Safety Data Sheet

Document Group:	11-3307-3	**Version Number:**	56.00
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SECTION 1: Identification

1.1. Product identifier
3M™ Scotch-Weld™ Structural Adhesive Film AF 191

Product Identification Numbers
LA-T100-2677-4, 62-0199-5305-8, 62-0199-5306-6, 62-0199-5309-0, 62-2608-5301-5, 62-2608-5305-6, 62-2608-5309-8, 62-2638-5301-2, 62-2638-5309-5, 62-2707-5306-4, 62-2707-5309-8, 62-3053-2005-3, 62-3053-5305-4, 62-3053-5306-2, 62-3053-5309-6, 62-3068-3905-1, 62-3068-4105-7, 62-3068-4905-0, 62-3068-5505-7, 62-3068-6005-7, 62-3068-6006-5, 62-3068-6008-1, 62-3072-2500-3, 62-3072-3905-3, 62-3072-4505-0, 62-3072-5305-4, 62-3072-5306-2, 62-3072-5307-0, 62-3072-5309-6, 62-3072-5338-5, 62-3142-3505-2, 62-3142-3705-8, 62-3142-3906-2, 62-3142-5304-8, 62-3142-5305-5, 62-3142-5306-3, 62-3142-5307-1, 62-3142-5308-9, 62-3142-5309-7, 62-3142-6005-0, 62-3142-6038-1, 62-3151-3903-0, 62-3151-5305-6, 62-3151-5306-4, 62-3151-5309-8, 62-3167-3905-1, 62-3172-3906-9, 62-3172-5305-2, 62-3172-5309-4, 62-3329-5305-8, 62-3329-5306-6, 62-3329-5307-4, 62-3329-5308-2, 62-3329-5309-0, 62-3384-5305-3, 62-3384-5308-7, 62-3384-5309-5, 87-2500-0180-4, 87-2500-0216-6, 87-2500-0218-2, 87-3300-0005-7, 87-3300-0010-7, 87-3300-0016-4, 87-3300-0118-8, 87-3300-0159-2, 87-3300-0160-0, 87-3300-0517-1, 87-3300-0518-9, 87-3300-0519-7, 87-3300-0534-6, 87-3300-0535-3, 87-3300-0536-1, 87-3300-0537-9, 87-3300-0538-7, 87-3300-0539-5, 87-3300-0540-3, 87-3300-0541-1, 87-3300-0542-9, 87-3300-0553-6, 87-3300-0554-4, 87-3300-0555-1, 87-3300-0556-9, 87-3300-0557-7, 87-3300-0558-5, 87-3300-0559-3, 87-3300-0560-1, 87-3300-0561-9
7010365910, 7010309712, 7010367247, 7010309739, 7100031513, 7000046379, 7010301043, 7010366083, 7010329577, 7000046411, 7010366089, 7010329578, 7000046413, 7000046414, 7000046421, 7100037736, 7000000838, 7000000839, 7010301047, 7010366108, 7100094499, 7000046412, 7010321060, 7010304392, 7010352083, 7100067277, 7100067204, 7100067203, 7100067282, 7100067916, 7100067305, 7100066651, 7100067307, 7100067308, 7100067309, 7100067330, 7100067334, 7100067409, 7100067346, 7100067421, 7100067420, 7100067097, 7100067089, 7100067088, 7100067087, 7100067086, 7010352100

1.2. Recommended use and restrictions on use

Recommended use
Structural Adhesive Film

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Automotive and Aerospace 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
Acute Toxicity (oral): Category 4.
Reproductive Toxicity: Category 1B.
Reproductive Toxicity: Lactation.
Germ Cell Mutagenicity: Category 2.
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
Harmful if swallowed.
May damage fertility or the unborn child.
May cause harm to breast-fed children.
Suspected of causing genetic defects.

Causes damage to organs:
blood or blood-forming organs |
liver |

Causes damage to organs through prolonged or repeated exposure:
blood or blood-forming organs |
liver |

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.
Avoid contact during pregnancy/while nursing.
Wear protective gloves.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.

Response:
Rinse mouth.
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

IF exposed or concerned: Get medical advice/attention.
Specific treatment (see Notes to Physician on this label).

Storage:
Store locked up.

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

Notes to Physician:
Overexposure to this product may result in methemoglobinemia. Methemoglobinemia may be clinically suspected by the presence of clinical "cyanosis" in the presence of a normal PaO2 (as obtained by arterial blood gases). Routine pulse oximetry may be inaccurate for monitoring oxygen saturation in the presence of methemoglobinemia, and should not be used to make the diagnosis of this disorder. If the patient is symptomatic or if the methemoglobin level is >20%, specific therapy with methylene blue should be considered as part of the medical management.

50% of the mixture consists of ingredients of unknown acute oral toxicity.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
Alkyl/ Diamine/ Phenolic Epoxy reaction product	Trade Secret*	40 - 60
Epoxy Resin B	28768-32-3	20 - 40 Trade Secret *
Epoxy Resin A	63738-22-7	10 - 20 Trade Secret *
p,p'-Diaminodiphenyl Sulfone	80-08-0	< 10 Trade Secret *
Calcium Triflate	358-23-6	<= 0.01

*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:
Wash with soap and water. 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

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
Overexposure to this product may result in methemoglobinemia. Methemoglobinemia may be clinically suspected by the presence of clinical "cyanosis" in the presence of a normal PaO2 (as obtained by arterial blood gases). Routine pulse oximetry may be inaccurate for monitoring oxygen saturation in the presence of methemoglobinemia, and should not be used to make the diagnosis of this disorder. If the patient is symptomatic or if the methemoglobin level is >20%, specific therapy with methylene blue should be considered as part of the

medical management.

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
Exposure to extreme heat can give rise to thermal decomposition.

Hazardous Decomposition or By-Products

Substance	Condition
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Fluoride	During Combustion
Oxides of Nitrogen	During Combustion
Oxides of Sulfur	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. Avoid contact during pregnancy/while nursing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Use personal protective equipment (gloves, respirators, etc.) as required.

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
p,p'-Diaminodiphenyl Sulfone	80-08-0	Manufacturer determined	TWA:0.1 mg/m3	

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
Provide ventilated enclosure for curing. Curing enclosures must be exhausted to outdoors or to a suitable emission control device. For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use with appropriate local exhaust ventilation sufficient to maintain levels of thermal decomposition products below their exposure guidelines. 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: Chemical Protective glove of any material type

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:
For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use a positive pressure supplied-air respirator.
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	White

Specific Physical Form: Film

Odor	Odorless
Odor threshold	*No Data Available*
pH	*Not Applicable*
Melting point	*No Data Available*
Boiling Point	*Not Applicable*
Flash Point	No flash point
Evaporation rate	*Not Applicable*
Flammability (solid, gas)	Not Classified
Flammable Limits(LEL)	*Not Applicable*
Flammable Limits(UEL)	*Not Applicable*
Vapor Pressure	*No Data Available*
Vapor Density	*No Data Available*
Density	1.26 g/cm3
Specific Gravity	*No Data Available*
Solubility in Water	Nil
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*Not Applicable*
Autoignition temperature	*Not Applicable*
Decomposition temperature	*No Data Available*
Viscosity	*Not Applicable*
Molecular weight	*No Data Available*
Percent volatile	<= 1.3 % weight [*Test Method:*Estimated]

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.

Extreme heat arising from situations such as misuse or equipment failure can generate hydrogen fluoride as a decomposition product.

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

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

Ingestion:
Harmful if swallowed. Physical Blockage: Signs/symptoms may include cramping, abdominal pain, and constipation.

May cause additional health effects (see below).

Additional Health Effects:

Single exposure may cause target organ effects:
Methemoglobinemia: Signs/symptoms may include headache, dizziness, nausea, difficulty breathing, and generalized weakness.

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

Blood Effects: Signs/symptoms may include generalized weakness and fatigue, skin pallor, changes in blood clotting time, internal bleeding, and/or hemoglobinemia.

Prolonged or repeated exposure may cause target organ effects:
Liver Effects: Signs/symptoms may include loss of appetite, weight loss, fatigue, weakness, abdominal tenderness and jaundice.

Blood Effects: Signs/symptoms may include generalized weakness and fatigue, skin pallor, changes in blood clotting time, internal bleeding, and/or hemoglobinemia.

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.

Reproductive/Developmental Toxicity:
Contains a chemical or chemicals which can cause birth defects or other reproductive harm. Contains a chemical or chemicals which may interfere with lactation or be harmful to breastfed children.

Genotoxicity:
Genotoxicity and Mutagenicity: May interact with genetic material and possibly alter gene expression.

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	Ingestion		No data available; calculated ATE >300 - =2,000 mg/kg
Epoxy Resin B	Dermal	Rabbit	LD50 > 3,000 mg/kg
Epoxy Resin B	Ingestion	Rat	LD50 > 5,000 mg/kg
Epoxy Resin A	Ingestion	Rat	LD50 630 mg/kg
p,p'-Diaminodiphenyl Sulfone	Ingestion	Professional judgement	LD50 250 mg/kg
p,p'-Diaminodiphenyl Sulfone	Dermal	Rabbit	LD50 > 2,000 mg/kg
Calcium Triflate	Ingestion	Rat	LD50 1,012 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Overall product	Multiple animal species	No significant irritation
Epoxy Resin B	Rabbit	No significant irritation
Epoxy Resin A	Rabbit	Irritant
p,p'-Diaminodiphenyl Sulfone	Rabbit	No significant irritation
Calcium Triflate	Rabbit	Corrosive

Serious Eye Damage/Irritation

Name	Species	Value
Epoxy Resin B	Rabbit	Mild irritant
Epoxy Resin A	In vitro data	No significant irritation
p,p'-Diaminodiphenyl Sulfone	In vitro data	No significant irritation
Calcium Triflate	similar health hazards	Corrosive

Skin Sensitization

Name	Species	Value
Overall product	Guinea pig	Not classified
Epoxy Resin B	Human and animal	Sensitizing
Epoxy Resin A	Professional judgement	Sensitizing
p,p'-Diaminodiphenyl Sulfone	Mouse	Not classified

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
Epoxy Resin B	In Vitro	Some positive data exist, but the data are not sufficient for classification
Epoxy Resin B	In vivo	Mutagenic
Epoxy Resin A	In Vitro	Some positive data exist, but the data are not sufficient for classification

p,p'-Diaminodiphenyl Sulfone	In vivo	Not mutagenic
p,p'-Diaminodiphenyl Sulfone	In Vitro	Some positive data exist, but the data are not sufficient for classification
Calcium Triflate	In Vitro	Not mutagenic

Carcinogenicity

Name	Route	Species	Value
p,p'-Diaminodiphenyl Sulfone	Ingestion	Multiple animal species	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
Epoxy Resin B	Ingestion	Not classified for development	Rat	NOAEL 90 mg/kg/day	during gestation
p,p'-Diaminodiphenyl Sulfone	Ingestion	Not classified for female reproduction	Rat	NOAEL 30 mg/kg/day	2 generation
p,p'-Diaminodiphenyl Sulfone	Ingestion	Not classified for development	Mouse	NOAEL 100 mg/kg/day	during organogenesis
p,p'-Diaminodiphenyl Sulfone	Ingestion	Toxic to male reproduction	Rat	LOAEL 7.5 mg/kg/day	2 generation

Lactation

Name	Route	Species	Value
p,p'-Diaminodiphenyl Sulfone	Ingestion	Human	Causes effects on or via lactation

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Epoxy Resin A	Inhalation	respiratory irritation	Some positive data exist, but the data are not sufficient for classification	similar health hazards	NOAEL Not available	
p,p'-Diaminodiphenyl Sulfone	Ingestion	blood | methemoglobinemia | liver	Causes damage to organs	Human	NOAEL Not available	poisoning and/or abuse
p,p'-Diaminodiphenyl Sulfone	Ingestion	central nervous system depression	Not classified	Human	NOAEL Not available	poisoning and/or abuse
Calcium Triflate	Inhalation	respiratory irritation	May cause respiratory irritation	similar health hazards	NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Epoxy Resin B	Ingestion	hematopoietic system	Some positive data exist, but the data are not sufficient for classification	Rat	NOAEL 50 mg/kg/day	13 weeks
Epoxy Resin B	Ingestion	gastrointestinal tract | liver | immune system | nervous system | eyes | kidney and/or bladder	Not classified	Rat	NOAEL 200 mg/kg/day	13 weeks
p,p'-Diaminodiphenyl Sulfone	Ingestion	blood | liver	Causes damage to organs through prolonged or repeated exposure	Human	NOAEL Not available	not available
p,p'-Diaminodiphenyl	Ingestion	nervous system	May cause damage to organs	Human	NOAEL Not	poisoning

Sulfone			though prolonged or repeated exposure		available	and/or abuse
p,p'-Diaminodiphenyl Sulfone	Ingestion	immune system	Not classified	Mouse	NOAEL 54 mg/kg/day	30 days
p,p'-Diaminodiphenyl Sulfone	Ingestion	heart	Not classified	Human	NOAEL Not available	not available
p,p'-Diaminodiphenyl Sulfone	Ingestion	kidney and/or bladder	Not classified	Human	NOAEL Not available	poisoning and/or abuse
p,p'-Diaminodiphenyl Sulfone	Ingestion	vascular system	Not classified	Human	NOAEL Not available	not available
p,p'-Diaminodiphenyl Sulfone	Ingestion	endocrine system | eyes	Not classified	Rat	NOAEL 100 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. Combustion products will include HF. Facility must be capable of handling halogenated materials. 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
Acute toxicity
Germ cell mutagenicity
Reproductive toxicity
Specific target organ toxicity (single or repeated exposure)

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: 3 **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.

The NFPA Health code of 3 is due to emergency situations where the material may thermally decompose and release Hydrogen Fluoride. During normal use conditions, please reference Section 2 and Section 11 of the SDS for additional health hazard information.

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