



## Safety Data Sheet

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<b>Document Group:</b>	10-8380-7	<b>Version Number:</b>	40.00
<b>Issue Date:</b>	03/15/23	<b>Supersedes Date:</b>	09/15/20

### SECTION 1: Identification

#### 1.1. Product identifier

3M™ Thermal Bonding Film 588

#### Product Identification Numbers

44-0004-1783-0, 62-0037-0151-3, 62-0037-1811-1, 62-0037-2001-8, 62-0037-2801-1, 62-0037-3301-1, 62-0037-4101-4, 62-0037-4701-1, 62-0037-4721-9, 70-0025-1213-8, 70-0060-1574-0, 70-0060-2118-5, 70-0060-2259-7, 70-0060-3959-1, 70-0063-3561-9, 70-0063-3593-2, 70-0063-3647-6, 70-0063-3651-8, 70-0063-3652-6, 70-0063-3653-4, 70-0160-2352-8, 7000142778, 7000046313, 7010365895, 7010330012, 7000046314, 7000046315, 7000001105, 7100047882, 7000001158, 7000048414, 7000048450, 4010045988, 7100058018, 7000001275, 7010302062, 4010045175

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

##### Recommended use

Adhesive, bonding

#### 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 Corrosion/Irritation: Category 2.

Skin Sensitizer: Category 1.

Carcinogenicity: Category 1B.

Specific Target Organ Toxicity (single exposure): Category 1.

Specific Target Organ Toxicity (repeated exposure): Category 1.

#### 2.2. Label elements

##### Signal word

Danger

**Symbols**

Exclamation mark | Health Hazard |

**Pictograms****Hazard Statements**

Causes serious eye irritation.

Causes skin irritation.

May cause an allergic skin reaction.

May cause cancer.

Causes damage to organs:

blood or blood-forming organs |

cardiovascular system |

nervous system |

kidney/urinary tract |

respiratory system |

Causes damage to organs through prolonged or repeated exposure:

blood or blood-forming organs |

cardiovascular system |

liver |

kidney/urinary tract |

respiratory system |

May cause damage to organs through prolonged or repeated exposure:

nervous system |

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

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Do not breathe dust/fume/gas/mist/vapors/spray.

Wear protective gloves and eye/face protection.

Do not eat, drink or smoke when using this product.

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.

Take off contaminated clothing and wash it before reuse.

IF exposed or concerned: Get medical advice/attention.

**Disposal:**

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

5% of the mixture consists of ingredients of unknown acute oral toxicity.  
 5% of the mixture consists of ingredients of unknown acute dermal toxicity.  
 5% of the mixture consists of ingredients of unknown acute inhalation toxicity.

### SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
phenol-formaldehyde polymer	9003-35-4	45 - 60 Trade Secret *
acrylonitrile-butadiene polymer	9003-18-3	35 - 45
rapeseed oil, sulfurized	68153-37-7	1 - 5
zinc oxide	1314-13-2	< 2.45
amorphous silica	7631-86-9	<= 2
phenol	108-95-2	<= 2 Trade Secret *
2-mercaptobenzthiazole	149-30-4	<= 0.5 Trade Secret *
trimethyldihydroquinoline polymer	26780-96-1	<= 0.5

\*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

Allergic skin reaction (redness, swelling, blistering, and itching). Target organ effects. See Section 11 for additional details. Target organ effects following prolonged or repeated exposure. See Section 11 for additional details.

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

Not applicable

### SECTION 5: Fire-fighting measures

#### 5.1. Suitable extinguishing media

In case of fire: Use a fire fighting agent suitable for ordinary combustible material such as water or foam to extinguish.

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

None inherent in this product.

#### Hazardous Decomposition or By-Products

##### Substance

Carbon monoxide

##### Condition

During Combustion

Carbon dioxide  
 Oxides of Nitrogen  
 Oxides of Sulfur

During Combustion  
 During Combustion  
 During Combustion

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

Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

## 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 in accordance with applicable local/regional/national/international regulations.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

For industrial/occupational use only. Not for consumer sale or use. Do not handle until all safety precautions have been read and understood. Do not breathe 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. Use personal protective equipment (gloves, respirators, etc.) as required.

### 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.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
phenol	108-95-2	ACGIH	TWA:5 ppm	A4: Not class. as human carcin, Danger of cutaneous absorption
phenol	108-95-2	OSHA	TWA:19 mg/m3(5 ppm)	SKIN
zinc oxide	1314-13-2	ACGIH	TWA(respirable fraction):2 mg/m3;STEL(respirable fraction):10 mg/m3	
zinc oxide	1314-13-2	OSHA	TWA(as total dust):15 mg/m3;TWA(respirable fraction):5 mg/m3;TWA(as fume):5 mg/m3	
2-mercaptobenzthiazole	149-30-4	AIHA	TWA:5 mg/m3	SKIN; Dermal sensitizer

DUST, INERT OR NUISANCE	7631-86-9	OSHA	TWA(as total dust):15 mg/m <sup>3</sup> ;TWA(as total dust):50 millions of particles/cu. ft.(15 mg/m <sup>3</sup> );TWA(respirable fraction):5 mg/m <sup>3</sup> ;TWA(respirable fraction):15 millions of particles/cu. ft.(5 mg/m <sup>3</sup> )	
Particles (insoluble or poorly soluble) not otherwise specified, inhalable particles	7631-86-9	ACGIH	TWA(inhalable particulates):10 mg/m <sup>3</sup>	
Particles (insoluble or poorly soluble) not otherwise specified, respirable particles	7631-86-9	ACGIH	TWA(respirable particles):3 mg/m <sup>3</sup>	

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:

Safety Glasses with side shields

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. Note: Nitrile gloves may be worn over polymer laminate gloves to improve dexterity.

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

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 - polymer laminate

#### 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

#### Appearance

Physical state

Solid

Color

Colorless

Specific Physical Form:

Film

Odor

Slight Phenolic

Odor threshold

*Not Applicable*

pH

*Not Applicable*

Melting point

*No Data Available*

Boiling Point

*Not Applicable*

Flash Point

$\geq 201$  °F [*Details:CONDITIONS: None*]

Evaporation rate

*Not Applicable*

Flammability (solid, gas)

Not Classified

Flammable Limits(LEL)

*Not Applicable*

Flammable Limits(UEL)

*Not Applicable*

Vapor Pressure

*Not Applicable*

Vapor Density

*Not Applicable*

Specific Gravity

Approximately 1.1 [*Ref Std:WATER=1*]

Solubility in Water

Nil

Solubility- non-water

*Not Applicable*

Partition coefficient: n-octanol/ water

*No Data Available*

Autoignition temperature

*No Data Available*

Decomposition temperature

*Not Applicable*

Viscosity

*Not Applicable*

Hazardous Air Pollutants

*Not Applicable*

Molecular weight

*No Data Available*

Volatile Organic Compounds

*No Data Available*

Percent volatile

*Not Applicable*

VOC Less H<sub>2</sub>O & Exempt Solvents

*No Data Available*

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

This material is considered to be non reactive under normal use conditions.

### 10.2. Chemical stability

Stable.

### 10.3. Possibility of hazardous reactions

Hazardous polymerization will not occur.

### 10.4. Conditions to avoid

None known.

### 10.5. Incompatible materials

None known.

### 10.6. Hazardous decomposition products

#### Substance

#### Condition

None known.

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.

May cause additional health effects (see below).

##### Skin Contact:

Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, dryness, cracking, blistering, and pain.  
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:

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

May cause additional health effects (see below).

#### Additional Health Effects:

##### Single exposure may cause target organ effects:

Cardiac Effects: Signs/symptoms may include irregular heartbeat (arrhythmia), changes in heart rate, damage to heart muscle, heart attack, and may be fatal.

Hematopoietic Effects: Signs/symptoms may include generalized weakness, fatigue and alterations in numbers of circulating blood cells.

Neurological Effects: Signs/symptoms may include personality changes, lack of coordination, sensory loss, tingling or numbness of the extremities, weakness, tremors, and/or changes in blood pressure and heart rate.

Respiratory Effects: Signs/symptoms may include cough, shortness of breath, chest tightness, wheezing, increased heart rate, bluish colored skin (cyanosis), sputum production, changes in lung function tests, and/or respiratory failure.

Kidney/Bladder Effects: Signs/symptoms may include changes in urine production, abdominal or lower back pain, increased protein in urine, increased blood urea nitrogen (BUN), blood in urine, and painful urination.

##### Prolonged or repeated exposure may cause target organ effects:

Cardiac Effects: Signs/symptoms may include irregular heartbeat (arrhythmia), changes in heart rate, damage to heart muscle, heart attack, and may be fatal.

**Hematopoietic Effects:** Signs/symptoms may include generalized weakness, fatigue and alterations in numbers of circulating blood cells.

**Liver Effects:** Signs/symptoms may include loss of appetite, weight loss, fatigue, weakness, abdominal tenderness and jaundice.

**Neurological Effects:** Signs/symptoms may include personality changes, lack of coordination, sensory loss, tingling or numbness of the extremities, weakness, tremors, and/or changes in blood pressure and heart rate.

**Respiratory Effects:** Signs/symptoms may include cough, shortness of breath, chest tightness, wheezing, increased heart rate, bluish colored skin (cyanosis), sputum production, changes in lung function tests, and/or respiratory failure.

**Kidney/Bladder Effects:** Signs/symptoms may include changes in urine production, abdominal or lower back pain, increased protein in urine, increased blood urea nitrogen (BUN), blood in urine, and painful urination.

### Carcinogenicity:

Contains a chemical or chemicals which can cause cancer.

Ingredient	CAS No.	Class Description	Regulation
2-Mercaptobenzothiazole	149-30-4	Grp. 2A: Probable human carc.	International Agency for Research on Cancer

### 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	Dermal		No data available; calculated ATE >5,000 mg/kg
Overall product	Inhalation-Vapor(4 hr)		No data available; calculated ATE >50 mg/l
Overall product	Ingestion		No data available; calculated ATE >5,000 mg/kg
phenol-formaldehyde polymer	Dermal	Rat	LD50 > 2,000 mg/kg
phenol-formaldehyde polymer	Ingestion	Rat	LD50 > 2,900 mg/kg
acrylonitrile-butadiene polymer	Dermal	Rabbit	LD50 > 15,000 mg/kg
acrylonitrile-butadiene polymer	Ingestion	Rat	LD50 > 30,000 mg/kg
zinc oxide	Dermal		LD50 estimated to be > 5,000 mg/kg
zinc oxide	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 5.7 mg/l
zinc oxide	Ingestion	Rat	LD50 > 5,000 mg/kg
amorphous silica	Dermal	Rabbit	LD50 > 5,000 mg/kg
amorphous silica	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 0.691 mg/l
amorphous silica	Ingestion	Rat	LD50 > 5,110 mg/kg
phenol	Inhalation-Vapor		LC50 estimated to be 2 - 10 mg/l
phenol	Dermal	Rat	LD50 670 mg/kg
phenol	Ingestion	Rat	LD50 340 mg/kg
2-mercaptobenzthiazole	Dermal	Rabbit	LD50 > 7,940 mg/kg
2-mercaptobenzthiazole	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 1.27 mg/l
2-mercaptobenzthiazole	Ingestion	Rat	LD50 2,830 mg/kg
trimethyldihydroquinoline polymer	Dermal	Rabbit	LD50 > 5,010 mg/kg
trimethyldihydroquinoline polymer	Ingestion	Rat	LD50 3,190 mg/kg

ATE = acute toxicity estimate

#### Skin Corrosion/Irritation



Name	Species	Value
phenol-formaldehyde polymer	Human and animal	Mild irritant
acrylonitrile-butadiene polymer	Professional judgement	No significant irritation
zinc oxide	Human and animal	No significant irritation
amorphous silica	Rabbit	No significant irritation
phenol	Rat	Corrosive
2-mercaptobenzthiazole	Rabbit	No significant irritation
trimethyldihydroquinoline polymer	Rabbit	No significant irritation

### Serious Eye Damage/Irritation

Name	Species	Value
phenol-formaldehyde polymer	Human and animal	Moderate irritant
acrylonitrile-butadiene polymer	Professional judgement	No significant irritation
zinc oxide	Rabbit	Mild irritant
amorphous silica	Rabbit	No significant irritation
phenol	Rabbit	Corrosive
2-mercaptobenzthiazole	Rabbit	Mild irritant
trimethyldihydroquinoline polymer	Rabbit	No significant irritation

### Skin Sensitization

Name	Species	Value
phenol-formaldehyde polymer	Human and animal	Sensitizing
zinc oxide	Guinea pig	Not classified
amorphous silica	Human and animal	Not classified
phenol	Guinea pig	Not classified
2-mercaptobenzthiazole	Human and animal	Sensitizing
trimethyldihydroquinoline polymer	Guinea pig	Not classified

### Respiratory Sensitization

Name	Species	Value
phenol-formaldehyde polymer	Human	Not classified

### Germ Cell Mutagenicity

Name	Route	Value
zinc oxide	In Vitro	Some positive data exist, but the data are not sufficient for classification
zinc oxide	In vivo	Some positive data exist, but the data are not sufficient for classification

amorphous silica	In Vitro	Not mutagenic
phenol	In Vitro	Some positive data exist, but the data are not sufficient for classification
phenol	In vivo	Some positive data exist, but the data are not sufficient for classification
2-mercaptobenzthiazole	In vivo	Not mutagenic
2-mercaptobenzthiazole	In Vitro	Some positive data exist, but the data are not sufficient for classification
trimethyldihydroquinoline polymer	In Vitro	Not mutagenic

### Carcinogenicity

Name	Route	Species	Value
amorphous silica	Not Specified	Mouse	Some positive data exist, but the data are not sufficient for classification
phenol	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification
phenol	Ingestion	Rat	Some positive data exist, but the data are not sufficient for classification
2-mercaptobenzthiazole	Inhalation	Human	Carcinogenic
2-mercaptobenzthiazole	Ingestion	Multiple animal species	Carcinogenic
trimethyldihydroquinoline polymer	Ingestion	Rat	Some positive data exist, but the data are not sufficient for classification

### Reproductive Toxicity

#### Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
zinc oxide	Ingestion	Not classified for reproduction and/or development	Multiple animal species	NOAEL 125 mg/kg/day	premating & during gestation
amorphous silica	Ingestion	Not classified for female reproduction	Rat	NOAEL 509 mg/kg/day	1 generation
amorphous silica	Ingestion	Not classified for male reproduction	Rat	NOAEL 497 mg/kg/day	1 generation
amorphous silica	Ingestion	Not classified for development	Rat	NOAEL 1,350 mg/kg/day	during organogenesis
phenol	Ingestion	Not classified for female reproduction	Rat	NOAEL 321 mg/kg/day	2 generation
phenol	Ingestion	Not classified for male reproduction	Rat	NOAEL 321 mg/kg/day	2 generation
phenol	Ingestion	Not classified for development	Rat	NOAEL 120 mg/kg/day	during organogenesis
2-mercaptobenzthiazole	Ingestion	Not classified for female reproduction	Rat	NOAEL 745 mg/kg/day	2 generation
2-mercaptobenzthiazole	Ingestion	Not classified for male reproduction	Rat	NOAEL 788 mg/kg/day	2 generation
2-mercaptobenzthiazole	Ingestion	Not classified for development	Rabbit	NOAEL 300 mg/kg/day	during organogenesis
trimethyldihydroquinoline polymer	Ingestion	Not classified for development	Rat	NOAEL 120 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
phenol-formaldehyde	Inhalation	respiratory irritation	Some positive data exist, but the	Human	NOAEL Not	

polymer			data are not sufficient for classification	and animal	available	
phenol	Dermal	hematopoietic system	Causes damage to organs	Rat	LOAEL 108 mg/kg	not available
phenol	Dermal	heart   nervous system   kidney and/or bladder	Causes damage to organs	Rat	LOAEL 107 mg/kg	24 hours
phenol	Dermal	liver	Not classified	Human	NOAEL Not available	not available
phenol	Inhalation	respiratory irritation	May cause respiratory irritation	Multiple animal species	NOAEL Not available	not available
phenol	Ingestion	kidney and/or bladder	Causes damage to organs	Rat	NOAEL 120 mg/kg/day	not applicable
phenol	Ingestion	respiratory system	Causes damage to organs	Human	NOAEL not available	poisoning and/or abuse
phenol	Ingestion	endocrine system   liver	Not classified	Rat	NOAEL 224 mg/kg	not applicable
phenol	Ingestion	heart	Not classified	Human	NOAEL Not available	poisoning and/or abuse

### Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
phenol-formaldehyde polymer	Inhalation	respiratory system	Some positive data exist, but the data are not sufficient for classification	Human	NOAEL Not available	occupational exposure
zinc oxide	Ingestion	nervous system	Not classified	Rat	NOAEL 600 mg/kg/day	10 days
zinc oxide	Ingestion	endocrine system   hematopoietic system   kidney and/or bladder	Not classified	Other	NOAEL 500 mg/kg/day	6 months
amorphous silica	Inhalation	respiratory system   silicosis	Not classified	Human	NOAEL Not available	occupational exposure
phenol	Dermal	nervous system	May cause damage to organs though prolonged or repeated exposure	Rabbit	LOAEL 260 mg/kg/day	18 days
phenol	Inhalation	heart   liver   kidney and/or bladder   respiratory system	Causes damage to organs through prolonged or repeated exposure	Guinea pig	LOAEL 0.1 mg/l	41 days
phenol	Inhalation	nervous system	May cause damage to organs though prolonged or repeated exposure	Multiple animal species	LOAEL 0.1 mg/l	14 days
phenol	Inhalation	hematopoietic system	Not classified	Human	NOAEL Not available	occupational exposure
phenol	Inhalation	immune system	Not classified	Rat	NOAEL 0.1 mg/l	2 weeks
phenol	Ingestion	kidney and/or bladder	Causes damage to organs through prolonged or repeated exposure	Rat	NOAEL 12 mg/kg/day	14 days
phenol	Ingestion	hematopoietic system	Causes damage to organs through prolonged or repeated exposure	Mouse	LOAEL 1.8 mg/kg/day	28 days
phenol	Ingestion	nervous system	May cause damage to organs though prolonged or repeated exposure	Rat	LOAEL 308 mg/kg/day	13 weeks
phenol	Ingestion	liver	Not classified	Rat	NOAEL 40 mg/kg/day	14 days
phenol	Ingestion	respiratory system	Not classified	Rat	LOAEL 40 mg/kg/day	14 days
phenol	Ingestion	immune system	Not classified	Mouse	NOAEL 1.8 mg/kg/day	28 days
phenol	Ingestion	endocrine system	Not classified	Rat	NOAEL 120 mg/kg/day	14 days
phenol	Ingestion	skin   bone, teeth, nails, and/or hair	Not classified	Multiple animal species	NOAEL 1,204 mg/kg/day	103 weeks

2-mercaptobenzthiazole	Ingestion	gastrointestinal tract   kidney and/or bladder   heart   endocrine system   bone, teeth, nails, and/or hair   hematopoietic system   liver   immune system   nervous system   eyes   respiratory system	Not classified	Rat	NOAEL 375 mg/kg/day	2 years
trimethyldihydroquinoline polymer	Ingestion	endocrine system   liver   heart   skin   gastrointestinal tract   bone, teeth, nails, and/or hair   hematopoietic system   immune system   muscles   nervous system   eyes   kidney and/or bladder   respiratory system   vascular system	Not classified	Rat	NOAEL 48 mg/kg/day	2 years

**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 waste product in a permitted industrial waste facility. As a disposal alternative, incinerate 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.

**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.

**EPCRA 311/312 Hazard Classifications:****Physical Hazards**

Not applicable

**Health Hazards**

Carcinogenicity

Respiratory or Skin Sensitization

Serious eye damage or eye irritation

Skin Corrosion or Irritation

Specific target organ toxicity (single or repeated exposure)

**Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):**

<b>Ingredient</b>	<b>C.A.S. No</b>	<b>% by Wt</b>
zinc oxide (ZINC COMPOUNDS)	1314-13-2	< 2.45
phenol	108-95-2	Trade Secret <= 2
2-mercaptobenzthiazole	149-30-4	Trade Secret <= 0.5

**15.2. State Regulations**

Contact 3M for more information.

**15.3. Chemical Inventories**

This product is an article as defined by TSCA regulations, and is exempt from TSCA Inventory listing requirements.

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: 1 Instability: 0 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.

<b>Document Group:</b>	10-8380-7	<b>Version Number:</b>	40.00
<b>Issue Date:</b>	03/15/23	<b>Supersedes Date:</b>	09/15/20

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