

Technical Data Sheet

3M™ Scotch-Weld™ Epoxy Adhesive DP105 Clear

Product Description

3M™ Scotch-Weld™ Epoxy Adhesive DP105 Clear is available in larger containers like 3M™ Scotch-Weld™ Epoxy Adhesive 105 B/A Clear. 3M™ Scotch-Weld Epoxy Adhesive DP105 Clear is a fast setting, very flexible 1:1 mix ratio epoxy adhesive/sealant. Its flexibility when cured makes it ideal for applications involving dissimilar surfaces where thermal coefficient of expansion may be a problem. It is also unique in that it retains its clear, colorless properties longer than most 5 minute epoxies.


Product Features

- 4 minute worklife
- High peel strength
- Flexible
- 1:1 mix ratio
- Clear

Technical Information Note



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

Typical Uncured Physical Properties

Property	Values	Additional Information
Color	Clear	View 

Notes: Colors may vary from nearly white to yellow/amber. Adhesive performance is not affected by color variation.

Base Color	Clear
Accelerator Color	Clear

Base Viscosity	1,000-5,000 cP	View 
Test Method: 3M C1d Temp C: 27C Temp F: 80F Notes: Procedure involves Brookfield RVF, #7 spindle, 20 rpm. Measurement taken after 1 minute rotation.		
Accelerator Viscosity	8,000-16,000 cP	View 

Test Method: 3M C1d

Temp C: 27C
Temp F: 80F

Notes: Procedure involves Brookfield RVF, #7 spindle, 20 rpm. Measurement taken after 1 minute rotation.

Base Resin	Epoxy
Accelerator Resin	Mercaptan
Base Net Weight	9.1 to 9.5 lb/gal
Accelerator Net Weight	9.4 to 9.8 lb/gal
Mix Ratio by Volume (B:A)	1:1
Mix Ratio by Weight (B:A)	1:0.97


Typical Mixed Physical Properties

Property	Values	Additional Information
Open Time	5 min	View
Notes: POR=Pop Off Rubber		
Exotherm max temp	37 °C	View
Notes: Exotherm determined using the stated mass mixed for 1 minute and then by electronic thermocouple measuring the peak temperature and time to that temperature.		
Exotherm max temp	98 °F	View
Notes: Exotherm determined using the stated mass mixed for 1 minute and then by electronic thermocouple measuring the peak temperature and time to that temperature.		
Exotherm time to reach max temp	5 min	View
Notes: Exotherm determined using the stated mass mixed for 1 minute and then by electronic thermocouple measuring the peak temperature and time to that temperature.		
Exotherm max temp	110 °C	View
Notes: Exotherm determined using the stated mass mixed for 1 minute and then by electronic thermocouple measuring the peak temperature and time to that temperature.		
Exotherm max temp	230 °F	View

Notes: Exotherm determined using the stated mass mixed for 1 minute and then by electronic thermocouple measuring the peak temperature and time to that temperature.

Exotherm time to reach max temp	3 min	View 
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Notes: Exotherm determined using the stated mass mixed for 1 minute and then by electronic thermocouple measuring the peak temperature and time to that temperature.

Worklife, 2g mixed	5 min	View 
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Test Method: 3M C3180

Temp C: 23C
Temp F: 73F


Notes: Procedure involves periodically measuring a 2 gram mixed mass for self leveling and wetting properties. This time will also approximate the usable worklife in an 3M™ EPX™ Applicator mixing nozzle.

Worklife, 20g mixed	4 min	View 
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Test Method: 3M C3180

Temp C: 23C
Temp F: 73F


Notes: Procedure involves periodically measuring a 2 gram mixed mass for self leveling and wetting properties. This time will also approximate the usable worklife in an 3M™ EPX™ Applicator mixing nozzle.

Worklife	3 to 4 min	View 
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Test Method: 3M C3180


Temp C: 23C
Temp F: 73F

Notes: Procedure involves periodically measuring a 2 gram mixed mass for self leveling and wetting properties. This time will also approximate the usable worklife in an 3M™ EPX™ Applicator mixing nozzle.

Set Time (min)	20 min	View 
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Temp C: 23C
Temp F: 73F

Notes: Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.

Tack Free Time	10 min	View 
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Test Method: 3M C3173

Notes: Involves dispensing 0.5 gram amount of adhesive onto substrate and testing periodically for no adhesive transfer to metal spatula.


Time to Full Cure	0.33 hr	View 
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Temp C: 23C
Temp F: 73F

Notes: The cure time is defined as that time required for the adhesive to achieve a minimum of 80% of the ultimate strength as measured by aluminum-aluminum OLS.

Time to Full Cure	48 hr	View 
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Temp C: 23C
Temp F: 73F

Rate of Strength Buildup 1hr	250 lb/in ²	View 
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Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 1.0
Dwell Time Units: hr
Temp C: 23C
Temp F: 72F
Substrate: Etched Aluminum

Notes: 1 in wide 1/2 in overlap specimens with 1 in x 4 in substrates. 0.005-0.008in bondline. Jaw separation 0.1 in/min. Substrate thickness 0.05-0.064 in

Rate of Strength Buildup 6hr

500 lb/in²

View 

Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 6.0
Dwell Time Units: hr
Temp C: 23C
Temp F: 72F
Substrate: Etched Aluminum

Notes: 1 in wide 1/2 in overlap specimens with 1 in x 4 in substrates. 0.005-0.008in bondline. Jaw separation 0.1 in/min. Substrate thickness 0.05-0.064 in

Rate of Strength Buildup 1day

1000 lb/in²

View 


Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 1.0
Dwell Time Units: day
Temp C: 23C
Temp F: 72F
Substrate: Etched Aluminum

Notes: 1 in wide 1/2 in overlap specimens with 1 in x 4 in substrates. 0.005-0.008in bondline. Jaw separation 0.1 in/min. Substrate thickness 0.05-0.064 in

Rate of Strength Buildup 7day

2000 lb/in²

View 

Test Method: ASTM D1002

Test Name: Overlap Shear Strength
Dwell/Cure Time: 7.0
Dwell Time Units: day
Temp C: 23C
Temp F: 72F
Substrate: Etched Aluminum

Notes: 1 in wide 1/2 in overlap specimens with 1 in x 4 in substrates. 0.005-0.008in bondline. Jaw separation 0.1 in/min. Substrate thickness 0.05-0.064 in

Rate of Strength Buildup 1month

2000 lb/in²


View 

Test Method: ASTM D1002







Test Name: Overlap Shear Strength
Dwell/Cure Time: 1.0
Dwell Time Units: month
Temp C: 23C
Temp F: 72F
Substrate: Etched Aluminum

Notes: 1 in wide 1/2 in overlap specimens with 1 in x 4 in substrates. 0.005-0.008in bondline. Jaw separation 0.1 in/min. Substrate thickness 0.05-0.064 in


Typical Physical Properties

Property	Values	Additional Information
Color	Clear	View 
Test Name: Cured		

Typical Cured Characteristics







Property	Values	Additional Information
Shore D Hardness	27	View 
<p>Test Method: ASTM D2240</p> <p>Temp C: 23C Temp F: 73F</p>		
Tensile Strength	600 lb/in ²	View 
<p>Test Method: ASTM D882</p> <p>Dwell/Cure Time: 2.0 Dwell Time Units: hr Temp C: 23C Temp F: 72F Environmental Condition: +2 hr @ 160F(71C)</p> <p>Notes: Samples were 2 in. dumbbells with 0.125 in. neck and .030 in. sample thickness. Separation rate was 2 inches per minute.</p>		
Weight Loss by Thermal Gravimetric Analysis (TGA)	1 %	View 
<p>Test Method: ASTM E1131</p> <p>Temp C: 117C Temp F: 243F</p> <p>Notes: Weight loss by Thermal Gravimetric Analysis reported as that temperature at which 5% weight loss occurs by TGA in air at 5°C (9°F) rise per minute.</p>		
Thermal Shock Resistance	Pass 5 cycles without cracking	View 
<p>Test Method: 3M C3174</p> <p>Notes: Involves potting a metal washer into a 2 in. x 0.5 in. thick section and cycling this test specimen to colder and colder temperatures.</p>		
Weight Loss by Thermal Gravimetric Analysis (TGA)	289 °C	View 
<p>Test Method: ASTM E1131</p> <p>Notes: Weight loss by Thermal Gravimetric Analysis reported as that temperature at which 5% weight loss occurs by TGA in air at 5°C (9°F) rise per minute.</p>		
Weight Loss by Thermal Gravimetric Analysis (TGA)	552 F	View 
<p>Test Method: ASTM E1131</p> <p>Notes: Weight loss by Thermal Gravimetric Analysis reported as that temperature at which 5% weight loss occurs by TGA in air at 5°C (9°F) rise per minute.</p>		

Typical Performance Characteristics

Property	Values	Additional Information
Elongation (%)	120 %	View 
<p>Test Method: ASTM D882</p> <p>Dwell/Cure Time: 2.0 Dwell Time Units: hr Temp C: 23C Temp F: 72F</p>		

Environmental Condition: +2 hr @ 160F(71C)

Notes: Samples were 2 in. dumbbells with 0.125 in. neck and .030 in. sample thickness. Separation rate was 2 inches per minute.

T-Peel Adhesion -55C Etched Aluminum	3 lb/in width	View 
<p>Test Method: ASTM D1876</p> <p>Test Name: T-Peel Adhesion Temp C: -55C Temp F: -67F Substrate: Etched Aluminum</p> <p>Notes: 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 0.020 in. thick. Samples dwelled for 24 hrs at 23C + 2 hrs at 71C before testing.</p>		
T-Peel Adhesion 23C Etched Aluminum	35 lb/in width	View 
<p>Test Method: ASTM D1876</p> <p>Test Name: T-Peel Adhesion Temp C: 23C Temp F: 73F Substrate: Etched Aluminum</p> <p>Notes: 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 0.020 in. thick. Samples dwelled for 24 hrs at 23C + 2 hrs at 71C before testing.</p>		
T-Peel Adhesion 49C Etched Aluminum	5 lb/in width	View 
<p>Test Method: ASTM D1876</p> <p>Test Name: T-Peel Adhesion Temp C: 49C Temp F: 120F Substrate: Etched Aluminum</p> <p>Notes: 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 0.020 in. thick. Samples dwelled for 24 hrs at 23C + 2 hrs at 71C before testing.</p>		
T-Peel Adhesion 66C Etched Aluminum	2 lb/in width	View 
<p>Test Method: ASTM D1876</p> <p>Test Name: T-Peel Adhesion Temp C: 66C Temp F: 150F Substrate: Etched Aluminum</p> <p>Notes: 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 0.020 in. thick. Samples dwelled for 24 hrs at 23C + 2 hrs at 71C before testing.</p>		
T-Peel Adhesion 82C Etched Aluminum	1 lb/in width	View 
<p>Test Method: ASTM D1876</p> <p>Test Name: T-Peel Adhesion Temp C: 82C Temp F: 180F Substrate: Etched Aluminum</p> <p>Notes: 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 0.020 in. thick. Samples dwelled for 24 hrs at 23C + 2 hrs at 71C before testing.</p>		
Solvent Resistance Acetone 1hr	A	View 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Acetone 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Acetone 1month

A

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Acetone 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Isopropyl Alcohol 1hr

A

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Isopropyl Alcohol 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Isopropyl Alcohol 1month

A

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Isopropyl Alcohol 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Freon TF 1hr

A

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Freon TF 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Freon TF 1month

A

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Freon TF 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Freon TMC 1hr

A

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Freon TMC 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance Freon TMC 1month

B

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + Freon TMC 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance 1, 1, 1 - Trichloroethane 1hour

A

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + 1, 1, 1 - Trichloroethane 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance 1, 1, 1 - Trichloroethane 1month

A

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + 1, 1, 1 - Trichloroethane 1mo

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance RMA Flux 1hr

A

[View](#) 

Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + RMA Flux 1hr

Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.

Solvent Resistance RMA Flux 1month	A	View
Environmental Condition: 24hr @ RT + 2hr @ 160F(71C) + RMA Flux 1mo		
Notes: Cured OLS samples immersed in solvent and after dwell, examined for surface attack compared to control. A: Unaffected, no color or texture change B: Slight attack, slight swelling of surface. C: Moderate/severe attack, extreme swelling of surface.		

Electrical and Thermal Properties

Property	Values	Additional Information
Glass Transition Temperature (Tg)	15 °C	View

Notes: Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.

Glass Transition Temperature (Tg)	59 °F	View
Notes: Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.		

Glass Transition Temperature (Tg)	8 °C	View
Notes: Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.		

Glass Transition Temperature (Tg)	46 °F	View
Notes: Glass Transition Temperature (Tg) determined using DSC Analyzer with a heating rate of 68°F (20°C) per minute. Second heat values given.		




Dielectric Constant 1KHz	9.2	View
Test Method: ASTM D150		
Temp C: 23C Temp F: 72F		

Dissipation Factor 1KHz	0.22	View
Test Method: ASTM D150		
Temp C: 23C Temp F: 72F		

Thermal Conductivity	0.35 x 10 ⁻³ Cal/s/cm/°C	View
Test Method: C177		
Temp F: 110F		
Notes: Thermal conductivity determined using C-matic Instrument using 2 in. diameter samples.		

Thermal Conductivity	14.7 W/m/K	View
Test Method: C177		
Temp F: 110F		

Notes: Thermal conductivity determined using C-matic Instrument using 2 in. diameter samples.

Thermal Conductivity	0.085 (btu-ft)/(h-ft ² -°F)	View 
Test Method: C177		
Temp F: 110F		
Notes: Thermal conductivity determined using C-matic Instrument using 2 in. diameter samples.		
Volume Resistivity	1.5 x 10 ¹⁰ Ω-cm	View 
Test Method: ASTM D257		
Temp C: 23C		
Temp F: 73F		
Coefficient of Thermal Expansion	181 x 10 ⁻⁶ m/m/°C	View 
Notes: TCE determined using TMA Analyzer using a heating rate of 10°C per minute. Second heat values given.		

Storage and Shelf Life

Store 3M™ Scotch-Weld™ Epoxy Adhesive DP-105 Clear at 60-80°F (15-27°C) for maximum shelf life.

These epoxy adhesive products have a shelf life of 24 months in their unopened bulk containers. Shelf life is determined from the date of manufacture.

Industry Specifications

[EN 45545 test report for details \(ISO 5659-2, ISO 9239-1, ISO 5660-1, ISO 5658-2\)](#)

Bottom Matter

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Handling/Application Information

Directions for Use

1. For high strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. However, the amount of surface preparation directly depends on the required bond strength and the environmental aging resistance desired by user. For specific surface preparations on common substrates, see the following section on Surface Preparation.

2. Uses gloves to minimize skin contact. Do not use solvents for cleaning hands.

3. Mixing

For Duo-Pak Cartridges

3M™ Scotch-Weld™ Epoxy Adhesive DP105 Clear is supplied in a dual syringe plastic Duo-Pak cartridge as part of the 3M™ Scotch-Weld™ EPX™ Applicator system. To use, simply insert the Duo-Pak cartridge into the EPX applicator and start the plunger into the cylinders using light pressure on the trigger. 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 automatic mixing of Part A and Part B is desired, attach the EPX mixing nozzle to the Duo-Pak cartridge and begin dispensing the adhesives. For hand mixing, expel the desired amount of adhesive and mix thoroughly. Mix approximately 15 seconds after uniform color is obtained.

For Bulk Containers

Mix thoroughly by weight or volume in the proportions specified in the Typical Uncured Properties section. Mix approximately 15 seconds after uniform color is obtained.

4. For maximum bond strength apply adhesive evenly to both surfaces to be joined.

5. Application to the substrates should be made within 3 minutes. Larger quantities and/or higher temperatures will reduce this working time.

6. Join the adhesive coated surfaces and allow to cure at 60°F (16°C) or above until completely firm. Heat up to 200°F (93°C), will speed curing. These products will cure in 48 hours @ 75°F (24°C).

7. Keep parts from moving during cure. Contact pressure is necessary. Maximum shear strength is obtained with a 3-5 mil bond line.

8. Excess uncured adhesive can be cleaned up with ketone type solvents.*

Adhesive Coverage: A 0.005 in. thick bondline will yield a coverage of 320 sqft/ gallon.

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

Surface Preparation

For high strength structural bonds, paint, oxide films, oils, dust, mold release agents and all other surface contaminants must be completely removed. However, the amount of surface preparation directly depends on the required bond strength and the environmental aging resistance desired by the user.

The following cleaning methods are suggested for common surfaces:

Steel:

1. Wipe free of dust with oil-free solvent such as acetone, isopropyl or alcohol solvents.*

2. Sandblast or abrade using clean fine grit abrasives.

3. Wipe again with solvent to remove loose particles.

4. If a primer is used, it should be applied within 4 hours after surface preparation.

Aluminum:

1. Vapor Degrease: 3M™ Novec™ condensing vapors for 5-10 minutes.

2. 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.

3. Acid Etch: Place panels in the following solution for 10 minutes at 150°F ± 5°F (66°C ± 2°C).

Sodium Dichromate 4.1 - 4.9 oz./gallon

Sulfuric Acid, 66°Be 38.5 - 41.5 oz./gallon 2024-T3 aluminum (dissolved) 0.2 oz./gallon minimum Tap Water as needed to balance

4. Rinse: Rinse panels in clean running tap water.

5. Dry: Air dry 15 minutes; force dry 10 minutes at 150°F ± 10°F (66°C ± 5°C).

6. If primer is to be used, it should be applied within 4 hours after surface preparation.

Plastics/Rubber:

1. Wipe with isopropyl alcohol.*
2. Abrade using fine grit abrasives.
3. Wipe with isopropyl alcohol.*

Glass:

1. Solvent wipe surface using acetone or MEK.*

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

- For small or intermittent applications the 3M™ Scotch-Weld™ EPX™ Applicator is a convenient method of application.
- For larger applications, these products may be applied by use of flow equipment.
- Two part meter/mixing/dispensing equipment is available for intermittent or production line use. These systems may be desirable because of their variable shot size and flow rate characteristics and are adaptable to many applications.

References

Property	Values
3m.com Product Page	https://www.3m.com/3M/en_US/p/d/b40066495/
Safety Data Sheet SDS	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=DP105 Clear

ISO Statement

This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

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.

Information

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