January, 2017

3M™ Scotch-Weld™ Structural Plastic Adhesive DP8005 Off White

Product Description

3M™ Scotch-Weld™ Structural Plastic Adhesive DP8005 is a two-part acrylic- based adhesive (10:1 ratio by volume) that can bond many low surface energy plastics, including many grades of polypropylene, polyethylene, and TPO's without special surface preparation.
3M™ Scotch-Weld Adhesive DP8005 can replace screws, rivets, plastic welding, and two-step processes which include chemical etchants, priming or surface treatments in many applications.

Product Features

- Ability to Bond Dissimilar Substrates
- Ability to Structurally Bond Polyolefins
- Room Temperature Cure
- Excellent Water and Humidity Resistance
- Very Good Chemical Resistance
- One Step Process - No Pre-Treatment of the Substrates Needed
- Solvent-free Adhesive System
- Convenient Hand-Held Applicator System
- Contains 0.008" glass beads for bondline thickness control
- Available in Bulk

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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	Temp C	Temp F	Notes
Base Color	Amber			
Accelerator Color	White			
Base Viscosity	17000 to 30000 cP	23C	72F	Viscosity obtained by Brookfield, DV-II, #7 Spindle, 20 rpm
Accelerator Viscosity	35000 to 55000 cP	23C	72F	Viscosity obtained by Brookfield, DV-II, #7 Spindle, 20 rpm.
Base Resin	Methacrylate			
Accelerator Resin	Amine			
Base Net Weight	8 to 8.4 lb/gal			
Accelerator Net Weight	8.7 to 9.15 lb/gal			
Mix Ratio by Volume (B:A)	10:1			
Mix Ratio by Weight (B:A)	9.16:1			

Typical Mixed Physical Properties

Property	Values	Temp C	Temp F	Notes
Worklife	2.5 to 3 min	23C	73F	
Time to Handling Strength	2 to 3 hr	23C	73F	Minimum time required to achieve 50 psi of overlap shear strength. Cure times are approximate and depend on adhesive temperature.
Time to Full Cure	8 to 24 hr	23C	73F	Time to develop 80% of maximum overlap shear values.

Typical Physical Properties

Color: Yellow

Conditions
Test Name: Cured

Typical Cured Characteristics

Property	Values	Method	Temp C	Temp F	Notes
Shore D Hardness	55	ASTM D2240	23C	73F	
Strain at Peak Load	5.3 %				Mechanical properties obtained using a Sintech 5GL Mechanical Tester. Approximate dimensions of the test specimen was 1.5" x 0.5" x 0.3". Elongation was determined by crosshead displacement. The crosshead velocity was 0.5"/min.
Peak Stress	1889 lb/in²				Mechanical properties obtained using a Sintech 5GL Mechanical Tester. Approximate dimensions of the test specimen was 1.5" x 0.5" x 0.3". Elongation was determined by crosshead displacement. The crosshead velocity was 0.5"/min.
Modulus at 1% Strain	85669 lb/in²				Mechanical properties obtained using a Sintech 5GL Mechanical Tester. Approximate dimensions of the test specimen was 1.5" x 0.5" x 0.3". Elongation was determined by crosshead displacement. The crosshead velocity was 0.5"/min.

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Typical Performance Characteristics

Temperature Resistance:

Temperature Resistance

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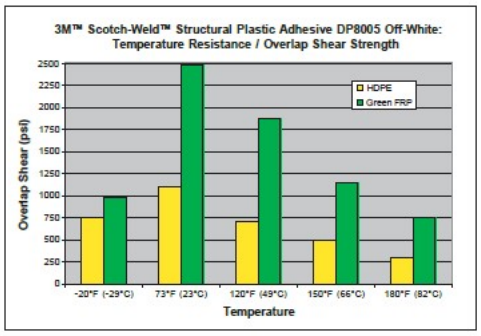
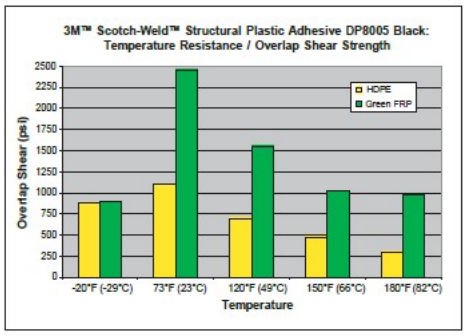




Conditions
Dwell/Cure Time: 48
Dwell Time Units: hr
Temp C: 23C
Temp F: 73F
Test Condition: Room Temperature
Additional Information

Notes: Sample dimensions were 1" x 4" x 1/8" (unless other thicknesses indicated) with an overlap area of 1" x 1/2". Plastics and glass substrates were cleansed with isopropyl alcohol (IPA) wipes; metal substrates were abraded with 150-grit sandpaper and cleansed with methyl ethyl ketone (MEK) wipes. Data were collected using a Sintech 5GL Mechanical Tester with the 2000-lb or 5000-lb load cells. Test rate was 2"/min. for plastic bonds, and 0.1"/min. for metal and glass bonds.

T-Peel Adhesion High Density Polyethylene (HDPE): 17 lb/in width

Conditions
Test Name: T-Peel Adhesion
Substrate: High Density Polyethylene (HDPE)
Failure mode: SF
Methods
ASTM D1876
Additional Information

Notes: Peel tests on 0.02" thick HDPE, 0.017" bondline thickness, 8" x 1" in T-peel mode at a rate of 2.0"/min.

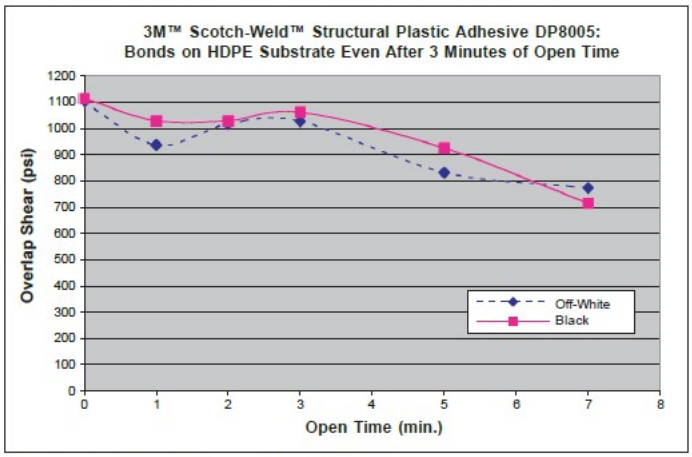
SF = Substrate Failure/Break/Yield, C sh = Cohesive but shocky

Typical Performance Characteristics (continued)

Time and Substrates:

Times and Substrates (9)

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



(9) Open Time Overlap Shear Test done using test method described in footnote 4.

Conditions
Dwell/Cure Time: 48
Dwell Time Units: hr
Temp C: 23C
Temp F: 73F
Test Condition: Room Temperature
Additional Information

Notes: Sample dimensions were 1" x 4" x 1/8" (unless other thicknesses indicated) with an overlap area of 1" x 1/2". Plastics and glass substrates were cleansed with isopropyl alcohol (IPA) wipes; metal substrates were abraded with 150-grit sandpaper and cleansed with methyl ethyl ketone (MEK) wipes. Data were collected using a Sintech 5GL Mechanical Tester with the 2000-lb or 5000-lb load cells. Test rate was 2"/min. for plastic bonds, and 0.1"/min. for metal and glass bonds.

Suggested Substrates:

Suggested Substrates

Note: The following suggestions are based on laboratory tests on typical grades of the listed substrates. Because of the many combinations of process aids and additives that are used with plastic substrates, the user is responsible for determining whether 3M™ Scotch-Weld™ Structural Plastic Adhesive DP8005 is appropriate for a given application.

Potential Primary Surfaces	Polypropylene (PP) Polyethylene (PE, HDPE, LDPE)	
Potential Secondary Surfaces	Fiber Reinforced Plastic (FRP) Polycarbonate (PC) Wood Aluminum Glass Thermoplastic Elastomers (TPE)	PVC ABS Acrylic (PMMA) Polystyrene Concrete Metals
Not Recommended Surfaces Inconsistent results have been exhibited with substrates that contain oils and anti-stats.	PTFE Silicone Surfaces Surfaces Containing Mold-Release Agents Polyimide Nylons	

Electrical and Thermal Properties

Property	Values	Test Condition	Notes
Coefficient of Thermal Expansion	125 ppm/°C	Below Tg	Tg and CTE determined by TMA -40°F to 249°F (-40°C to 120°C) at 10°F (5°C)/min. (after 2 heat cycles).

Table continued on next page

Electrical and Thermal Properties (continued)

Property	Values	Test Condition	Notes
Coefficient of Thermal Expansion	170 ppm/°C	Above Tg	Tg and CTE determined by TMA -40°F to 249°F (-40°C to 120°C) at 10°F (5°C)/min. (after 2 heat cycles).

Handling/Application Information

Directions for Use

Important: Use only the specified 3M™ EPX™ Plus II Applicator system or appropriate meter mix equipment to ensure the proper 10:1 mix ratio and mix. Hand mixing is not recommended and may result in unpredictable results.
1) Apply adhesive to clean, dry substrates, which are free of loose paint, oxide films, oils, dust, mold release agents and all other surface contaminants. See the Surface Preparation section for specific substrate preparation methods.
45 ml Cartridge:
Place duo-pak cartridge in EPX applicator. Twist to remove cap. Dispense and discard a small amount of adhesive to assure even ratio and free flow. Clear orifice if necessary. Use only orange 10:1 mixing nozzle by: (a) aligning nozzle onto cartridge tip, and (b) twist the gray nut into place. Dispense and discard a small amount of adhesive through nozzle until the adhesive is mixed.
490 ml Cartridge:
While holding duo-pak cartridge in an upright position, unscrew the plastic nut and remove and discard the cartridge plug. Place cartridge in a 10:1, 490 ml EPX applicator.
Clean orifice if clogged; dispense and discard a small amount of adhesive to even pistons. Attach 10:1 EPX mixing nozzle by:
(a) sliding the nozzle onto the cartridge orifice;
(b) screwing the plastic nut back onto the cartridge to secure the nozzle. Dispense and discard a small amount of adhesive until the mixed adhesive has a milky white appearance. If adhesive is clear, check the small orifice for debris or flow.
Meter-Mix Equipment:
Follow manufacturer's precautions, directions for use, and recommendations.
2) After the adhesive is applied, substrates must be mated within the worklife of the adhesive, 2-2.5 minutes or sooner for one-sided applications. Adhesive thickness less than .005" will yield unpredictable results. The joint design of the substrates should facilitate a .005" to .008" adhesive thickness at the bondline. Adhesive contains .008" microperes for this purpose.
3) The bonded surfaces should be fixtured, or clamped, for at least 2 hours. The clamping pressure should be sufficient to keep the surfaces in contact during cure (typically 4-8 psi). Plastic parts can be designed to be self-fixturing, negating the need for external fixturing.
Note: Heating the bondline to 150-175°F (66-80°C) for 30 minutes will speed up curing. The parts should be dwelled for a minimum of 10 minutes at room temperature prior to heating to allow more adhesive penetration into the substrates before heat-accelerated cure.
4) Cured adhesive appearance: the adhesive will yellow with time; a rippling effect in the adhesive as it cures is normal and indicates that the adhesive is mixed properly and curing normally.

Approximate Coverage – By Size of Container [Figures do not include nozzle waste]

Bead Size	Linear ft per 45 ml	Linear ft per 490 ml	Linear ft per mixed gallon
1/2"	2.4	26	196
3/8"	4.5	45	350
1/4"	10.5	102	785
1/8"	37.2	405	3,130
1/16"	147.7	1600	12,240

Coverage in square feet – (.008" bond line) [Figures do not include nozzle waste]

Square ft per 45 ml	Square ft per 490 ml	Square ft per mixed gallon
2.5	49	200

Handling/Application Information (continued)

Surface Preparation

3M™ Scotch-Weld™ Structural Plastic Adhesive DP8005 can bond polypropylene, polyethylene and other thermoplastic polyolefins without special surface preparation. However, all substrates should be clean, dry and free of paint, oxide films, oils, dust, mold release agents and other surface contaminants. The amount of surface preparation directly depends on the bond strength and environmental resistance desired by the user.
The following cleaning methods are suggested for common surfaces.
Steel and Aluminum
1) Wipe free of dust with oil-free solvent such as acetone or isopropyl alcohol.
2) Sandblast or abrade using clean fine grit abrasives (150 grit or finer).
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 (or see instructions pertinent to a specific primer).
Note: Aluminum may also be acid etched. Follow the manufacturer's precautions and directions for this procedure.
Plastic/Rubber
1) Wipe with isopropyl alcohol.*
2) Abrade using fine grit abrasives (150 grit or finer).
3) Remove residue by wiping again with isopropyl alcohol.*
4) Allow solvent to evaporate before use.
Thermoplastic Polyolefin (TPO)
1) Wipe with isopropyl alcohol.*
2) Allow solvent to evaporate before use.
Glass
1) Solvent wipe surface using acetone or isopropyl alcohol.*
2) Allow solvent to evaporate before use.
*Note: When using solvents, be sure to extinguish all ignition sources and follow the manufacturer's precautions and directions for use.

Storage and Shelf Life

For maximum shelf life, store duo-pak cartridges and bulk containers at 40°F (4°C) or below.
When stored at the recommended temperatures in the original unopened containers, this product has a shelf life of 18 months from date of manufacture.

Trademarks

References

Property	Values
3m.com Product Page	https://www.3m.com/3M/en_US/company-us/all-3m-products/~/3M-Scotch-Weld-Structural-Plastic-Adhesive-DP8005/?N=5002385+3293241357&rt=rud
Safety Data Sheet (SDS)	https://www.3m.com/3M/en_US/company-us/SDS-search/results/?gsaAction=msdsSRA&msdsLocale=en_US&co=ptn&q=DP8005 Off White

Family Group

	DP8005 Off White	DP8005 Black
Color Test Name: Cured	Yellow	Black

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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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