



Safety Data Sheet

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SECTION 1: Identification

1.1. Product identifier

3M™ Anisotropic Conductive Film TP6371-20

Product Identification Numbers

70-0064-6079-7

1.2. Recommended use and restrictions on use

Recommended use

ACF adhesive, Adhesive

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Electronics Materials Solutions Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	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

Skin Sensitizer: Category 1B.

Specific Target Organ Toxicity (repeated exposure): Category 2.

2.2. Label elements

Signal word

Warning

Symbols

Exclamation mark | Health Hazard |

Pictograms

**Hazard Statements**

May cause an allergic skin reaction.

May cause damage to organs through prolonged or repeated exposure:
respiratory system |

Precautionary Statements**Prevention:**

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

Wear protective gloves.

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

Response:

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.

Get medical advice/attention if you feel unwell.

Disposal:

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

2.3. Hazards not otherwise classified

None.

44% of the mixture consists of ingredients of unknown acute oral toxicity.

66% of the mixture consists of ingredients of unknown acute dermal toxicity.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
oligomeric bismaleimide	None	13 - 17
dicyclopentylidimethylene diacrylate	42594-17-2	10 - 15 Trade Secret *
styrene-butadiene-styrene polymer	Trade Secret*	9 - 12.5
polybutadiene dimethacrylate	None	5 - 8.5
benzene, (1-methylethyl)-, telomer with ethylbenzene and 2,5-furandione	26762-29-8	5 - 8.5
terpene phenolic resin	68083-03-4	5 - 8.5
benzoyl peroxide	94-36-0	2 - 6.5 Trade Secret *
synthetic amorphous silica, fumed, crystalline free	112945-52-5	1 - 5.5
methacrylic polymer	25777-71-3	1 - 5.5
nickel	7440-02-0	0.5 - 5 Trade Secret *
modified phosphoric acid ester	None	0.5 - 4.5
methacryloxypropyltrimethoxysilane	2530-85-0	0.1 - 3.5 Trade Secret *
gold	7440-57-5	0.4

*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:

Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms persist, 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

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
Carbon dioxide

Condition

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

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 skin contact with hot material. For industrial or professional use only. 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.

7.2. Conditions for safe storage including any incompatibilities

Store away from heat.

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
SILICA, AMORPHOUS	112945-52-5	OSHA	TWA concentration:0.8 mg/m ³ ;TWA:20 millions of particles/cu. ft.	
nickel	7440-02-0	ACGIH	TWA(inhalable fraction):1.5 mg/m ³	A5: Not suspected human carcin
nickel	7440-02-0	OSHA	TWA(as Ni):1 mg/m ³	
benzoyl peroxide	94-36-0	ACGIH	TWA:5 mg/m ³	A4: Not class. as human carcin
benzoyl peroxide	94-36-0	OSHA	TWA:5 mg/m ³	

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

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

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 - 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.

Thermal hazards

Wear heat insulating gloves when handling hot material to prevent thermal burns.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Solid
Specific Physical Form:	Film
Odor, Color, Grade:	Minimal to no odor; clear
Odor threshold	<i>Not Applicable</i>
pH	<i>Not Applicable</i>
Melting point	<i>Not Applicable</i>
Boiling Point	<i>Not Applicable</i>
Flash Point	Flash point > 93 °C (200 °F)
Evaporation rate	<i>No Data Available</i>
Flammability (solid, gas)	Not Classified
Flammable Limits(LEL)	<i>Not Applicable</i>
Flammable Limits(UEL)	<i>Not Applicable</i>
Vapor Pressure	<i>Not Applicable</i>
Vapor Density	<i>Not Applicable</i>
Density	1 g/cm ³
Specific Gravity	1 [<i>Ref Std: WATER=1</i>]
Solubility in Water	<i>Not Applicable</i>
Solubility- non-water	<i>Not Applicable</i>
Partition coefficient: n-octanol/ water	<i>No Data Available</i>
Autoignition temperature	<i>No Data Available</i>
Decomposition temperature	<i>Not Applicable</i>
Viscosity	<i>Not Applicable</i>
Percent volatile	Negligible

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 will not occur.

10.4. Conditions to avoid

Heat

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:

May cause additional health effects (see below).

Skin Contact:

Contact with the skin during product use is not expected to result in significant irritation. Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Eye Contact:

Contact with the eyes during product use is not expected to result in significant irritation.

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.

Additional Health Effects:

Prolonged or repeated exposure may cause target organ effects:

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.

Carcinogenicity:

<u>Ingredient</u>	<u>CAS No.</u>	<u>Class Description</u>	<u>Regulation</u>
NICKEL COMPOUNDS	7440-02-0	Grp. 1: Carcinogenic to humans	International Agency for Research on Cancer
nickel	7440-02-0	Grp. 2B: Possible human carc.	International Agency for Research on Cancer

nickel	7440-02-0	Anticipated human carcinogen	National Toxicology Program Carcinogens
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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	Ingestion		No data available; calculated ATE > 5,000 mg/kg
dicyclopentylidimethylene diacrylate	Dermal	Professional judgment	LD50 estimated to be > 5,000 mg/kg
dicyclopentylidimethylene diacrylate	Ingestion	Rat	LD50 15,400 mg/kg
benzene, (1-methylethyl)-, telomer with ethylbenzene and 2,5-furandione	Ingestion		LD50 estimated to be 2,000 - 5,000 mg/kg
terpene phenolic resin	Ingestion		LD50 estimated to be 2,000 - 5,000 mg/kg
benzoyl peroxide	Dermal		LD50 estimated to be 2,000 - 5,000 mg/kg
benzoyl peroxide	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 24.3 mg/l
benzoyl peroxide	Ingestion	Rat	LD50 > 5,000 mg/kg
methacrylic polymer	Ingestion		LD50 estimated to be 2,000 - 5,000 mg/kg
synthetic amorphous silica, fumed, crystalline free	Dermal	Rabbit	LD50 > 5,000 mg/kg
synthetic amorphous silica, fumed, crystalline free	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 0.691 mg/l
synthetic amorphous silica, fumed, crystalline free	Ingestion	Rat	LD50 > 5,110 mg/kg
nickel	Dermal		LD50 estimated to be > 5,000 mg/kg
nickel	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 2.55 mg/l
nickel	Ingestion	Rat	LD50 > 9,000 mg/kg
methacryloxypropyltrimethoxysilane	Dermal	Rabbit	LD50 > 20,900 mg/kg
methacryloxypropyltrimethoxysilane	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 2.28 mg/l
methacryloxypropyltrimethoxysilane	Ingestion	Rat	LD50 > 5,225 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
dicyclopentylidimethylene diacrylate	Rabbit	No significant irritation
benzoyl peroxide	Rabbit	Minimal irritation
methacrylic polymer	Professional judgment	Minimal irritation
synthetic amorphous silica, fumed, crystalline free	Rabbit	No significant irritation
nickel	Rabbit	Minimal irritation
methacryloxypropyltrimethoxysilane	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
dicyclopentylidimethylene diacrylate	Rabbit	Mild irritant
benzoyl peroxide	Rabbit	Severe irritant
methacrylic polymer	Professional judgment	Mild irritant
synthetic amorphous silica, fumed, crystalline free	Rabbit	No significant irritation
nickel	Rabbit	Mild irritant

methacryloxypropyltrimethoxysilane	Rabbit	Mild irritant
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Skin Sensitization

Name	Species	Value
dicyclopentylidimethylene diacrylate	Guinea pig	Sensitizing
benzoyl peroxide	Human and animal	Sensitizing
synthetic amorphous silica, fumed, crystalline free	Human and animal	Not sensitizing
nickel	Human	Sensitizing
methacryloxypropyltrimethoxysilane	Guinea pig	Not sensitizing

Respiratory Sensitization

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

Germ Cell Mutagenicity

Name	Route	Value
dicyclopentylidimethylene diacrylate	In Vitro	Not mutagenic
benzoyl peroxide	In Vitro	Not mutagenic
benzoyl peroxide	In vivo	Not mutagenic
synthetic amorphous silica, fumed, crystalline free	In Vitro	Not mutagenic
methacryloxypropyltrimethoxysilane	In Vitro	Not mutagenic
methacryloxypropyltrimethoxysilane	In vivo	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
benzoyl peroxide	Ingestion	Multiple animal species	Not carcinogenic
benzoyl peroxide	Dermal	Mouse	Some positive data exist, but the data are not sufficient for classification
synthetic amorphous silica, fumed, crystalline free	Not Specified	Mouse	Some positive data exist, but the data are not sufficient for classification
nickel	Inhalation	similar compounds	Carcinogenic

Reproductive Toxicity

Reproductive and/or Developmental Effects

Name	Route	Value	Species	Test Result	Exposure Duration
benzoyl peroxide	Ingestion	Not toxic to female reproduction	Rat	NOAEL 1,000 mg/kg/day	prematuring & during gestation
benzoyl peroxide	Ingestion	Some positive male reproductive data exist, but the data are not sufficient for classification	Rat	NOAEL 500 mg/kg/day	prematuring & during gestation
benzoyl peroxide	Ingestion	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 500 mg/kg/day	prematuring & during gestation
synthetic amorphous silica, fumed, crystalline free	Ingestion	Not toxic to female reproduction	Rat	NOAEL 509 mg/kg/day	1 generation
synthetic amorphous silica, fumed, crystalline free	Ingestion	Not toxic to male reproduction	Rat	NOAEL 497 mg/kg/day	1 generation
synthetic amorphous silica, fumed, crystalline free	Ingestion	Not toxic to development	Rat	NOAEL 1,350 mg/kg/day	during organogenesis
methacryloxypropyltrimethoxysilane	Ingestion	Some positive developmental data exist, but the data are not sufficient for	Rat	NOAEL 5,200	during organogenesis

		classification		mg/kg/day	s
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Target Organ(s)**Specific Target Organ Toxicity - single exposure**

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

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
synthetic amorphous silica, fumed, crystalline free	Inhalation	respiratory system silicosis	All data are negative	Human	NOAEL Not available	occupational exposure
nickel	Inhalation	respiratory system	Causes damage to organs through prolonged or repeated exposure	Rat	LOAEL 0.001 mg/l	13 weeks
methacryloxypropyltrimethoxysilane	Dermal	skin	Some positive data exist, but the data are not sufficient for classification	Rabbit	NOAEL 2,100 mg/kg/day	17 days
methacryloxypropyltrimethoxysilane	Dermal	liver kidney and/or bladder	All data are negative	Rabbit	NOAEL 2,100 mg/kg/day	17 days
methacryloxypropyltrimethoxysilane	Inhalation	respiratory system	May cause damage to organs though prolonged or repeated exposure	Rat	LOAEL 0.05 mg/l	14 weeks
methacryloxypropyltrimethoxysilane	Inhalation	liver	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 0.244 mg/l	14 weeks
methacryloxypropyltrimethoxysilane	Inhalation	hematopoietic system eyes kidney and/or bladder	All data are negative	Rat	NOAEL 0.244 mg/l	14 weeks

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.

EPA Hazardous Waste Number (RCRA): Not regulated

SECTION 14: Transport Information

Not regulated per U.S. DOT, IATA or IMO.

*These transportation classifications are provided as a customer service. As the shipper YOU remain responsible for complying with all applicable laws and regulations, including proper transportation classification and packaging. 3M transportation classifications are based on product formulation, packaging, 3M policies and 3M understanding of applicable current regulations. 3M does not guarantee the accuracy of this classification information. This information applies only to transportation classification and **not the packaging, labeling, or marking requirements**. The original 3M package is certified for U.S. ground shipment only. If you are shipping by air or ocean, the package may not meet applicable regulatory requirements.*

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 - Yes

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

<u>Ingredient</u>	<u>C.A.S. No</u>	<u>% by Wt</u>
benzoyl peroxide	94-36-0	2 - 6.5
nickel	7440-02-0	0.5 - 5
nickel (Nickel)	7440-02-0	0.5 - 5
nickel (NICKEL COMPOUNDS)	7440-02-0	0.5 - 5

15.2. State Regulations

Contact 3M for more information.

15.3. Chemical Inventories

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

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.

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