Safety Data Sheet

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SECTION 1: Identification

1.1. Product identifier
3M™Anisotropic Conductive Film 7376-30

Product Identification Numbers
70-0003-3630-8, 70-0064-5776-9, 70-0064-5777-7, 70-0064-5778-5, 70-0064-5779-3, 70-0064-5812-2, 70-0064-5813-0, 70-0064-5814-8, 70-0064-5815-5, 70-0064-5850-2, 70-0064-5851-0

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.

21% of the mixture consists of ingredients of unknown acute oral toxicity.
49% of the mixture consists of ingredients of unknown acute dermal toxicity.
73% of the mixture consists of ingredients of unknown acute inhalation toxicity.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
oligomeric bismaleimide	None	12 - 16.5 Trade Secret *
styrene-butadiene-styrene polymer	Trade Secret*	10 - 15
dicyclopentyldimethylene diacrylate	42594-17-2	10 - 15 Trade Secret *
methacrylic polymer	25777-71-3	7 - 13.5 Trade Secret *
polybutadiene dimethacrylate	None	4 - 9
benzoyl peroxide	94-36-0	2.5 - 7.5 Trade Secret *
nickel	7440-02-0	1 - 6 Trade Secret *
fumed silica	112945-52-5	1 - 6 Trade Secret *
modified phosphoric acid ester	None	0.5 - 5
gold	7440-57-5	0 - 5
methacryloxypropyltrimethoxysilane	2530-85-0	0.5 - 4.5 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:
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	Condition
Carbon monoxide	During Combustion
Carbon dioxide	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. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Warning! A motor could be an ignition source and could cause flammable gases or vapors in the spill area to burn or explode. 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/m3;TWA:20 millions of particles/cu. ft.	
nickel	7440-02-0	OSHA	TWA(as Ni):1 mg/m3	
nickel	7440-02-0	ACGIH	TWA(inhalable fraction):1.5 mg/m3	A5: Not suspected human carcin
benzoyl peroxide	94-36-0	OSHA	TWA:5 mg/m3	
benzoyl peroxide	94-36-0	ACGIH	TWA:5 mg/m3	A4: Not class. as 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:
Safety Glasses with side shields

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: 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 color
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point	*Not Applicable*
Boiling Point	*Not Applicable*
Flash Point	No flash point
Evaporation rate	*No Data Available*
Flammability (solid, gas)	Not Classified
Flammable Limits(LEL)	*Not Applicable*
Flammable Limits(UEL)	*Not Applicable*
Vapor Pressure	*Not Applicable*
Vapor Density	*Not Applicable*
Density	1 g/cm3
Specific Gravity	1 [*Ref Std:* WATER=1]
Solubility in Water	*Not Applicable*
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*No Data Available*
Decomposition temperature	*No Data Available*
Viscosity	*Not Applicable*
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	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:
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:

Ingredient	CAS No.	Class Description	Regulation
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

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-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
dicyclopentyldimethylene diacrylate	Dermal	Professional judgement	LD50 estimated to be > 5,000 mg/kg
dicyclopentyldimethylene diacrylate	Ingestion	Rat	LD50 15,400 mg/kg
methacrylic polymer	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
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
fumed silica	Dermal	Rabbit	LD50 > 5,000 mg/kg
fumed silica	Inhalation-Dust/Mist (4 hours)	Rat	LC50 > 0.691 mg/l
fumed silica	Ingestion	Rat	LD50 > 5,110 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
dicyclopentyldimethylene diacrylate	Rabbit	No significant irritation
methacrylic polymer	Professional judgement	Minimal irritation
benzoyl peroxide	Rabbit	Minimal irritation
nickel	Rabbit	Minimal irritation
fumed silica	Rabbit	No significant irritation
methacryloxypropyltrimethoxysilane	Rabbit	No significant irritation

Serious Eye Damage/Irritation

Name	Species	Value
dicyclopentyldimethylene diacrylate	Rabbit	Mild irritant
methacrylic polymer	Professional judgement	Mild irritant

benzoyl peroxide	Rabbit	Severe irritant
nickel	Rabbit	Mild irritant
fumed silica	Rabbit	No significant irritation
methacryloxypropyltrimethoxysilane	Rabbit	Mild irritant

Skin Sensitization

Name	Species	Value
dicyclopentyldimethylene diacrylate	Guinea pig	Sensitizing
benzoyl peroxide	Human and animal	Sensitizing
nickel	Human	Sensitizing
fumed silica	Human and animal	Not 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
dicyclopentyldimethylene diacrylate	In Vitro	Not mutagenic
benzoyl peroxide	In Vitro	Not mutagenic
benzoyl peroxide	In vivo	Not mutagenic
fumed silica	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
nickel	Inhalation	similar compounds	Carcinogenic
fumed silica	Not Specified	Mouse	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
benzoyl peroxide	Ingestion	Not toxic to female reproduction	Rat	NOAEL 1,000 mg/kg/day	premating & 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	premating & during gestation
benzoyl peroxide	Ingestion	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 500 mg/kg/day	premating & during gestation
fumed silica	Ingestion	Not toxic to female reproduction	Rat	NOAEL 509 mg/kg/day	1 generation
fumed silica	Ingestion	Not toxic to male reproduction	Rat	NOAEL 497 mg/kg/day	1 generation
fumed silica	Ingestion	Not toxic to development	Rat	NOAEL 1,350	during organogenesi

				mg/kg/day	s
methacryloxypropyltrimethoxysilane	Ingestion	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 5,200 mg/kg/day	during organogenesis

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
nickel	Inhalation	respiratory system	Causes damage to organs through prolonged or repeated exposure	Rat	LOAEL 0.001 mg/l	13 weeks
fumed silica	Inhalation	respiratory system | silicosis	All data are negative	Human	NOAEL Not available	occupational exposure
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.

Incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. As a disposal alternative, utilize an acceptable permitted waste disposal facility. 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

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):

Ingredient	C.A.S. No	% by Wt
benzoyl peroxide	94-36-0	2.5 - 7.5
nickel (NICKEL COMPOUNDS)	7440-02-0	1 - 6
nickel	7440-02-0	1 - 6

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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