



## Material Safety Data Sheet

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**PRODUCT NAME:** 3M(TM) Scotch-Weld(TM) Epoxy Adhesive DP-420, Off-White  
**MANUFACTURER:** 3M  
**DIVISION:** Industrial Adhesives and Tapes Division

**ADDRESS:** 3M Center  
St. Paul, MN 55144-1000

**EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)**

**Issue Date:** 01/31/2007  
**Supersedes Date:** 11/16/2006

**Document Group:** 11-2411-4

### ID Number(s):

62-3280-1430-3, 62-3280-1435-2, 62-3280-3530-8, 62-3280-3830-2

**This product is a kit or a multipart product which consists of multiple, independently packaged components. An MSDS for each of these components is included. Please do not separate the component MSDSs from this cover page. The document numbers of the MSDSs for components of this product are:**

22-0528-4, 11-2409-8

Revision Changes:  
Copyright was modified.  
Kit: Component document group number(s) was modified.

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## Material Safety Data Sheet

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### SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** 3M(TM) Scotch-Weld(TM) Epoxy Adhesive DP-420, Off-White (Part B)

**MANUFACTURER:** 3M

**DIVISION:** Industrial Adhesives and Tapes Division

**ADDRESS:** 3M Center  
St. Paul, MN 55144-1000

**EMERGENCY PHONE:** 1-800-364-3577 or (651) 737-6501 (24 hours)

**Issue Date:** 10/24/2007

**Supercedes Date:** 01/31/2007

**Document Group:** 11-2409-8

#### Product Use:

**Specific Use:** Base for 2-Component Epoxy Adhesive

**Intended Use:** Industrial use

### SECTION 2: INGREDIENTS

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>% by Wt</u>
Epoxy Resin	25068-38-6	85 - 93
Acrylic Polymer - N.J.T.S. Reg No. 04499600-5018P	Trade Secret	7 - 13
Adhesion Promotor	2530-83-8	0.1 - 1
2,6-di-tert-Butyl-p-Cresol	128-37-0	0.1 - 1

### SECTION 3: HAZARDS IDENTIFICATION

#### 3.1 EMERGENCY OVERVIEW

**Specific Physical Form:** Paste

**Odor, Color, Grade:** White, very mild odor.

**General Physical Form:** Liquid

**Immediate health, physical, and environmental hazards:** May cause allergic skin reaction.

#### 3.2 POTENTIAL HEALTH EFFECTS

**Eye Contact:**

Moderate Eye Irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Vapors released during curing may cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Dust created by cutting, grinding, sanding, or machining may cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

**Skin Contact:**

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

Prolonged or repeated exposure may cause:

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

**Inhalation:**

Vapors released during curing may cause irritation of the respiratory system. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Dust from cutting, grinding, sanding or machining may cause irritation of the respiratory system. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

**Ingestion:**

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

## SECTION 4: FIRST AID MEASURES

### 4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

**Eye Contact:** Flush eyes with large amounts of water. If signs/symptoms persist, get medical attention.

**Skin Contact:** Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water. Get medical attention. Wash contaminated clothing and clean shoes before reuse.

**Inhalation:** If signs/symptoms develop, remove person to fresh air. If signs/symptoms persist, get medical attention.

**If Swallowed:** Do not induce vomiting unless instructed to do so by medical personnel. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get medical attention.

## SECTION 5: FIRE FIGHTING MEASURES

### 5.1 FLAMMABLE PROPERTIES

<b>Autoignition temperature</b>	<i>No Data Available</i>
<b>Flash Point</b>	480 °F [ <i>Test Method: Closed Cup</i> ]
<b>Flammable Limits - LEL</b>	<i>Not Applicable</i>
<b>Flammable Limits - UEL</b>	<i>Not Applicable</i>

## 5.2 EXTINGUISHING MEDIA

Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

## 5.3 PROTECTION OF FIRE FIGHTERS

**Special Fire Fighting Procedures:** Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture. Water may be used to blanket the fire. Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

**Unusual Fire and Explosion Hazards:** No unusual fire or explosion hazards are anticipated.

**Note:** See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**Accidental Release Measures:** Observe precautions from other sections. Call 3M- HELPS line (1-800-364-3577) for more information on handling and managing the spill. Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel. 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. Contain spill. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Collect as much of the spilled material as possible. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and MSDS. Collect the resulting residue containing solution. Place in a closed container approved for transportation by appropriate authorities. Dispose of collected material as soon as possible.

**In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.**

## SECTION 7: HANDLING AND STORAGE

### 7.1 HANDLING

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Avoid breathing of vapors, mists or spray. Avoid skin contact. Avoid breathing of dust created by cutting, sanding, grinding or machining. For industrial or professional use only. Avoid contact with oxidizing agents. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits. If ventilation is not adequate, use respiratory protection equipment. Keep out of the reach of children. Avoid eye contact.

### 7.2 STORAGE

Store away from heat. Store out of direct sunlight. Keep container in well-ventilated area. Keep container tightly closed. Store away from oxidizing agents.

**SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION****8.1 ENGINEERING CONTROLS**

Provide appropriate local exhaust for cutting, grinding, sanding or machining. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits and/or control dust, fume, or airborne particles. If ventilation is not adequate, use respiratory protection equipment.

**8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)****8.2.1 Eye/Face Protection**

Avoid eye contact.

The following eye protection(s) are recommended: Safety Glasses with side shields.

**8.2.2 Skin Protection**

Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

Gloves made from the following material(s) are recommended: Neoprene, Nitrile Rubber, Polyethylene/Ethylene Vinyl Alcohol.

**8.2.3 Respiratory Protection**

Avoid breathing of vapors, mists or spray. Avoid breathing of dust created by cutting, sanding, grinding or machining.

Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half mask R95 particulate respirator, Half facepiece or fullface air-purifying respirator with P100 particulate filters, Half facepiece or fullface air-purifying respirator with P95 particulate filters, Half facepiece or fullface air-purifying respirator with N95 particulate filters. Consult the current 3M Respiratory Selection Guide for additional information or call 1-800-243-4630 for 3M technical assistance.

**8.2.4 Prevention of Swallowing**

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

**8.3 EXPOSURE GUIDELINES**

<u>Ingredient</u>	<u>Authority</u>	<u>Type</u>	<u>Limit</u>	<u>Additional Information</u>
2,6-di-tert-Butyl-p-Cresol	ACGIH	TWA, inhalable fraction and vapor	2 mg/m <sup>3</sup>	Table A4
2,6-di-tert-Butyl-p-Cresol	OSHA	TWA	10 mg/m <sup>3</sup>	Table Z-1A
Adhesion Promotor	CMRG	TWA	5 ppm	

**SOURCE OF EXPOSURE LIMIT DATA:**

ACGIH: American Conference of Governmental Industrial Hygienists

CMRG: Chemical Manufacturer Recommended Guideline

OSHA: Occupational Safety and Health Administration

AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

**Specific Physical Form:**

Paste

**Odor, Color, Grade:**

White, very mild odor.

**General Physical Form:**

Liquid

**Autoignition temperature**

*No Data Available*

**Flash Point**

480 °F [*Test Method:* Closed Cup]

Flammable Limits - LEL	<i>Not Applicable</i>
Flammable Limits - UEL	<i>Not Applicable</i>
Boiling point	$\geq 260$ °C
Density	1.14 g/ml
Vapor Density	<i>Not Applicable</i>
Vapor Pressure	<i>Not Applicable</i>
Specific Gravity	1.14 [Ref Std: WATER=1]
pH	<i>Not Applicable</i>
Melting point	<i>No Data Available</i>
Solubility in Water	Nil
Evaporation rate	<i>Not Applicable</i>
Volatile Organic Compounds	<i>Not Applicable</i>
Percent volatile	0 % weight
VOC Less H2O & Exempt Solvents	<i>Not Applicable</i>
Viscosity	25000 - 45000 centipoise [@ 73.4 °F] [Test Method: Brookfield]

## SECTION 10: STABILITY AND REACTIVITY

**Stability:** Stable.

**Materials and Conditions to Avoid:** Strong oxidizing agents

**Hazardous Polymerization:** Hazardous polymerization will not occur.

### Hazardous Decomposition or By-Products

<u>Substance</u>	<u>Condition</u>
Aldehydes	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion

## SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

## SECTION 12: ECOLOGICAL INFORMATION

### ECOTOXICOLOGICAL INFORMATION

Not determined.

### CHEMICAL FATE INFORMATION

Not determined.

## SECTION 13: DISPOSAL CONSIDERATIONS

**Waste Disposal Method:** Cure (harden, set, or react) the product according to product instructions.

Reclaim if feasible. Dispose of completely cured (or polymerized) wastes in a sanitary landfill.

As a disposal alternative, incinerate uncured product in an industrial or commercial incinerator in the presence of a combustible material.

Combustion products will include HCl. Facility must be capable of handling halogenated materials.

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

Since regulations vary, consult applicable regulations or authorities before disposal.

## SECTION 14: TRANSPORT INFORMATION

DP-420

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

## SECTION 15: REGULATORY INFORMATION

### US FEDERAL REGULATIONS

Contact 3M for more information.

### 311/312 Hazard Categories:

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

### STATE REGULATIONS

Contact 3M for more information.

### CHEMICAL INVENTORIES

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

All applicable chemical ingredients in this material are listed on the European Inventory of Existing Chemical Substances (EINECS), or are exempt polymers whose monomers are listed on EINECS.

Contact 3M for more information.



**Additional Information:** This base is used in a duo-pak cartridge kit with: SCOTCH-WELD (TM) DP-420 (Part A); Document #1124106; Kit Doc #1124114. ++ Not hazardous according to Canadian WHMIS criteria. Non-WHMIS controlled.

## INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS 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 Reactivity: 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.

### Revision Changes:

Section 14: ID Number(s) Template 1 was added.

Section 2: Ingredient table was added.

Section 8: Exposure guidelines ingredient information was added.

Section 8: Exposure guidelines data source legend was added.

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### SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** 3M(TM) Scotch-Weld(TM) Epoxy Adhesive DP-420, Off-White (Part A)

**MANUFACTURER:** 3M

**DIVISION:** Industrial Adhesives and Tapes Division

**ADDRESS:** 3M Center  
St. Paul, MN 55144-1000

**EMERGENCY PHONE:** 1-800-364-3577 or (651) 737-6501 (24 hours)

**Issue Date:** 10/24/2007

**Supersedes Date:** 01/31/2007

**Document Group:** 22-0528-4

**Product Use:**

Specific Use: Part A of 2-Part Epoxy Adhesive

Intended Use: Industrial use

### SECTION 2: INGREDIENTS

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>% by Wt</u>
4,7,10-Trioxatridecane-1,13-Diamine	4246-51-9	40 - 70
Epoxy Resin	25068-38-6	10 - 30
Modified Diglycidyl Ether of Bisphenol A - N.J.T.S. Reg No. 04499600-5023P	Trade Secret	7 - 13
2,4,6-tris((Dimethylamino)Methyl)Phenol	90-72-2	3 - 7
Amorphous Silica	67762-90-7	1 - 5
Catalyst - N.J.T.S. Reg No. 04499600-5022P	Trade Secret	1 - 5

### SECTION 3: HAZARDS IDENTIFICATION

#### 3.1 EMERGENCY OVERVIEW

**Specific Physical Form:** Paste

**Odor, Color, Grade:** Amber, very mild pungent odor.

**General Physical Form:** Liquid

**Immediate health, physical, and environmental hazards:** May cause chemical eye burns. May cause allergic skin reaction. May cause chemical skin burns. May cause chemical gastrointestinal burns.

#### 3.2 POTENTIAL HEALTH EFFECTS

**Eye Contact:**

Corrosive (Eye Burns): Signs/symptoms may include cloudy appearance of the cornea, chemical burns, severe pain, tearing, ulcerations, significantly impaired vision or complete loss of vision.

Vapors released during curing may cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Dust created by cutting, grinding, sanding, or machining may cause eye irritation. Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

**Skin Contact:**

Corrosive (Skin Burns): Signs/symptoms may include localized redness, swelling, itching, intense pain, blistering, ulceration, and tissue destruction.

Prolonged or repeated exposure may cause:

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

**Inhalation:**

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

Dust from cutting, grinding, sanding or machining may cause irritation of the respiratory system. Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

**Ingestion:**

Gastrointestinal Corrosion: Signs/symptoms may include severe mouth, throat and abdominal pain; nausea; vomiting; and diarrhea; blood in the feces and/or vomitus may also be seen.

## SECTION 4: FIRST AID MEASURES

### 4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

**Eye Contact:** Immediately flush eyes with large amounts of water for at least 15 minutes. Get immediate medical attention.

**Skin Contact:** Remove contaminated clothing and shoes. Immediately flush skin with large amounts of water for at least 15 minutes. Get immediate medical attention. Wash contaminated clothing and clean shoes before reuse.

**Inhalation:** Remove person to fresh air. If signs/symptoms develop, get medical attention.

**If Swallowed:** Do not induce vomiting. Give victim two glasses of water. Never give anything by mouth to an unconscious person. Get immediate medical attention.

## SECTION 5: FIRE FIGHTING MEASURES

### 5.1 FLAMMABLE PROPERTIES

Autoignition temperature	No Data Available
Flash Point	$\geq 340$ °F [Test Method: Closed Cup]
Flammable Limits - LEL	Not Applicable
Flammable Limits - UEL	Not Applicable

### 5.2 EXTINGUISHING MEDIA

Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide).

### 5.3 PROTECTION OF FIRE FIGHTERS

**Special Fire Fighting Procedures:** Water may not effectively extinguish fire; however, it should be used to keep fire-exposed containers and surfaces cool and prevent explosive rupture. Water may be used to blanket the fire. Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

**Unusual Fire and Explosion Hazards:** No unusual fire or explosion hazards are anticipated.

**Note:** See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**Accidental Release Measures:** Observe precautions from other sections. Call 3M- HELPS line (1-800-364-3577) for more information on handling and managing the spill. Evacuate unprotected and untrained personnel from hazard area. The spill should be cleaned up by qualified personnel. 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. Contain spill. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Collect as much of the spilled material as possible. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and MSDS. Collect the resulting residue containing solution. Place in a closed container approved for transportation by appropriate authorities. Dispose of collected material as soon as possible.

**In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.**

## SECTION 7: HANDLING AND STORAGE

### 7.1 HANDLING

Avoid eye contact. Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water. Avoid breathing of vapors, mists or spray. Avoid skin contact. Keep out of the reach of children. Avoid breathing of dust created by cutting, sanding, grinding or machining. For industrial or professional use only. Avoid contact with oxidizing agents. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits. If ventilation is not adequate, use respiratory protection equipment.

## 7.2 STORAGE

Store away from acids. Store away from heat. Store out of direct sunlight. Keep container in well-ventilated area. Keep container tightly closed. Store away from flammable and combustible materials. Store away from oxidizing agents.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 ENGINEERING CONTROLS

Use with appropriate local exhaust ventilation. Provide appropriate local exhaust for cutting, grinding, sanding or machining. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits and/or control dust, fume, or airborne particles. If ventilation is not adequate, use respiratory protection equipment.

### 8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

#### 8.2.1 Eye/Face Protection

Avoid eye contact.

The following eye protection(s) are recommended: Safety Glasses with side shields, Indirect Vented Goggles.

#### 8.2.2 Skin Protection

Avoid skin contact.

Select and use gloves and/or protective clothing to prevent skin contact based on the results of an exposure assessment. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible materials.

Gloves made from the following material(s) are recommended: Neoprene, Nitrile Rubber.

#### 8.2.3 Respiratory Protection

Avoid breathing of vapors, mists or spray. Avoid breathing of dust created by cutting, sanding, grinding or machining.

Select one of the following NIOSH approved respirators based on airborne concentration of contaminants and in accordance with OSHA regulations: Half facepiece or fullface air-purifying respirator with organic vapor cartridges and P95 particulate prefilters, Half facepiece or fullface air-purifying respirator with organic vapor cartridges and N95 particulate prefilters, Half facepiece or fullface air-purifying respirator with organic vapor cartridges and P100 particulate prefilters. Consult the current 3M Respiratory Selection Guide for additional information or call 1-800-243-4630 for 3M technical assistance.

#### 8.2.4 Prevention of Swallowing

Do not eat, drink or smoke when using this product. Wash exposed areas thoroughly with soap and water.

### 8.3 EXPOSURE GUIDELINES

<u>Ingredient</u>	<u>Authority</u>	<u>Type</u>	<u>Limit</u>	<u>Additional Information</u>
Catalyst - N.J.T.S. Reg No. 04499600-5022P	3M	TWA	0.1 mg/m3	Skin Notation*
Amorphous Silica	CMRG	CEIL	5 mg/m3	
2,4,6-tris((Dimethylamino)Methyl)Phenol	CMRG	TWA	5 ppm	

\* Substance(s) refer to the potential contribution to the overall exposure by the cutaneous route including mucous membrane and eye, either by airborne or, more particularly, by direct contact with the substance. Vehicles can alter skin absorption.

#### SOURCE OF EXPOSURE LIMIT DATA:

ACGIH: American Conference of Governmental Industrial Hygienists

CMRG: Chemical Manufacturer Recommended Guideline

OSHA: Occupational Safety and Health Administration

AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

<b>Specific Physical Form:</b>	Paste
<b>Odor, Color, Grade:</b>	Amber, very mild pungent odor.
<b>General Physical Form:</b>	Liquid
<b>Autoignition temperature</b>	<i>No Data Available</i>
<b>Flash Point</b>	$\geq 340$ °F [ <i>Test Method: Closed Cup</i> ]
<b>Flammable Limits - LEL</b>	<i>Not Applicable</i>
<b>Flammable Limits - UEL</b>	<i>Not Applicable</i>
<b>Boiling point</b>	$\geq 175$ °C
<b>Density</b>	1.12 g/ml
<b>Vapor Density</b>	<i>Not Applicable</i>
<b>Vapor Pressure</b>	<i>Not Applicable</i>
<b>Specific Gravity</b>	1.12 [ <i>Ref Std: WATER=1</i> ]
<b>pH</b>	<i>Not Applicable</i>
<b>Melting point</b>	<i>No Data Available</i>
<b>Solubility in Water</b>	Slight (less than 10%)
<b>Evaporation rate</b>	<i>Not Applicable</i>
<b>Volatile Organic Compounds</b>	<i>Not Applicable</i>
<b>Percent volatile</b>	0 % weight
<b>VOC Less H2O &amp; Exempt Solvents</b>	<i>Not Applicable</i>
<b>Viscosity</b>	7000 - 13000 centipoise [ <i>@ 73.4 °F</i> ]

**SECTION 10: STABILITY AND REACTIVITY**

**Stability:** Stable.

**Materials and Conditions to Avoid:** Alcohols; Amines; Strong acids; Strong bases; Strong oxidizing agents; Heat is generated during cure. Do not cure a mass larger than 50 grams in a confined space to prevent a premature reaction (exotherm) with production of intense heat and smoke.

**Hazardous Polymerization:** Hazardous polymerization will not occur.

**Hazardous Decomposition or By-Products**

<u>Substance</u>	<u>Condition</u>
Aldehydes	During Combustion
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion

**SECTION 11: TOXICOLOGICAL INFORMATION**

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

**SECTION 12: ECOLOGICAL INFORMATION**

## ECOTOXICOLOGICAL INFORMATION

Not determined.

## CHEMICAL FATE INFORMATION

Not determined.

## SECTION 13: DISPOSAL CONSIDERATIONS

**Waste Disposal Method:** Cure (harden, set, or react) the product according to product instructions.

Dispose of completely cured (or polymerized) wastes in a sanitary landfill.

As a disposal alternative, incinerate uncured product in an industrial or commercial incinerator in the presence of a combustible material.

Combustion products will include HF and HCl. Facility must be capable of handling halogenated materials.

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

Since regulations vary, consult applicable regulations or authorities before disposal.

## SECTION 14: TRANSPORT INFORMATION

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

## SECTION 15: REGULATORY INFORMATION

### US FEDERAL REGULATIONS

Contact 3M for more information.

### 311/312 Hazard Categories:

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

### STATE REGULATIONS

Contact 3M for more information.

## CHEMICAL INVENTORIES

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

All applicable chemical ingredients in this material are listed on the European Inventory of Existing Chemical Substances (EINECS), or are exempt polymers whose monomers are listed on EINECS.

Contact 3M for more information.

## INTERNATIONAL REGULATIONS

Contact 3M for more information.

This MSDS 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 Reactivity: 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.

### Revision Changes:

Section 2: Ingredient table was added.

Section 8: Exposure guidelines ingredient information was added.

Section 8: Exposure guideline note was added.

Section 8: Exposure guidelines data source legend was added.

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# Scotch-Weld™

## Epoxy Adhesive

DP420 Black • DP420 NS Black • DP420 Off-White • DP420 LH

### Technical Data

March, 2012

**Product Description** 3M™ Scotch-Weld™ Epoxy Adhesives are high performance, two-part epoxy adhesives offering outstanding shear and peel adhesion, and very high levels of durability.

- |                 |   |  |
|-----------------|---|--|
| <b>Features</b> | <ul style="list-style-type: none"> <li>• High shear strength</li> <li>• High peel strength</li> <li>• Outstanding environmental performance</li> <li>• Easy mixing</li> <li>• 20 minute worklife</li> </ul> | <ul style="list-style-type: none"> <li>• Controlled flow (3M™ Scotch-Weld™ Epoxy Adhesive DP420 NS Black)</li> <li>• Recognized as meeting UL 94 HB – Underwriters Laboratory Horizontal Burn Flammability Test (3M™ Scotch-Weld™ Epoxy Adhesive DP420 Off-White)</li> <li>• Low halogen content (3M™ Scotch-Weld™ Epoxy Adhesive DP420 LH)</li> </ul> |
|-----------------|---|--|

**Typical Uncured Physical Properties** **Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.**

Product		3M™ Scotch-Weld™ Epoxy Adhesive			
		DP420 Black	DP420 NS Black	DP420 Off-White	DP420 LH
<b>Viscosity (approx.) @ 73°F (23°C)</b>	<b>Base Accelerator</b>	20,000-50,000 cP 8,000-14,000 cP	190,000-270,000 cP 60,000-130,000 cP	20,000-50,000 cP 8,000-14,000 cP	20,000-50,000 cP 8,000-14,000 cP
<b>Base Resin</b>	<b>Base Accelerator</b>	epoxy amine	epoxy amine	epoxy amine	epoxy amine
<b>Color</b>	<b>Base Accelerator</b>	black amber	black amber	white amber	white amber
<b>Net Weight Lbs./Gallon</b>	<b>Base Accelerator</b>	9.3-9.7 9.0-9.4	9.4-9.8 9.1-9.5	9.3-9.7 9.0-9.4	9.3-9.7 9.0-9.4
<b>Mix Ratio (B:A)</b>	<b>Volume Weight</b>	2:1 2:0.97	2:1 2:0.97	2:1 2:0.97	2:1 2:0.97
<b>Worklife, 73°F (23°C)</b>	<b>20 g mixed 10 g mixed 5 g mixed</b>	15 minutes 20 minutes 30 minutes	— — —	15 minutes 20 minutes 30 minutes	15 minutes 20 minutes 30 minutes

# 3M™ Scotch-Weld™ Epoxy Adhesive

DP420 Black • DP420 NS Black • DP420 Off-White • DP420 LH

## Typical Cured Properties

**Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.**

The properties of cured 3M™ Scotch-Weld™ Epoxy Adhesive DP420 NS Black and 3M™ Scotch-Weld™ Epoxy Adhesive DP420 LH are expected to be similar to the properties of 3M™ Scotch-Weld™ Epoxy Adhesive DP420 Black and 3M™ Scotch-Weld™ Epoxy Adhesive DP420 Off-White, respectively as described by data in the following sections of this technical data sheet.

An exception to this is the concentration of halogens in Scotch-Weld DP420 LH. Scotch-Weld DP420 LH is a form of Scotch-Weld DP420 Off-White that can be considered “low halogen”. Low halogen is defined by the Electrotechnical Commission (IEC) 61249-2-21 standard as having less than 900 ppm chlorine, 900 ppm bromine, and less than 1500 ppm total chlorine and bromine.

### 3M™ Scotch-Weld™ DP420 LH Test Results

Halogens (determined by ion chromatography)		
Total Chlorine (ppm)	Total Bromine (ppm)	Total Halogens (ppm)
720	<5	<800

Product	3M™ Scotch-Weld™ Epoxy Adhesive DP420 Black	3M™ Scotch-Weld™ Epoxy Adhesive DP420 Off-White
<b>Physical</b> Color	Black	Opaque, off-white
Shore D Hardness	75-80	75-80
<b>Thermal</b> Coefficient of Thermal Expansion (in./in./°C)	Below Tg 80 x 10 <sup>-6</sup> Above Tg 194 x 10 <sup>-6</sup>	85 x 10 <sup>-6</sup> 147 x 10 <sup>-6</sup>
Thermal Conductivity (btu - ft./ft. <sup>2</sup> - hr. - °F) @ 45°C	0.104	0.104
<b>Electrical</b> Dielectric Strength (ASTM D 149)	888 volts/mil	690 volts/mil
Volume Resistivity (ASTM D 257)	1.6 x 10 <sup>15</sup> ohm-cm	1.3 x 10 <sup>14</sup> ohm-cm

# 3M™ Scotch-Weld™

## Epoxy Adhesive

DP420 Black • DP420 NS Black • DP420 Off-White • DP420 LH

### Typical Curing Characteristics

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

#### Rate of Strength Build-Up

Aluminum, Overlap Shear (7 mil Bondline) (ASTM D 1002-72)

Bonds Tested at 73°F (23°C)

3M™ Scotch-Weld™ Epoxy Adhesive DP420 Black

Time in Oven	Cure Temperature		
	73°F (23°C)	120°F <sup>1</sup> (49°C)	140°F <sup>1</sup> (60°C)
15 min.	—	—	3200
30	—	2300	—
60	—	4700	4700
2 hr.	300	—	—
3	800	—	—
5	3000	—	—
6	3700	—	—
24	4500	—	—

<sup>1</sup>This represents the oven temperature to which the bonds were subjected for the prescribed time. The average bondline temperature during the cure time will be somewhat lower than the oven temperature.

**NOTE:** The data in this data sheet were generated using the 3M™ EPX™ Applicator System equipped with an EPX static mixer, according to manufacturer's directions. Thorough hand-mixing will afford comparable results.

# 3M™ Scotch-Weld™

## Epoxy Adhesive

DP420 Black • DP420 NS Black • DP420 Off-White • DP420 LH

### Typical Adhesive Performance Characteristics

**Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.**

#### Substrates and Testing

##### A. Overlap Shear (ASTM D 1002-72)

Overlap shear (OLS) strengths were measured on 1 in. wide 1/2 in. overlap specimens. These bonds were made individually using 1 in. x 4 in. pieces of substrate except for aluminum. Two panels 0.063 in. thick, 4 in. x 7 in. of 2024T-3 clad aluminum were bonded and cut into 1 in. wide samples after 24 hours. The thickness of the bondline was 0.005-0.008 in. All strengths were measured at 73°F (23°C) except where noted.

The separation rate of the testing jaws was 0.1 in. per minute for metals, 2 in. per minute for plastics and 20 in. per minute for rubbers. The thickness of the substrates were: steel, 0.060 in.; other metals, 0.05-0.064 in.; rubbers, 0.125 in.; plastics, 0.125 in.

##### B. T-peel (ASTM D 1876-61T)

T-peel strengths were measured on 1 in. wide bonds at 73°F (23°C). The testing jaw separation rate was 20 inches per minute. The substrates were 0.032 in. thick.

##### C. Bell Peel (ASTM D 3167)

Bell peel strengths were measured on 1/2 in. wide bonds at the temperatures noted. The testing jaw separation rate was 6 in. per minute. The bonds are made with 0.064 in. bonded to 0.025 in. thick adherends.

##### D. Cure Cycle

With the exception of Rate of Strength Build-Up Tests, all bonds, were cured 7 days at 73°F (23°C) at 50% RH before testing or subjected to further conditioning or environmental aging.

#### Aluminum, Overlap Shear, at Temperature (PSI)

	3M™ Scotch-Weld™ Epoxy Adhesive DP420 Black	3M™ Scotch-Weld™ Epoxy Adhesive DP420 Off-White
-67°F (-55°C)	4500	4500
73°F (23°C)	4500	4500
180°F (82°C) (15 min.) <sup>1</sup>	1260	450
(30 min.) <sup>1</sup>	2250	700
(60 min.) <sup>1</sup>	2980	750
(4 hr.) <sup>1</sup>	2690	2500
250°F (121°C) (15 min.) <sup>1</sup>	570	200

<sup>1</sup>Represents time in test chamber oven before test.

#### Metals, Overlap Shear, Tested @ 73°F (23°C) (PSI)

	Scotch-Weld Epoxy Adhesive DP420 Black	Scotch-Weld Epoxy Adhesive DP420 Off-White
Aluminum- Etched	4500	4500
Oakite degrease	4000	3500
MEK/abrade/MEK	2500	3500
Cold Rolled Steel- Oakite degrease	—	4000
MEK/abrade/MEK	2200	2700
Copper- MEK/abrade/MEK	5000	4000
Brass- MEK/abrade/MEK	2800	4100
Stainless Steel- MEK/abrade/MEK	1800	1700
Galvanized Steel- Hot dipped	2900	2000
Electrodeposited	3000	2100

# 3M™ Scotch-Weld™

## Epoxy Adhesive

DP420 Black • DP420 NS Black • DP420 Off-White • DP420 LH

**Typical Adhesive Performance Characteristics**  
(continued)

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

**Substrates and Testing (continued)**

**Aluminum, T-Peel (PIW), at Temperature**

	3M™ Scotch-Weld™ Epoxy Adhesive DP420 Black	3M™ Scotch-Weld™ Epoxy Adhesive DP420 Off-White
-67°F (-55°C)	9.3	5-10
73°F (23°C)	50	50
180°F (82°C)	20	3-5

**Metals, T-Peel, Tested @ 73°F (23°C) (PIW)**

		Scotch-Weld Epoxy Adhesive DP420 Black	Scotch-Weld Epoxy Adhesive DP420 Off-White
Aluminum, etched	17-20 mil bondline	60	50
	5-8 mil bondline	50	40
Cold Rolled Steel	17-20 mil bondline	40	40
	Oakite degreased MEK/abrade/MEK	25	25

**Aluminum, Bell Peel (PIW), at Temperature**

	Scotch-Weld Epoxy Adhesive DP420 Black	Scotch-Weld Epoxy Adhesive DP420 Off-White
-67°F (-55°C)	20	not tested
73°F (23°C)	82	
180°F (82°C)	18	

**Other Substrates, Overlap Shear Tested @ 73°F (23°C) (PSI)**

Substrate	Surf. Prep. 1 <sup>1</sup>		Surf. Prep. 2 <sup>2</sup>	
	Scotch-Weld Epoxy Adhesive DP420 Black	Scotch-Weld Epoxy Adhesive DP420 Off-White	Scotch-Weld Epoxy Adhesive DP420 Black	Scotch-Weld Epoxy Adhesive DP420 Off-White
ABS PVC	450	320	550	500
Polycarbonate	400 <sup>3</sup>	220	360 <sup>3</sup>	300
Polyacrylic	440	400	450	550
Polystyrene	190	230	450	280
FRP	380	350	580	380
Phenolic	600	350	1100 <sup>3</sup>	1300 <sup>3</sup>
SBR/Steel	1400 <sup>3</sup>	1400 <sup>3</sup>	1300 <sup>3</sup>	1400 <sup>3</sup>
Neoprene/Steel	70	150 <sup>3</sup>	180 <sup>3</sup>	150 <sup>3</sup>
	80	40	100 <sup>3</sup>	80 <sup>3</sup>

<sup>1</sup>Isopropyl Alcohol Wipe. See Surface Preparation Section D for additional information.

<sup>2</sup>Isopropyl Alcohol/Abrade/Isopropyl Alcohol: See Surface Preparation Section E for additional information.

<sup>3</sup>Substrate failure.

# 3M™ Scotch-Weld™

## Epoxy Adhesive

DP420 Black • DP420 NS Black • DP420 Off-White • DP420 LH

### Typical Adhesive Performance Characteristics (continued)

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

#### Substrates and Testing (continued)

#### Environmental Resistance

#### Aluminum (Etched)

Measured by Overlap Shear Tested @ 73°F (23°C) (PSI)<sup>1</sup> (ASTM D 1002-72)

Environment	Condition	3M™ Scotch-Weld™ Epoxy Adhesive DP420 Black	3M™ Scotch-Weld™ Epoxy Adhesive DP420 Off-White
73°F (23°C)/50% RH	30 d <sup>2</sup>	4900	5100
Distilled Water	30 d, i <sup>3</sup>	4200	4700
Water Vapor	120°F (49°C)/100% RH, 30 d 200°F (93°C)/100% RH, 14 d	4000 4000	4700 3000
Antifreeze/H <sub>2</sub> O (50/50)	180°F (82°C), 30 d, i	3000	4200
Isopropyl Alcohol	73°F (23°C), 30 d, i	4500	5300
Methyl Ethyl Ketone	73°F (23°C), 30 d, i	3500	4600
Salt Spray (5%)	95°F (35°C), 30 d	—	5100
Skydrol LD-4	150°F (66°C), 30 d, i	4000	5400

<sup>1</sup>Data reported are actual values from the lots tested and may be higher than values published elsewhere in this data sheet.

<sup>2</sup>d = days

<sup>3</sup>i = immersion

### 3M™ EPX™ Pneumatic Applicator Delivery Rates

#### 200 ml Applicator – Maximum Pressure 58 psi

Adhesive*	6mm Nozzle gms/minute	10mm Nozzle gms/minute
3M™ Scotch-Weld™ Epoxy Adhesive DP420 Black	29.6	113
3M™ Scotch-Weld™ Epoxy Adhesive DP420 Off-White	31.1	132

\*Tests were run at a temperature of 70°F ± 2°F (21°C ± 1°C) and at maximum applicator pressure.

# 3M™ Scotch-Weld™

## Epoxy Adhesive

DP420 Black • DP420 NS Black • DP420 Off-White • DP420 LH

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### Handling/Application Information

#### Directions for Use

3M™ Scotch-Weld™ Epoxy Adhesive DP420 is supplied in dual syringe plastic duo-pak cartridges as part of the 3M™ EPX™ Applicator System. The duo-pak cartridges are supplied in 37 ml, 200 ml and 400 ml configurations. To use the EPX cartridge system simply insert the duo-pak cartridge into the EPX applicator. Next, remove the duo-pak cartridge cap and expel a small amount of adhesive to be sure both sides of the duo-pak cartridge are flowing evenly and freely. If simultaneous mixing of Part A and Part B is desired, attach the EPX mixing nozzle to the duo-pak cartridge and begin dispensing the adhesive.

When mixing Part A and Part B manually the components must be mixed in the ratio indicated in the typical uncured properties section of this data sheet. Complete mixing of the two components is required to obtain optimum properties.

Two-part mixing/proportioning/dispensing equipment is available for intermittent or production line use. These systems are ideal for line uses because of their variable shot size and flow rate characteristics and are adaptable to most applications.

Apply adhesive to clean, dry surfaces, joint parts and secure until adhesive sets (see rate of strength build up).

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### Surface Preparation

The following surface preparations were used for substrates described in this Technical Data Sheet.

#### A. Aluminum Etch

Optimized FPL Etch - 3M (test method C-2803)

1. Alkaline degrease – Oakite 164 solution (9-11 oz./gallon water) at 190°F ± 10°F (88°C ± 5°C) for 10-20 minutes. Rinse immediately in large quantities of cold running water (3M test method C-2802).
2. Optimized FPL Etch Solution (1 liter):

Material	Amount
Distilled Water	700 ml plus balance of liter (see below)
Sodium Dichromate	28 to 67.3 grams
Sulfuric Acid	287.9 to 310.0 grams
Aluminum Chips	1.5 grams/liter of mixed solution

To prepare 1 liter of this solution, dissolve sodium dichromate in 700 ml of distilled water. Add sulfuric acid and mix well. Add additional distilled water to fill to 1 liter. Heat mixed solution to 66 to 71°C (150 to 160°F). Dissolve 1.5 grams of 2024 bare aluminum chips per liter of mixed solution. Gentle agitation will help aluminum dissolve in about 24 hours.

To FPL etch panels, place them in the above solution at 150 to 160°F (66 to 71°C) for 12 to 15 minutes.

**Note:** Review and follow precautionary information provided by chemical suppliers prior to preparation of this etch solution.

3. Rinse immediately in large quantities of clear running tap water.



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## Epoxy Adhesive

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### Surface Preparation (continued)

4. Dry – air dry approximately 15 minutes followed by force dry at 140°F (60°C) maximum for 10 minutes (minimum).
5. Both surface structure and chemistry play a significant role in determining the strength and permanence of bonded structures. It is therefore advisable to bond or prime freshly primed clean surfaces as soon as possible after surface preparation in order to avoid contamination and/or mechanical damage. Please contact your 3M sales representative for primer recommendations.

#### **B. Oakite Degrease**

Oakite 164 solutions (9-11 oz./gallon of water) at 190°F ± 10°F (88°C ± 5°C) for 2 minutes. Rinse immediately in large quantities of cold running water.

#### **C. MEK/Abrade/MEK**

Wipe surface with a methyl ethyl ketone (MEK) soaked swab, abrade and wipe with a MEK soaked swab.\* Allow solvent to evaporate before applying adhesive.

**\*Note:** When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

#### **D. Isopropyl Alcohol Wipe Only Surface Preparation**

Wipe surface with an isopropyl alcohol soaked swab.\* Allow solvent to evaporate before applying adhesive.

**\*Note:** When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

#### **E. Isopropyl Alcohol/Abrade/Isopropyl Alcohol Surface Preparation**

Wipe surface with an isopropyl alcohol soaked swab, abrade using clean fine grit abrasives, and wipe with an isopropyl alcohol soaked swab.\* Then allow solvent to evaporate before applying adhesive.

**\*Note:** When using solvents, extinguish all ignition sources, including pilot lights, and follow the manufacturer's precautions and directions for use.

# 3M™ Scotch-Weld™

## Epoxy Adhesive

DP420 Black • DP420 NS Black • DP420 Off-White • DP420 LH

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**Storage** Store products at 60-80°F (15-27°C) or refrigerate for maximum shelf life.

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**Shelf Life** These products have a shelf life of 15 months in original containers at room temperature.

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**Precautionary Information** Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

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**Technical Information** The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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**Product Use** Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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