



Scotch-Weld™

Hi-Strength Cylinder Spray Adhesives

90 • 92 • 94 CA

Technical Data

February, 2007

Product Description 3M™ Scotch-Weld™ Hi-Strength Cylinder Spray Adhesives are industrial grade, high performance bulk spray adhesives formulated for high strength and high heat resistant bonds. The adhesive is packaged in convenient, portable, no maintenance aerosol cylinders.

- Key Features**
- High solids, high coverage adhesive.
 - Fast drying formulas to help speed assembly.
 - High heat and moisture resistance to help protect bonds.
 - Permanent bonds on substrates like fabrics, soft foams, heavy papers, wood, metal, glass and most plastics.
 - HAPS free and MACT compliant.

Typical 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™ Hi-Strength Cylinder Spray Adhesives					
	90		92		94 CA	
Base:	Synthetic Elastomer		Synthetic Elastomer		Synthetic Elastomer	
Solids Content of Adhesive – propellant removed (by wt.):	23%		34.4%		28%	
Solids Content – aerosol (by wt.):	13%		23%		28%	
Color(s):	Clear		Clear, Red		Clear, Red	
Volatile Organic Compounds (VOC):	571 g/L		654 g/L		79 g/L	
Hazardous Air Pollutants (HAPS) % wt. (calculated):	0%		0%		0%	
SCAQMD Rule 1168 Compliant Contact Adhesive:	No		No		Yes	
MACT Compliant:	Yes		Yes		Yes	
Flammability:	Solvent	Propellant	Solvent	Propellant	Solvent	Propellant
	Yes	Yes	Yes	Yes	Yes	Yes

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Available Sizes and Expected Coverage

3M™ Scotch-Weld™ Hi-Strength Cylinder Spray Adhesives	Cylinder Size Availability	Cylinder Adhesive Net. Wt. (lbs.)	Sq. Ft. Coverage per Wet lb. of Adh @ 1 gm./sq. ft. (dry wt.):	Sq. Ft. Coverage @ 1 gm./sq. ft. (dry wt.):	Sq. Ft. Coverage @ 2.5 gms./sq. ft. (dry wt.):
90	Small - Returnable	15.6	59	921	368
	Large - Returnable	28.8	59	1,700	680
92	Large - Disposable	29.3	104	3,060	1,224
	Intermediate - Returnable	139	104	14,514	5,806
	Jumbo - Returnable	279	104	29,133	11,653
94 CA	Mini - Disposable	7.6	127	966	386
	Large - Disposable	26.2	127	3,331	1,332
	Intermediate - Returnable	128	127	16,271	6,509
	Jumbo - Returnable	266	127	33,814	13,526

Handling/Application Information

Surface Preparation:

For best results, all surfaces to be bonded must be clean, dry and free from dirt, dust, oil, loose paint, wax or grease, etc.

Application Temperature:

For best results, the temperature of the adhesive and the surfaces being bonded should be between 60°-80°F (16°-27°C). Temperatures outside this range may affect the bonding range and sprayability.

Equipment Set-Up:

Attach the larger flare fitting end to the spray applicator and tighten the nut securely. Check to see that the applicator gun trigger stop/adjusting nut is fully locked against the trigger. Attach the other end of the hose, a smaller flare fitting, to the cylinder valve and tighten securely.

Directions For Use:

- 1.) Slowly open the cylinder valve and inspect the connections for any leaks. Tighten if needed.
- 2.) Fully open the valve.
- 3.) Unscrew the trigger stop/adjusting nut away from the trigger 3-4 turns and spray a test pattern. For more adhesive output, continue to screw the nut away from the trigger. For less adhesive output, screw the nut back towards the trigger.
- 4.) Hold the applicator 3-10 inches away from the surface to be sprayed and apply a uniform coat of adhesive. (The smaller the spray pattern chosen in step 3 the closer the applicator gun will need to be to the surface and vice versa for larger patterns.)
- 5.) Apply 1-3 even coats of adhesive. (This will depend on the needed coverage for the bonding application.)
- 6.) Allow adhesive to dry until tacky and then apply sufficient pressure to ensure complete contact.

Note: Test the tackiness by gently touching the adhesive with your knuckle. If the adhesive transfers to your skin, it is too wet. If the adhesive is aggressively tacky and does not transfer to your skin, it is ready to bond. If the adhesive is too dry or only has a very light tack, it is too dry and another coat of adhesive should be applied to at least one of the surfaces.

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Handling/Application Information
(continued)

Product	3M™ Scotch-Weld™ Hi-Strength Cylinder Spray Adhesives				
	90		92		94 CA
Dry Time (minutes):	1-5		1-4		1-5
Open Time (minutes):	1-15		1-20		1-15
Suggested Nozzle(s):	9501	6501	9501	6501	4001

One Surface Bonding: Less demanding applications. Spray the more non-porous surface and bond within Open Time (see Open Times in above table). **Note: 3M™ Scotch-Weld™ Hi-Strength Cylinder Spray Adhesives 90 and 94 CA are not recommended for one surface bonding.**

Two Surface Bonding: Permanent, more demanding applications. Spray both surfaces and bond within Open Time (see Open Times in above table).

Equipment Shut Down: For storage – screw the trigger stop/adjusting nut all the way to the trigger lock position. Turn the valve on the cylinder to the closed position.

Application Equipment Suggestions for Cylinder

This Spray Adhesive Applicator Kit is specifically designed for use with 3M™ Cylinder Spray Adhesives.

Description	3M ID Number
3M™ Scotch-Weld™ Cylinder Adhesive Applicator (includes 9501 tip)	62-9880-9930-5
Scotch-Weld Cylinder Adhesive Applicator H (includes 4001 tip) – this applicator is for use with 3M™ Scotch-Weld™ Cylinders 94 and W99	62-9880-9950-3
Scotch-Weld Cylinder Adhesive 6 Foot Hose	62-9880-0006-3
Scotch-Weld Cylinder Adhesive 12 Foot Hose	62-9880-0012-1
Scotch-Weld Cylinder Adhesive 25 Foot Hose	62-9880-0025-3
Scotch-Weld Cylinder Adhesive 4001 Spray Tip	62-9880-4001-0
Scotch-Weld Cylinder Adhesive 6501 Spray Tip	62-9880-6501-7
Scotch-Weld Cylinder Adhesive 9501 Spray Tip	62-9880-9501-4
Scotch-Weld Cylinder Adhesive QSS Spray Tip – this nozzle is needed for 3M™ Scotch-Weld™ Cylinder 70	62-9880-8148-5
Scotch-Weld Cylinder Adhesive T-Fitting	62-9880-8348-1
Scotch-Weld Cylinder Adhesive Hose Swivel	62-9880-7948-9

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**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.

Overlap Shear Strength: 1 square inch bonds tested at 2 inches per minute separation rate at 75°F (24°).

Substrate Bonded	3M™ Scotch-Weld™ Hi-Strength Cylinder Spray Adhesives		
	90	92	94 CA
ABS to ABS (2 surface adhesive bond)	96	164	203
ABS to ABS (1 surface adhesive bond)	N/A	100	N/A
Acrylic to Acrylic (2 surface adhesive bond)	102	190	288
Aluminum to Aluminum (2 surface adhesive bond)	99	162	285
Birch to Birch (2 surface adhesive bond)	291	253	460
Birch to Birch (1 surface adhesive bond)	N/A	55	N/A
Galvanized to Galvanized (2 surface adhesive bond)	112	139	160
Galvanized to Galvanized (1 surface adhesive bond)	N/A	86	N/A
HPL to Particle Board (2 surface adhesive bond)	188	196	171
Polyethylene to Polyethylene (2 surface adhesive bond)	97	62	80
Polypropylene to Polypropylene (2 surface adhesive bond)	89	121	106
FRP (Fiber Reinforced Plastic) to FRP (2 surface adhesive bond)	108	161	258

Tensile Strength Failure Temperature: 2 square inch bonds tested with 30 grams hanging in tensile. Temperature is held for 10 minutes and ramped at 10°F increments, until complete failure.

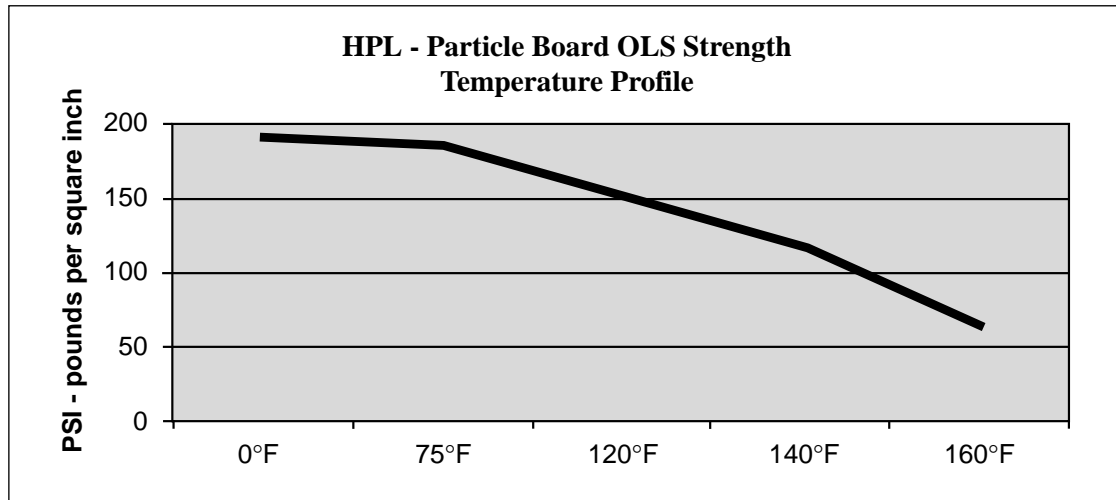
3M™ Scotch-Weld™ Hi-Strength Cylinder Spray Adhesives	Failure Temperature (°F)
90	250
92	240
94 CA	200

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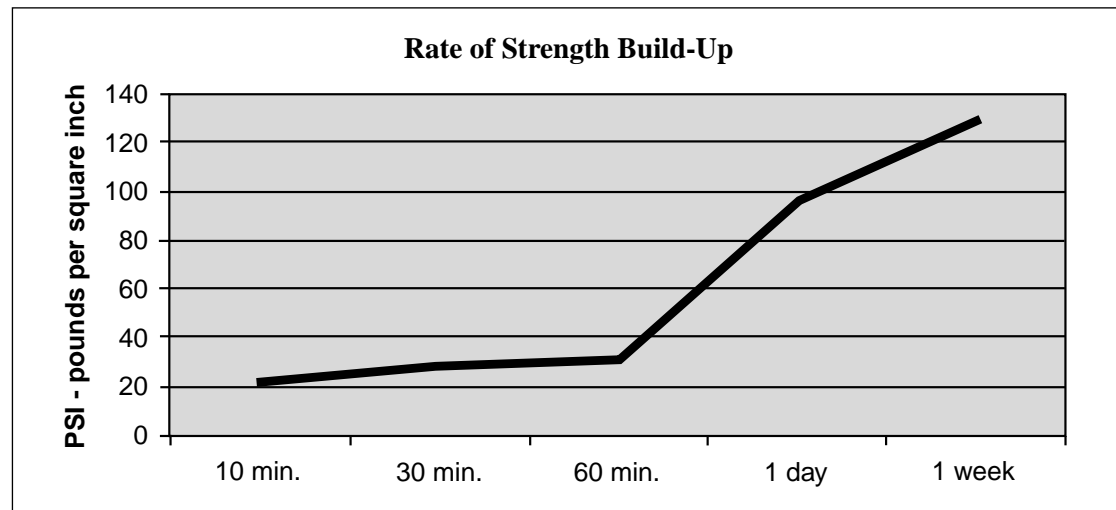
Typical Adhesive
 Performance
 Characteristics
 (continued)

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

Overlap Shear Strength: 1 square inch bonds tested at 2 inches per minute separation rate.



Tensile Strength: 1 square inch bonds tested at 12 inches per minute separation rate.



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Cold Weather Warning

How Cold Weather Affects Cylinders:

- 1.) The bulk adhesive in the cylinder will thicken as temperatures get colder.
- 2.) The propellants used will decrease in pressure and, therefore, effectiveness:
 - a. Liquefied hydrocarbon propellants will condense and reduce the effective amount of available pressure on the cylinder. This will adversely affect the spray pattern and, consequently, the overall performance of the adhesive.
 - b. Compressed gas propellants will shrink dramatically in cold weather causing the system to have much less available force to push a thicker bulk adhesive out. The effect will be improper, less controlled spray properties with longer dry times needed.

How to Eliminate Cold Weather Problems:

- 1.) Store the cylinders in a controlled environment with temperatures between 60°-80°F (16°-27°C).
- 2.) Keep cylinders off of cold concrete floors and away from outside walls.
- 3.) Use heat belts or blankets, approved for use with flammable adhesives, to control the temperature of the cylinders.
- 4.) Allow additional time for solvents and propellants to flash off, when temperatures are below 60°F (16°C).

If Cylinders Get Too Cold:

If cylinders arrive cold or have been exposed to temperatures that are causing poor spray properties, move to an area that is heated above 70°F (21°C). The larger the cylinder, the longer it will take for the temperature to equilibrate. Mini (~11 lb.) and Large (~30 lb.) cylinders can be shaken or submerged in hot water to accelerate the warming process. Once the cylinders equilibrate back to at least 60°F (16°C), the products will perform as normal.

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Trouble Shooting – Applicator/Hose Clog

Applicator – Hose Clog Checklist for 3M™ Scotch-Weld™ Hi-Strength Cylinder Spray Adhesives.

If the system sprays poorly or won't spray at all: The sequence below runs through a complete clog into the cylinder valve. If at any time during the sequence the problem is resolved, stop, clean the needed parts, put the system back together, and you are finished.

1. Make sure the cylinder is not empty.
2. Make sure the cylinder valve is open.
3. Close the applicator trigger stop adjusting nut and clean the nozzle tip. (Does it spray now?)
4. Take off the nozzle and try spraying. (Does it spray now?) Clean the nozzle.
5. Shut off the cylinder valve, CAREFULLY and SLOWLY – loosen the applicator gun/hose connection and look for adhesive to squirt out. If adhesive starts to leak out, allow it to slowly continue to do so until it stops. (This will be a little messy but you will need to bleed off the pressurized adhesive to clean the applicator gun.) The applicator gun has a clog at the valve, stem or inlet area and needs to be cleaned.
6. If nothing leaks out after fully loosening the applicator gun, CAREFULLY remove applicator gun, realizing that the hose may be clogged but could be full of adhesive and pressure depending on where the clog is. (Secure the open end of hose into a bucket in case the clog releases and the system flushes.)
7. CAREFULLY and SLOWLY loosen the hose connection at the cylinder valve. Look for adhesive to squirt out. If adhesive starts to leak out, allow it to slowly continue to do so until it stops. (This will be a little messy but you will need to bleed off the pressurized adhesive in the hose). Clean or replace the hose.
8. With everything now isolated from the cylinder, place a bucket in front of the cylinder valve and slowly open it to see if any adhesive comes out. If it does, put the cleaned system parts back together. If it does not, there is something wrong with the cylinder or cylinder valve and it should be returned.

**Solvents that can be used for cleaning nozzle, applicator gun and inside of hose:
3M™ Adhesive Remover Citrus Base, Cyclohexane, Toluene, MEK.***

***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 60°-80°F (16°-27°C) for maximum storage life. Higher temperatures reduce normal storage life. Lower temperatures may cause increased viscosity of a temporary nature. Rotate stock on a “first in-first out” basis.

Shelf Life When stored at the recommended conditions in the original, unopened container, this product has a shelf life of 15 months from date of shipment.

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.

Product Use All statements, technical information and recommendations contained in this document are based upon tests or experience that 3M believes are reliable. However, many factors beyond 3M's control can affect the use and performance of a 3M product in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the 3M product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

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