



Fuel Resistant Coatings

EC-776 • EC-776SR

Technical Data

November, 2004

Product Description

3M™ Fuel Resistant Coatings EC-776 and EC-776SR are general purpose, solvent-based adhesive/coatings with good adhesion to synthetic rubber, metal, glass, and many plastics. Fuel Resistant Coating EC-776SR includes a red dye for identification purposes.

Features

- Resists oil, gasoline, and aromatic fuels.
- Fuel Resistant Coating EC-776 meets the specification requirements of MIL-D-17951E sealing compound.
- Fuel Resistant Coating EC-776SR meets the specification requirements of MIL-S-4383C.

Note: Not recommended for use with alcohol containing fuels (gasohol) or jet fuel containing microbial organisms.

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	Fuel Resistant Coating EC-776	Fuel Resistant Coating EC-776SR
Base	Oil Resistant Elastomer	Oil Resistant Elastomer
Net Weight	7.3 lbs/gal	7.2 lbs/gal
Consistency	Thin Syrup	Thin Syrup
Solvent Blend	MIBK and Ethanol	MIBK
Flash Point (Closed Cup)	55°F (13°C)	73°F (23°C)
Viscosity	1500 ± 500 cps	1200 ± 800 cps
Color	Transparent Amber	Transparent Red
Solids Content (Approx.)	24% (by weight)	19% (by weight)
Brookfield Viscometer	RVF #2 spindle @ 20 rpm	RVF #2 spindle @ 10 rpm

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Handling/Application Information

Directions For Use:

3M™ Fuel Resistant Coatings EC-776 and EC-776SR may be applied by brush or flow applicator. When applying in multiple coats allow a minimum of 10 minutes between coats. Under normal atmospheric conditions this coating becomes tack free in about 20 minutes and should thoroughly dry in approximately 24 hours. Fuel Resistant Coatings EC-776 and EC-776SR are commonly used without heat cure. Heat curing Fuel Resistant Coatings EC-776 and EC-776SR for 1 hour at 250°F will increase moisture resistance of the coatings.

Coverage is approximately 320 square feet per gallon for a 1 mil dry film.

Surfaces to be coated should be clean, dry and free from oil or grease.

Fuel Resistant Coatings EC-776 and EC-776SR may also be used to coat tanks (aluminum or steel) by the fill and drain method. It is sometimes desirable to dilute Fuel Resistant Coatings EC-776 and EC-776SR with methyl ethyl ketone or solvent such as 3M™ Scotch-Grip™ Solvent No. 3 to assure proper run out or flow properties when using the fill and drain method.* An air hose inserted into the fuel tank can be used to help provide air circulation for proper drying.

Clean up can be accomplished with 3M™ Scotch-Grip™ Solvent No. 3. See 3M™ Scotch-Grip™ Solvent No. 3 Technical Data Sheet for additional technical information.

***Note: When using solvents, be sure to follow the manufacturer's precautions and directions for use for handling such materials.**

Application Equipment Suggestions

Note: Appropriate application equipment can enhance bonding film performance. We suggest the following equipment for the user's evaluation in light of the user's particular purpose and method of application

Pump – 2 to 1 ratio pump ball type check valves divorced design. Displacement of 5 cubic inches per cycle with 2" air motor.

Primer – None needed.

Accessories –

Hose – Low pressure hose Teflon® or nylon lined.

Flow Gun – Low pressure tip seal flow gun.

Note: All materials must be compatible with MIBK and MEK. Nylon and Teflon linings are compatible.

Reference Information

Material Temperature – 40°F (4°C) 1/8" dia. bead.

	Material Pressure psi	Output lb/min	Material Pressure psi	Output lb/min
Ten Foot Length 3/4" I.D. Hose	80	8.0	60	6.5
Twenty Foot Length 3/4" I.D. Hose	100	10.0	60	5.2
Twenty Foot Length 3/4" I.D. Hose	120	8.3	60	3.5
Ten Foot Length 1/2" I.D. Hose				
Twenty Foot Length 1/2" I.D. Hose	140	8.5	60	3.0
Ten Foot Length 1/2" I.D. Hose	100	7.0	60	3.0
Ten Foot Length 1/2" I.D. Hose	160	4.7	60	4.3
Ten Foot Length 1/4" I.D. Hose				

Note: Listed material pressure = operating air pressure x pump ratio.

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Typical Coating Performance Characteristics For 3M™ Fuel Resistant Coating EC-776

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

Resistance to Salt Water and Hydrocarbon Fluid: A 3" by 6" aluminum alloy panel coated with a 1-2 mil dry film was immersed for 7 days at 100°F (38°C) in a two layer liquid consisting of a 3% salt water solution and MIL-H-3136 Type III hydrocarbon test fluid. No softening, blistering, leaching, loss of adhesion of the coating or corrosion of the metal was in evidence when the panel was examined at the conclusion of the test.

Low Temperature Flexibility: Coated 1" x 6" x .032" aluminum surfaced aluminum alloy panels were immersed for 48 hours in MIL-H-3136 Type III hydrocarbon test fluid at 100°F. Upon removal from the test fluid they were subjected to a temperature of -65°F (-54°C) for 2 hours after which they were rapidly bent around a 3" mandrel at -65°F (-54°C). No cracking, checking or loss of adhesion was in evidence.

180° Peel Strength – Canvas/Steel (3M Test Method C-5H)

Time/Temp.	Value (piw)	Time/Temp.	Value (piw)
1 day at 75°F	2.5	2 weeks at R.T.	9.5
3 days at 75°F	4.5	3 weeks at R.T.	13.0
5 days at 75°F	8.0	—	—
7 days at 75°F	9.5	—	—

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Typical Coating Performance Characteristics For Fuel Resistant Coating EC-776SR

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

Note: All data contained herein have been obtained in the 3M Laboratories on production lots of 3M™ Fuel Resistant Coating EC-776SR. The procedures and tests conducted are contained in MIL-S-4383. Unless otherwise stated, the following data were obtained on Fuel Resistant Coating EC-776SR that had been dipcoated to a dry film thickness of 0.5-1.5 mils and dried 48 hours at 77 ± 2°F. and 50 ± 5% R.H.

Property	MIL-S-4383C Requirement	Results
Appearance	Clear uniform compound free of skins, lumps, and jelled or coarse particles.	Conforms
Color	Shall be colored red by use of an oil soluble dye.	Red (Conforms)
Solids Content (% by weight)	17-22	Conforms
Viscosity (cps) Brookfield, #2 spindle at 10 RPM	400-2000	Conforms
Drying, at 77 ± 2°F, and 50 ± 5% RH	A dipcoat shall air dry to a tack-free film in 4 hours (maximum).	Conforms
Accelerated Stability 14 days at 120°F plus 24 hours at RT	Viscosity shall not change more than ± 10% from the original viscosity. Shall not separate or gel.	Conforms No separation or gel.
Working Properties	Brush and dipcoats of the material shall be smooth, uniform, free of sagging, bubbles, pinholes, cracks and other film irregularities.	Conforms
Film Thickness	A single brush or dipcoat shall be within 0.5 to 1.5 mils when cured to maximum hardness.	Conforms
Recoating Properties	A dipcoat, when applied over a freshly dried film of topcoat material and also a cured film of sealing compound conforming to MIL-S-7502, shall show satisfactory bonding and no lifting, blistering, or loss of adhesion.	Conforms
Adhesion (piw) 72 hours dry at 77 ± 2°F 2°F and 50 ± 5% RH plus 24 hours at 120°F and immersed in Type III fuel (MIL-S-3136) for 48 hours at 77 ± 2°F.	5 (minimum) to metal. 10 (minimum) to MIL-S-7502 sealant.	8 15
Low Temperature Flexibility 48 hours immersion in Type III fuel at 120°F	Topcoat on metal and MIL-S-7502 sealant shall withstand a 2" radial bend test with no cracking, checking or loss of adhesion after 2 hours at -65°F.	Conforms

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Typical Coating Performance Characteristics For Fuel Resistant Coating EC-776SR (continued)

Property	MIL-S-4383C Requirement	Results
Resistance to Heat 48 hours immersion in Type II fuel at 120°F plus 24 hours air dry at RT plus 72 hour bake at 180°F.	Topcoat on metal and MIL-S-7502 sealant shall show no hardening, blistering, checking, cracking, shrinkage, or loss of adhesion or flexibility.	Conforms
Resistance to Salt Water and Hydrocarbons 20 days immersion in a three phase system of vapor/Type II fuel 3% aqueous sodium chloride solution at 120°F.	Shall show no softening, blistering, leaching, apparent corrosion of the metal or loss of adhesion.	Conforms
Resistance to Hot Oil 14 days immersion in MIL-L-6082, grade 1065 oil at 250°F.	Shall show no cracking, flaking or loss of adhesion.	Conforms
Fuel Contamination (milligrams/100 millimeters of fuel)	The non-volatile extractable materials contributed by the material in contact with the test fluid shall not exceed 20 milligrams per 100 milliliters. No more than slight discoloration shall be present on a polished copper strip.	Conforms (8 milligrams)
Shrinkage	A film of topcoat on cured MIL-S-7502 sealant, when applied and cured, shall show no tendency to crack or pull away.	Conforms
Sealing Compound Protection 100 days Type III fuel at 120°F with fuel change every 20 days of exposure.	The topcoated sealant shall show no appreciable leaching, change in hardness, flexibility or signs of cracking. The topcoat shall not crack, check, or delaminate.	Conforms

Storage and Handling

Store 3M™ Fuel Resistant Coatings EC-776 or EC-776SR at 60-80°F (15-27°C) for maximum storage life. Higher temperatures reduce normal storage life. Lower temperatures can increase viscosity temporarily. Rotate stock on a “first in-first out” basis.

Standard shelf life for Fuel Resistant Coating EC-776 is 12 months from date of shipment when stored at 60-80°F (15-27°C).

Standard shelf life for Fuel Resistant Coating EC-776SR is 6 months from date of shipment when stored at 60-80°F (15-27°C).

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Note

3M™ Fuel Resistant Coating EC-776 is identical to 3M™ Fuel Resistant Coating 776 in chemical composition. Fuel Resistant Coating EC-776 has been labeled, packaged, tested, and certified for aircraft and aerospace applications. Fuel Resistant Coating EC-776 may be used for aircraft and aerospace applications if proper Certificates of Test have been issued and material meets all specification requirements.

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 (800) 235-2376. Address correspondence to: 3M Aerospace and Aircraft Maintenance Division, 3M Center, Building 223-1N-14, St. Paul, MN 55144. If you are outside of the U.S., please contact your nearest 3M office or branch.

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If the 3M product is proved to be defective, THE EXCLUSIVE REMEDY, AT 3M'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF OR TO REPAIR OR REPLACE THE DEFECTIVE 3M PRODUCT. 3M shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including, but not limited to, contract, negligence, warranty, or strict liability.

AS 9100

This product was manufactured under a 3M quality system registered to AS9100 standards.



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