



## Safety Data Sheet

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### SECTION 1: Identification

#### 1.1. Product identifier

3M™ Thermal Bonding Film AF42

#### Product Identification Numbers

LA-M100-0642-0, 62-2197-0451-7, 62-2197-1701-4, 62-2197-2001-8, 62-2197-4701-1, 62-2197-5915-6, 70-0711-4172-8

#### 1.2. Recommended use and restrictions on use

##### Recommended use

Adhesive

#### 1.3. Supplier's details

<b>MANUFACTURER:</b>	3M
<b>DIVISION:</b>	Electronics Materials Solutions Division
<b>ADDRESS:</b>	3M Center, St. Paul, MN 55144-1000, USA
<b>Telephone:</b>	1-888-3M HELPS (1-888-364-3577)

#### 1.4. Emergency telephone number

1-800-364-3577 or (651) 737-6501 (24 hours)

### SECTION 2: Hazard identification

#### 2.1. Hazard classification

Serious Eye Damage/Irritation: Category 2A.

Skin Sensitizer: Category 1.

#### 2.2. Label elements

##### Signal word

Warning

##### Symbols

Exclamation mark |

##### Pictograms

**Hazard Statements**

Causes serious eye irritation.

May cause an allergic skin reaction.

**Precautionary Statements****Prevention:**

Avoid breathing dust/fume/gas/mist/vapors/spray.

Wear protective gloves and eye/face protection.

Wash thoroughly after handling.

Contaminated work clothing must not be allowed out of the workplace.

**Response:**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

IF ON SKIN: Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical advice/attention.

Wash contaminated clothing before reuse.

**Disposal:**

Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

**2.3. Hazards not otherwise classified**

None.

39% of the mixture consists of ingredients of unknown acute inhalation toxicity.

## SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
polyamide resin	25191-90-6	40 - 70
epoxy resin	25068-38-6	15 - 40 Trade Secret *
dicyandiamide	461-58-5	1 - 5
caprolactam	105-60-2	1 - 5 Trade Secret *

\*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

## SECTION 4: First aid measures

**4.1. Description of first aid measures****Inhalation:**

Remove person to fresh air. If you feel unwell, get medical attention.

**Skin Contact:**

Immediately wash with soap and water. Remove contaminated clothing and wash before reuse. If signs/symptoms develop,

get medical attention.

**Eye Contact:**

Immediately flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. Get medical attention.

**If Swallowed:**

Rinse mouth. If you feel unwell, get medical attention.

**4.2. Most important symptoms and effects, both acute and delayed**

See Section 11.1. Information on toxicological effects.

**4.3. Indication of any immediate medical attention and special treatment required**

Not applicable

## SECTION 5: Fire-fighting measures

**5.1. Suitable extinguishing media**

Material will not burn. Non-combustible. Use a fire fighting agent suitable for surrounding fire.

**5.2. Special hazards arising from the substance or mixture**

Closed containers exposed to heat from fire may build pressure and explode.

**Hazardous Decomposition or By-Products**

**Substance**

Carbon monoxide

Carbon dioxide

Oxides of Nitrogen

Toxic Vapor, Gas, Particulate

**Condition**

During Combustion

During Combustion

During Combustion

During Combustion

**5.3. Special protective actions for fire-fighters**

No special protective actions for fire-fighters are anticipated.

## SECTION 6: Accidental release measures

**6.1. Personal precautions, protective equipment and emergency procedures**

Evacuate area. Ventilate the area with fresh air. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

**6.2. Environmental precautions**

Avoid release to the environment.

**6.3. Methods and material for containment and cleaning up**

Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue. Seal the container. Dispose of collected material as soon as possible.

## SECTION 7: Handling and storage

**7.1. Precautions for safe handling**

Avoid breathing of dust created by cutting, sanding, grinding or machining. For industrial or professional use only. Avoid breathing dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wash contaminated clothing before reuse.

**7.2. Conditions for safe storage including any incompatibilities**

No special storage requirements.

**SECTION 8: Exposure controls/personal protection****8.1. Control parameters****Occupational exposure limits**

If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

<b>Ingredient</b>	<b>C.A.S. No.</b>	<b>Agency</b>	<b>Limit type</b>	<b>Additional Comments</b>
caprolactam	105-60-2	ACGIH	TWA(inhalable fraction and vapor):5 mg/m <sup>3</sup>	A5: Not suspected human carcin

ACGIH : American Conference of Governmental Industrial Hygienists

AIHA : American Industrial Hygiene Association

CMRG : Chemical Manufacturer's Recommended Guidelines

OSHA : United States Department of Labor - Occupational Safety and Health Administration

TWA: Time-Weighted-Average

STEL: Short Term Exposure Limit

CEIL: Ceiling

**8.2. Exposure controls****8.2.1. Engineering controls**

Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

**8.2.2. Personal protective equipment (PPE)****Eye/face protection**

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:

Indirect Vented Goggles

**Skin/hand protection**

Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.

Gloves made from the following material(s) are recommended: Neoprene

Nitrile Rubber

Natural Rubber

If this product is used in a manner that presents a higher potential for exposure (eg. spraying, high splash potential etc.), then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following protective clothing material(s) are recommended: Apron - Neoprene

Apron – Nitrile

**Respiratory protection**

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:

Half facepiece or full facepiece air-purifying respirator suitable for organic vapors and particulates

For questions about suitability for a specific application, consult with your respirator manufacturer.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

<b>General Physical Form:</b>	Solid
<b>Specific Physical Form:</b>	Film
<b>Odor, Color, Grade:</b>	Translucent or black; no odor
<b>Odor threshold</b>	<i>No Data Available</i>
<b>pH</b>	<i>Not Applicable</i>
<b>Melting point</b>	<i>No Data Available</i>
<b>Boiling Point</b>	<i>Not Applicable</i>
<b>Flash Point</b>	>=200 °F
<b>Evaporation rate</b>	<i>Not Applicable</i>
<b>Flammability (solid, gas)</b>	Not Classified
<b>Flammable Limits(LEL)</b>	<i>Not Applicable</i>
<b>Flammable Limits(UEL)</b>	<i>Not Applicable</i>
<b>Vapor Pressure</b>	<i>Not Applicable</i>
<b>Vapor Density</b>	<i>Not Applicable</i>
<b>Density</b>	0.65 g/cm <sup>3</sup>
<b>Specific Gravity</b>	0.65 [Ref Std: WATER=1]
<b>Solubility in Water</b>	Nil
<b>Solubility- non-water</b>	<i>No Data Available</i>
<b>Partition coefficient: n-octanol/ water</b>	<i>No Data Available</i>
<b>Autoignition temperature</b>	<i>Not Applicable</i>
<b>Decomposition temperature</b>	<i>No Data Available</i>
<b>Viscosity</b>	<i>No Data Available</i>
<b>Volatile Organic Compounds</b>	<i>No Data Available</i>
<b>Percent volatile</b>	<i>No Data Available</i>
<b>VOC Less H<sub>2</sub>O &amp; Exempt Solvents</b>	<i>No Data Available</i>

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

### 10.2. Chemical stability

Stable.

### 10.3. Possibility of hazardous reactions

Hazardous polymerization may occur.

### 10.4. Conditions to avoid

Avoid curing large quantities of material to prevent a premature reaction (exotherm) with production of intense heat and smoke.

### 10.5. Incompatible materials

None known.

### 10.6. Hazardous decomposition products

#### Substance

None known.

#### Condition

Refer to section 5.2 for hazardous decomposition products during combustion.

## SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

### 11.1. Information on Toxicological effects

#### Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

##### Inhalation:

Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

##### Skin Contact:

Mild Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, and dryness. Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

##### Eye Contact:

Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

##### Ingestion:

Physical Blockage: Signs/symptoms may include cramping, abdominal pain, and constipation.

Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

#### Toxicological Data

If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

##### Acute Toxicity

Name	Route	Species	Value
Overall product	Inhalation-Dust/Mist(4 hr)		No data available; calculated ATE > 12.5 mg/l
Overall product	Ingestion		No data available; calculated ATE > 5,000 mg/kg
epoxy resin	Dermal	Rat	LD50 > 1,600 mg/kg
epoxy resin	Ingestion	Rat	LD50 > 1,000 mg/kg
dicyandiamide	Dermal	Rabbit	LD50 > 10,000 mg/kg
dicyandiamide	Ingestion	Rat	LD50 > 30,000 mg/kg
caprolactam	Dermal	Rat	LD50 > 2,000 mg/kg
caprolactam	Inhalation-Dust/Mist (4 hours)	Rat	LC50 8.2 mg/l
caprolactam	Ingestion	Rat	LD50 1,475 mg/kg

ATE = acute toxicity estimate

##### Skin Corrosion/Irritation

Name	Species	Value
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epoxy resin	Rabbit	Mild irritant
dicyandiamide	Human and animal	Minimal irritation
caprolactam	official classification	Irritant

**Serious Eye Damage/Irritation**

Name	Species	Value
epoxy resin	Rabbit	Moderate irritant
dicyandiamide	Professional judgement	Mild irritant
caprolactam	official classification	Severe irritant

**Skin Sensitization**

Name	Species	Value
epoxy resin	Human and animal	Sensitizing
dicyandiamide	Guinea pig	Some positive data exist, but the data are not sufficient for classification
caprolactam	Guinea pig	Not sensitizing

**Respiratory Sensitization**

Name	Species	Value
epoxy resin	Human	Some positive data exist, but the data are not sufficient for classification

**Germ Cell Mutagenicity**

Name	Route	Value
epoxy resin	In vivo	Not mutagenic
epoxy resin	In Vitro	Some positive data exist, but the data are not sufficient for classification
dicyandiamide	In Vitro	Not mutagenic
caprolactam	In Vitro	Not mutagenic
caprolactam	In vivo	Not mutagenic

**Carcinogenicity**

Name	Route	Species	Value
epoxy resin	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification
dicyandiamide	Ingestion	Rat	Not carcinogenic
caprolactam	Ingestion	Multiple animal species	Not carcinogenic

**Reproductive Toxicity****Reproductive and/or Developmental Effects**

Name	Route	Value	Species	Test Result	Exposure Duration
epoxy resin	Ingestion	Not toxic to female reproduction	Rat	NOAEL 750 mg/kg/day	2 generation
epoxy resin	Ingestion	Not toxic to male reproduction	Rat	NOAEL 750	2 generation

				mg/kg/day	
epoxy resin	Dermal	Not toxic to development	Rabbit	NOAEL 300 mg/kg/day	during organogenesis
epoxy resin	Ingestion	Not toxic to development	Rat	NOAEL 750 mg/kg/day	2 generation
dicyandiamide	Ingestion	Not toxic to female reproduction	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
dicyandiamide	Ingestion	Not toxic to male reproduction	Rat	NOAEL 1,000 mg/kg/day	44 days
dicyandiamide	Ingestion	Not toxic to development	Rat	NOAEL 1,000 mg/kg/day	premating & during gestation
caprolactam	Ingestion	Not toxic to female reproduction	Rat	NOAEL 833 mg/kg/day	3 generation
caprolactam	Ingestion	Not toxic to male reproduction	Rat	NOAEL 833 mg/kg/day	3 generation
caprolactam	Ingestion	Some positive developmental data exist, but the data are not sufficient for classification	Rabbit	NOAEL 50 mg/kg/day	during organogenesis

### Target Organ(s)

#### Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
caprolactam	Inhalation	respiratory irritation	May cause respiratory irritation	Human	LOAEL 0.056 mg/l	not available

#### Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
epoxy resin	Dermal	liver	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1,000 mg/kg/day	2 years
epoxy resin	Dermal	nervous system	All data are negative	Rat	NOAEL 1,000 mg/kg/day	13 weeks
epoxy resin	Ingestion	auditory system   heart   endocrine system   hematopoietic system   liver   eyes   kidney and/or bladder	All data are negative	Rat	NOAEL 1,000 mg/kg/day	28 days
dicyandiamide	Ingestion	kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 6,822 mg/kg/day	13 weeks
caprolactam	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 0.070 mg/l	13 weeks
caprolactam	Inhalation	nervous system   eyes	All data are negative	Rat	NOAEL 0.243 mg/l	13 weeks
caprolactam	Ingestion	kidney and/or bladder	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 33 mg/kg/day	90 days
caprolactam	Ingestion	endocrine system   liver   nervous system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 1,333 mg/kg/day	90 days
caprolactam	Ingestion	hematopoietic system	All data are negative	Rat	NOAEL 667 mg/kg/day	90 days

### Aspiration Hazard

For the component/components, either no data are currently available or the data are not sufficient for classification.



Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

## SECTION 12: Ecological information

### Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

### Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

## SECTION 13: Disposal considerations

### 13.1. Disposal methods

Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of completely cured (or polymerized) material in a permitted industrial waste facility. As a disposal alternative, incinerate uncured product in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

**EPA Hazardous Waste Number (RCRA):** Not regulated

## SECTION 14: Transport Information

For Transport Information, please visit <http://3M.com/Transportinfo> or call 1-800-364-3577 or 651-737-6501.

## SECTION 15: Regulatory information

### 15.1. US Federal Regulations

Contact 3M for more information.

#### 311/312 Hazard Categories:

Fire Hazard - No   Pressure Hazard - No   Reactivity Hazard - No   Immediate Hazard - Yes   Delayed Hazard - No

### 15.2. State Regulations

Contact 3M for more information.

### 15.3. Chemical Inventories

The components of this material are in compliance with the provisions of Australia National Industrial Chemical Notification and Assessment Scheme (NICNAS). Certain restrictions may apply. Contact the selling division for additional information.

The components of this product are in compliance with the new substance notification requirements of CEPA.

The components of this material are in compliance with the China "Measures on Environmental Management of New

Chemical Substance". Certain restrictions may apply. Contact the selling division for additional information.

The components of this material are in compliance with the provisions of Philippines RA 6969 requirements. Certain restrictions may apply. Contact the selling division for additional information.

The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact 3M for more information.

## 15.4. International Regulations

Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

## SECTION 16: Other information

### NFPA Hazard Classification

**Health:** 2 **Flammability:** 0 **Instability:** 1 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

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