingredients 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:

INGREDIENT(S)	Weight %
Xylene, 1330-20-7	30 - 60%

## Canadian Regulations

CLASS B Division 2 - Flammable Liquid.

D2B

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OTHER INFORMATION  
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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)  
Telephone : 800-346-5656

End of MSDS