



Arch Chemicals, Inc.

# MATERIAL SAFETY DATA

FOR ANY EMERGENCY, CALL 24HOURS/ 7 DAYS:	<b>1-800-654-6911</b>
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC(R):	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL:	1-800-511-MSDS

PRODUCT NAME: **DURIMIDE™ 7520**

## I. PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE: 10-11-2001  
SUPERCEDES: 10-10-2001  
MSDS NO: 01635-0046 - 851355  
SYNONYMS: None  
CHEMICAL FAMILY: Photosensitive polyimide precursor solution  
DESCRIPTION / USE: Manufacture of microelectronic devices  
FORMULA: Not applicable/Mixture

Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204

## II. COMPOSITION/INFORMATION ON INGREDIENTS

CAS or CHEMICAL NAME	CAS #	% Range
N-methyl-2-pyrrolidone	872-50-4	50 - 70
Polyamic acid ester	LVE-94-142	25 - 40
Methacrylate monomer	109-17-1	4 - 6
Organotitanium complex	Proprietary	0.8 - 1.5

## III. HAZARDS IDENTIFICATION

**OSHA Hazard Classification: possible weak skin sensitizer, combustible liquid, eye irritant, skin irritant, respiratory irritant, liver toxin, lung toxin**

Routes of Entry: Inhalation, skin, eyes, ingestion  
Chemical Interactions: No known interactions  
Medical Conditions Aggravated: Respiratory diseases including asthma and bronchitis, Pre-existing liver diseases, Dermatitis may be aggravated following exposure.

#### Human Threshold Response Data

Odor Threshold: Not established  
Irritation Threshold: Not established

#### Hazardous Materials Identification System/National Fire Protection Association Classifications

<u>Hazard Ratings:</u>	<u>Health</u>	<u>Flammability</u>	<u>Reactivity</u>
HMIS	2	2	0
NFPA	Not established		

#### Immediate (Acute) Health Effects

Inhalation Toxicity: Not expected to be toxic by inhalation. Exposure to high concentrations may result in alterations to the liver.  
High concentrations may cause nausea and dizziness.

Inhalation Irritation: High concentrations are moderately irritating to the eyes, nose, throat, and lungs.

Skin Contact: Skin contact may cause moderate irritation consisting of transient redness and swelling. This irritant effect would not be expected to result in permanent damage.

Eye Contact: May cause severe irritation, consisting of redness, swelling, and mucous membrane discharge to the conjunctiva. Any visual impairment or corneal damage would be expected to clear within several days. Reversible corneal opacity or visual impairment may occur if this product is not washed out promptly and left in the eye for an extended period of time.

Ingestion Irritation: Ingestion may cause irritation of the gastrointestinal tract and gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting, lethargy or diarrhea.

Ingestion Toxicity: Not expected to be toxic by ingestion unless large amounts are swallowed.

Acute Target Organ Toxicity: Eyes, Skin, Respiratory Tract, Liver

#### Prolonged (Chronic) Health Effects

Carcinogenicity: This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

Reproductive and Developmental Toxicity: Not known or reported to cause reproductive or developmental toxicity.

Sensitization: May cause allergic skin sensitization in some individuals.

Inhalation: Prolonged or repeated exposure will cause more severe irritation and possibly lung damage.

Skin Contact: Dermal contact may cause defatting of skin and/or dermatitis.

Ingestion: There are no known or reported effects from chronic ingestion except for effects similar to those experienced from single exposure.

Chronic Target Organ Toxicity: Skin, Liver, Lungs

Supplemental Health Hazard Information: No additional health information available.

#### **IV. FIRST AID**

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Inhalation: IF INHALED: Remove individual to fresh air. Seek medical attention if breathing becomes difficult.

Skin Contact: IF ON SKIN: Immediately flush skin with plenty of water for 15 minutes. If clothing comes in contact with the product, the clothing should be removed immediately and laundered before re-use. Call a physician.

Eyes: IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes while holding eyelids apart. Call a physician immediately.  
Ingestion: IF SWALLOWED: Immediately drink water to dilute. Consult a physician if symptoms develop. Never give anything by mouth to an unconscious person.

## **V. FIRE FIGHTING MEASURES**

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Flammability Summary (OSHA): Combustible.

### Flammable Properties

Flash Point: Approximately 81 Deg. C. / 178 Deg. F. (Test Method: Cleveland Closed Cup)

Autoignition Temperature: No data

Upper Flammable/Explosive Limit, % in air: No data

Lower Flammable/Explosive Limit, % in air: No data

Fire/Explosion Hazards: Material may be ignited if preheated to temperatures above the flash point in the presence of a source of ignition.

Extinguishing Media: Use alcohol foam, carbon dioxide, dry chemical or water spray when fighting fires. Water or foam may cause frothing if liquid solvent or oil is burning but it still may be a useful extinguishing agent if carefully applied to the fire.

Fire Fighting Instructions: In case of fire, use normal fire fighting equipment including a NIOSH approved self-contained breathing apparatus (SCBA). Use water to cool containers.

Hazardous Combustion Products: carbon monoxide, carbon dioxide, Oxides of nitrogen

## **VI. ACCIDENTAL RELEASE MEASURES**

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Personal Protection for Emergency Situations: Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to boots, impervious gloves, hard hat, splash-proof goggles, impervious clothing, i.e., chemically impermeable suit, self-contained breathing apparatus.

### Spill Mitigation Procedures

Air Release: Hazardous concentrations in air may be found in local spill area and immediately downwind. Vapors may be suppressed by the use of water fog. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste.

Water Release: This material is heavier than and slightly soluble in water. Notify all downstream users of possible contamination. Divert water flow around spill if possible and safe to do so. Contain all liquid for treatment and/or disposal as a (potential) hazardous waste. Continue to handle as described in land spill.

Land Release: Create a dike or trench to contain materials. Absorb spill with inert material (e.g., dry sand, clay, earth or commercial absorbent), then place in a chemical waste container. Decontaminate all clothing and the spill area using a detergent and flush with large amounts of water. Contain all contaminated water for disposal and/or treatment.

Additional Spill Information: Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel. Utilize emergency response personal protection equipment prior to the start of any response. Evacuate all non-essential personnel. Dispose of spill residues per guidelines under Section XIII, Disposal Consideration.

## VII. HANDLING AND STORAGE

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Handling: Do not take internally. Avoid contact with skin, eyes and clothing. Upon contact with skin or eyes, wash off with water. Avoid breathing mist or vapor. Ground and bond containers when transferring material.

Storage: Store in a cool dry ventilated location, away from sources of ignition or other incompatible conditions and chemicals. Keep container(s) closed. Avoid direct exposure to sunlight or ultraviolet (UV) light sources.  
Keep refrigerated.

Shelf Life Limitations: See label or certificate of analysis for shelf life if applicable.

Incompatible Materials for Storage: Refer to Section X, "Incompatible Materials."

Do Not Store At temperatures Above: -15 Deg. C. 5 Deg. F.

Do Not Store At Temperatures Below: -20 Deg. C. -4 Deg. F.

## VIII. EXPOSURE CONTROLS / PERSONAL PROTECTION

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Ventilation: Local exhaust ventilation or other engineering controls are normally required when handling or using this product.

### Protective Equipment for Routine Use of Product

Respiratory Protection: Wear a NIOSH approved respirator if levels above the exposure limits are possible.

Respirator Type(s): NIOSH approved air purifying respirator with organic vapor cartridge and dust/mist filter. Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or if exposure concentrations exceed ten (10) times the published limit.

Skin: Avoid skin contact by wearing gloves, an apron and other protective equipment depending upon conditions of use. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Do not wear surgical style latex gloves except to protect against incidental contact with the material. Wash hands and other exposed areas with mild soap and water before eating, drinking, smoking, and when leaving work.

Eyes: Use chemical goggles.

Protective Clothing Type: Impervious

### Exposure Limit Data

CHEMICAL NAME	CAS #	OSHA PEL / STEL	ACGIH LIMITS	ACGIH WEEL
1-Methyl-2-pyrrolidone	872-50-4	None established	None established	10 ppm TWA; 40 mg/m <sup>3</sup> TWA skin absorber

CHEMICAL NAME NIOSH Immediately Dangerous to Life or Health:  
The IDLH has not been established for this product.

## IX. PHYSICAL DATA

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Physical State: viscous liquid

Color: yellow

Odor: mild characteristic

Molecular Weight: Not Applicable/Mixture

pH: (@ 25 Deg. C) Not applicable

Octanol/Water Coeff:	No data
Solubility in Water:	50.00 - 70.00 %
Bulk Density:	1.16 g/cc
Specific Gravity:	(@ 25 Deg. C) 1.16
Vapor Density:	> 1.00 (air =1)
Vapor Pressure:	(@ 25 Deg. C) No data
Evaporation Rate:	No data
Boiling Point:	Approximately 203 Deg. C. Approximately 397 Deg. F.
Freezing Point:	No data
Volatiles, % by vol.:	50 - 70 %
VOC Content % w/w / lbs/gal:	60.07 / 5.81
HAP Content % w/w / lbs/gal:	0.07 / 0.01

## **X. STABILITY AND REACTIVITY**

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Stability and Reactivity Summary:	Stable under normal conditions. Static discharge may cause ignition at temperatures at or above the flash point.
Reactive Properties:	Combustible, Not sensitive to mechanical shock., Product is sensitive to electrical static discharge.
Hazardous Polymerization:	Will not occur
Conditions to Avoid:	Sparks, open flame, other ignition sources, and elevated temperatures.
Chemical Incompatibility:	strong oxidizing agents, acids
Decomposition Temperature:	No data
Product May Be Unstable At Temperatures Above:	No data

## **XI. TOXICOLOGICAL INFORMATION**

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### Component Animal Toxicology

Oral LD50 value:	
N-methyl-2-pyrrolidone	Oral LD50 Rat = 3.9 mg/kg
Dermal LD50 value:	
N-methyl-2-pyrrolidone	Dermal LD50 Rabbit = 8 g/kg
Inhalation LC50 value:	No data

### Product Animal Toxicity

Oral LD50 value:	Rat Approximately 2 g/kg
Dermal LD50 value:	Rabbit Believed to be > 2 g/kg
Inhalation LC50 value:	No data
Skin Irritation:	This material is expected to be moderately irritating.
Eye Irritation:	This material is expected to be severely irritating.
Skin Sensitization:	May cause allergic skin sensitization in some individuals.
Reproductive and Developmental Toxicity:	Not known or reported to cause reproductive or developmental toxicity.
Component Data:	
N-methyl-2-pyrrolidone	Animal testing has shown evidence of fetal toxicity (preimplantation loss and delayed ossification) in the absence of maternal toxicity. No structural malformations were observed without the presence of maternal toxicity.
Mutagenicity:	Not known or reported to be mutagenic.
Component Data:	
N-methyl-2-pyrrolidone	This chemical has been shown to be non-mutagenic based on a battery of assays.

Carcinogenicity: This chemical is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.

Component Data:  
N-methyl-2-pyrrolidone This material did not cause cancer in long-term animal studies.

## **XII. ECOLOGICAL INFORMATION**

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Ecological Toxicity Values:

N-methyl-2-pyrrolidone Bluegill LC50 = 832 mg/l.  
Fathead minnow, LC50 = 1072 mg/l.  
Rainbow trout (Salmo gairdneri), LD 50 = 3048 mg/l.

## **XIII. DISPOSAL CONSIDERATIONS**

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**CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.**

Waste Disposal Summary: If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D.

Potential US EPA Waste Codes: Not applicable

Disposal Methods: As a nonhazardous liquid waste, it should be disposed of in accordance with local, state and federal regulations by incineration.

Components subject to land ban restrictions: No components subject to land ban restrictions.

## **XIV. TRANSPORTATION INFORMATION**

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THIS MATERIAL IS NOT REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT Description (49 CFR 172.101):

Land (U.S. DOT): NOT REGULATED

Air (IATA/ICAO): Not Regulated

Water (IMO): Not Regulated

Flash Point: (C) >61

## **XV. REGULATORY INFORMATION**

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UNITED STATES:

Toxic Substances Control Act (TSCA): The components of this product are either listed on the Toxic Substances Control Act Chemical Substances Inventory or are introduced into commerce in accordance with the provisions of a low volume PMN exemption notification.

Pesticide acceptance indication: US EPA Registration Number: Not applicable

Superfund Amendments and Reauthorization Act (SARA) Title III:

Hazard Categories Sections 311/312 (40 CFR 370.2):

Health: Chronic  
Acute  
Physical: Fire

Emergency Planning & Community Right to Know (40 CFR 355, App. A):

Extremely Hazardous Substance Section 302 - Threshold Planning Quantity:

Not applicable

Reportable Quantity (40 CFR 302.4):

None listed

Supplier Notification Requirements (40 CFR 372.45), 313 Reportable Components

N-Methyl-2-pyrrolidinone form R reporting required for 1.0% de minimis concentration

Clean Air Act VOC Section 111

1-Methyl-2-pyrrolidinone

State Right-to-Know Regulations Status of Ingredients

Pennsylvania: 2-Pyrrolidinone, 1-methyl-

New Jersey: Not listed

Massachusetts: 1-Methyl-2-pyrrolidinone

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 - Proposition 65: "WARNING: This product contains a chemical(s) known to the State of California to cause cancer and/or birth defects or other reproductive harm."

CAS or CHEMICAL NAME

CAS #

1-Methyl-2-pyrrolidinone

872-50-4

Reproductive, initial date June 15, 2001

**XVI. ADDITIONAL INFORMATION**

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MSDS REVISION

Revised to meet the ANSI standard of 16 sections.

STATUS:

Section(s) Revised:

15

MAJOR REFERENCES:

- Workplace Environmental Exposure Level Guide (WEEL Guide), n-Methyl-2-Pyrrolidinone. American Industrial Hygiene Association, Fairfax, VA, 1998.

Other references available upon request.

THIS MATERIAL SAFETY DATA SHEET (MSDS) HAS BEEN PREPARED IN COMPLIANCE WITH THE FEDERAL OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200. THE INFORMATION IN THIS MSDS SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. ARCH CHEMICALS BELIEVES THIS INFORMATION TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION BUT, MAKES NO WARRANTY THAT IT IS. ADDITIONALLY, IF THIS MSDS IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ARCH CHEMICALS MSDS CONTROL AT THE PHONE NUMBER ON THE FRONT PAGE TO MAKE CERTAIN THAT THIS DOCUMENT IS CURRENT.