TBP Converting, Inc.
3M DP8010, DP8010NS PDS

TBP Converting, Inc. 400 Thoms Drive Suite 411, Phoenixville, PA 19460 Toll: 800-850-3338 Fax: 610-933-4710
www.tbpconverting.com

Scotch-Weld™ Structural Plastic Adhesives DP8010 Blue • DP8010NS Blue

Technical Data Sheet **October 2018**

Product Description

3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010 Blue and DP8010NS Blue are two-part, acrylic-based adhesives (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.*

These adhesives can replace screws, rivets, plastic welding, and two-step processes which include chemical etchants, priming or surface treatments in many applications.

Features

- Ability to structurally bond polyolefins without special surface preparation
- Regular and Non-Sag Formulations
- Excellent water and humidity resistance
- One step process; no pre-treatment of polyolefin substrates necessary
- Convenient hand-held applicator
- Ability to bond dissimilar Substrates
- Room temperature cure
- Very good chemical resistance
- Solvent-free adhesive system
- Available in bulk

Typical Uncured Properties

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Unless otherwise indicated, all properties measured at 72°F (22°C).

Property		3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010 Blue	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010NS Blue
Color	Base (B)	Blue-Green	
	Accelerator (A)	Clear and nearly colorless	
Viscosity[1]	Base (B)	27,000 cP	64,000 cP
	Accelerator (A)	17,000 – 40,000 cP	17,000 – 40,000 cP
Density	Base (B)	8.5 lb/gal	
	Accelerator (A)	8.3 – 8.7 lb/gal	
Mix ratio	By volume	10:1	
	By weight	10:1	
Work life[2]		Approx. 8 minutes	
Open time[3]		10 minutes	
Skin Time[4]		Approximately 3 minutes (See Below)	
Time to handling strength[5]		60 minutes	

1. Viscosity measured using Brookfield RTV, spindle #7, 20 RPM @ 80°F (27°C)
2. Maximum time that adhesive can remain in a static mixing nozzle and still be expelled without undue force on the applicator.
3. Maximum time allowed after applying adhesive to one substrate before bond must be closed and fixed in place.
4. An open bead line will show some skinning in approximately 3 minutes. It is possible to bond parts with good strength if the parts are made within 10 minutes. Therefore, the adhesive has a 10 minute open time for making bonds.
5. Minimum time required to achieve 50 psi of overlap shear strength, measured on HDPE

Note: The data in this 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.

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Typical Mixed Properties

Property	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010 Blue	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010 Blue
Color	Blue-Green	
Full cure time	24 hours	
Dispense Viscosity (73°F)	25,000 cP	64,000 cP

Typical Cured Physical Properties

Property		3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010 Blue
Physical Shore D Hardness Storage Modulus (DMA) Tensile Strength (ASTM D638) Tensile Modulus (ASTM D638) Strain at Break (ASTM D638)		55-60 970 MPa 1300 PSI 77,000 PSI 90%
Thermal Tg (Glass Transition Temperature) Coefficient of Thermal Expansion (in/in/°C)	(DMA) Below Tg Above Tg	61°C 116 245
Electrical Dielectric Strength (ASTM D 149) Volume Resistivity ((ASTM D 257) Surface Resistivity (ASTM D257) Dielectric Constant (ASTM D150) Dissipation Factor (ASTM D150)		603 V/mil 4.10E+11 (Ω-cm) 8.00E+10 (Ω) 4.36 at 1 KHz 0.068 at 1 KHz

Typical Cured Physcial Properties ***(continued)***

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

Overlap Shear (psi)[7], ASTM D1002

Substrate	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010 Blue	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010NS Blue
Aluminum (MEK/abrade/MEK)	1960 CF	1780 CF
Cold-rolled steel (MEK/abrade/MEK)	1800 CF	1870 CF
Stainless Steel (MEK/abrade/MEK)	1820 CF	1990 CF
Copper (MEK/abrade/MEK)	1870 CF	1500 CF
Galvanized steel (MEK/abrade/MEK)	1330 CF	840 mixed
PP (IPA wipe)	1150 SF	1150 SF
LDPE (IPA wipe)	360 SF	360 SF
HDPE (IPA wipe)	1040 SF	1100 SF
UHMW-PE (IPA wipe)	770 CF	750 SF
Gelcoat (fiberglass--smooth side)	900 SF	1100 SF
Acrylic	1100 SF	1190 SF
PVC	1730 SF	1740 SF
PC	760 AF	740 AF
ABS	1250 SF	1240 SF
Polystyrene (HIPS)	580 SF	570 SF
FRP (Epoxy)	2830 CF	2860 CF
Acetal	90 AF	70 AF
SMC (Fiberglass--rough side)	760 SF	800 SF
Glass	530 SF	670 SF
PTFE (IPA/abrade/IPA)	320 AF	360 AF

Overlap Shear (psi); Etched Aluminum, at Temperature[7], ASTM D1002

Temperature	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010 Blue	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010NS Blue
-20°F (-29°C)	2000 mixed	2000 mixed
73°F (23°C)	1800 CF	1700 CF
120°F (49°C)	1000 mixed	700 mixed
150°F (66°C)	450 AF	340 AF
180°F (82°C)	300 AF	100 AF

6. Overlap shear values measured using ASTM D1002; adhesives allowed to cure for 7 days at room temperature; ½" overlap; 0.010" bond line thickness; samples pulled at 0.1 in/min for metals and 2 in/min for plastics; all surfaces prepared with light abrasion and solvent clean; substrates used were 1/16" thick aluminum and 1/8" thick plastics; failure modes: AF: adhesive failure CF: cohesive failure SF: substrate failure mixed: AF/CF

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Typical Cured Physcial Properties *(continued)*

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Environmental Resistance[8] Expressed as Percent Retention of Control Strength (Measured on 1/8" thick HDPE via Overlap Shear, ASTM D1002)

Condition	Substrate	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010 Blue	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010NS Blue
Control	HDPE	100% SF	100 % SF
160°F water soak		80% CF	80% CF
150°F/80% RH		95% CF	97% CF
NaOH 10% by wt		100% SF/CF	100% SF
HCl 16% by volume		100% SF	100% SF/CF
IPA soak		95% CF	91% CF
Diesel Fuel soak		97% SF/CF	93% SF
50% Antifreeze soak		100% SF/CF	100% SF
Gasoline soak		70% CF	70% CF
Acetone soak		20% AF	25% AF

8. Values indicate overlap shear test performance retained after 14 days of continuous exposure relative to a control sample left at room temperature; samples conditioned for 7 days at room temperature and 50% relative humidity prior to tests.

Floating Roller Peel (lb/inch width)[9] ASTM D3167

Substrate	3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010 Blue and 3M™ Scotch-Weld™ Structural Plastic Adhesive DP8010NS Blue
HDPE	Substrate Failure

[9] Floating roller peel values measured using ASTM D3167; allowed to cure for 24 hours at room temperature; 1" wide samples; 0.017" bond line thickness; samples pulled at 20 in/min. Flexible HDPE was 1mm thick and rigid HDPE was 4.8mm thick.

AF: adhesive failure CF: cohesive failure SF: substrate failure

Directions For Use

1. To obtain the highest strength structural bonds, paint, oxide films, oils, dust, mold release agents, and all other surface contaminants must be completely removed. The amount of surface preparation depends on the required bond strength and environmental aging resistance desired by user. For suggested surface preparations on common substrates, see the section on surface preparation.
2. Mixing
   For Duo-Pak Cartridges
   Store cartridges with cap end up to allow any air bubbles to rise towards the tip. To use, simply insert the cartridge into the EPX applicator and start the plunger into the cylinders using light pressure on the trigger. Then remove the cap and expel a small amount of adhesive to ensure material flows freely from both sides of cartridge. For automatic mixing, attach an EPX mixing nozzle to the cartridge and begin dispensing the adhesive. For hand mixing, expel the desired amount of adhesive and mix thoroughly. Mix approximately 15 seconds after obtaining a uniform color.

For Bulk Containers

Directions For Use *(continued)*

Mix thoroughly by weight or volume in the proportion specified on the product label or in the typical uncured properties section. Mix approximately 15 seconds after obtaining a uniform color.

3. Apply adhesive and join surfaces within the open time listed for the specific product. Larger quantities and/or higher temperatures will reduce this working time.
4. Allow adhesive to cure at 60°F (16°C) or above until completely firm. Applying heat up to 150°F (66°C) will increase cure speed.
5. Keep parts from moving during cure. Apply contact pressure or fixture in place if necessary. Optimum bond line thickness ranges from 0.005 to 0.020 inch; shear strength will be maximized with thinner bond lines, while peel strength reaches a maximum with thicker bond lines.
6. Excess uncured adhesive can be cleaned up with ketone type solvents.*

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

Surface Preparation

3M™ Scotch-Weld™ Structural Plastic Adhesives are designed to be used on metal, wood, and most plastic surfaces. The following cleaning methods are suggested for common surfaces:

Steel:
1. Wipe free of dust and dirt with pure solvent such as acetone or isopropyl alcohol.*
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with clean solvent to remove loose particles.*

Aluminum:
1. Wipe free of dust and dirt with pure solvent such as acetone or isopropyl alcohol.*
2. Sandblast or abrade using clean fine grit abrasives.
3. Wipe again with clean solvent to remove loose particles.*
4. When using a primer, apply adhesive within 4 hours of primer application.

Plastics/Rubbers:
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.*
2. Apply a thin coating of a silane adhesion promoter to the glass surfaces to be bonded and allow to dry completely before bonding.

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

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Storage	Store product at 40°F (4°C). Do not freeze. Allow product to reach room temperature prior to use.
Shelf Life	3M™ Scotch-Weld™ Structural Plastic Adhesives when stored in unopened original containers kept at recommended storage conditions have a shelf life of 3 months for 55 gal. drums, 9 months for 5 gal. pails and 18 months in duo-pak
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.
For Additional Information	To request additional product information or to arrange for sales assistance, call toll free 1-800-362-3550 or visit www.3M.com/structuraladhesives.
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This Industrial Adhesives and Tapes Division product was manufactured under a 3M quality system registered to ISO 9001 standards.

3M
Industrial Adhesives and Tapes Division
3M Center, Building 225-3S-06
St. Paul, MN 55144-1000
800-362-3550 • 877-369-2923 (Fax)
www.3M.com/structuraladhesives