



# Fuel Resistant Coatings

## EC-776 • EC-776SR

Technical Datasheet

July 2011

### 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. 3M EC-776SR Coating includes a red dye for identification purposes.

### Features

- Resists oil, gasoline, and aromatic fuels.
- 3M EC-776 Coating meets the specification requirements of MIL-D-17951E sealing compound.
- 3M EC-776SR Coating 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	3M™ Fuel Resistant Coating EC-776	3M™ 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. 3M EC-776 and EC-776SR Coatings are commonly used without heat cure. Heat curing 3M EC-776 and EC-776SR Coatings 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.

3M EC-776 and EC-776SR Coatings may also be used to coat tanks (aluminum or steel) by the fill and drain method. It is sometimes desirable to dilute 3M EC-776 and EC-776SR Coatings with methyl ethyl ketone (MEK) 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 MEK.

**\*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, fluorinated plastic or nylon lined.

**Flow Gun** – Low pressure tip seal flow gun.

**Note:** All materials must be compatible with MIBK and MEK. Nylon and fluorinated plastic 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)**

<b>Time/Temp.</b>	<b>Value (piw)</b>	<b>Time/Temp.</b>	<b>Value (piw)</b>
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 3M™ 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 3M EC-776SR Coating 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
<b>Appearance</b>	Clear uniform compound free of skins, lumps, and jelled or coarse particles.	Conforms
<b>Color</b>	Shall be colored red by use of an oil soluble dye.	Red (Conforms)
<b>Solids Content</b> (% by weight)	17-22	Conforms
<b>Viscosity (cps)</b> Brookfield, #2 spindle at 10 RPM	400-2000	Conforms
<b>Drying, at</b> 77 ± 2°F, and 50 ± 5% RH	A dipcoat shall air dry to a tack-free film in 4 hours (maximum).	Conforms
<b>Accelerated Stability</b> 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.
<b>Working Properties</b>	Brush and dipcoats of the material shall be smooth, uniform, free of sagging, bubbles, pinholes, cracks and other film irregularities.	Conforms
<b>Film Thickness</b>	A single brush or dipcoat shall be within 0.5 to 1.5 mils when cured to maximum hardness.	Conforms
<b>Recoating Properties</b>	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
<b>Adhesion (piw)</b> 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
<b>Low Temperature Flexibility</b> 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 3M™ Fuel Resistant Coating EC-776SR (continued)**

Property	MIL-S-4383C Requirement	Results
<b>Resistance to Heat</b> 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
<b>Resistance to Salt Water and Hydrocarbons</b> 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
<b>Resistance to Hot Oil</b> 14 days immersion in MIL-L-6082, grade 1065 oil at 250°F.	Shall show no cracking, flaking or loss of adhesion.	Conforms
<b>Fuel Contamination</b> (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)
<b>Shrinkage</b>	A film of topcoat on cured MIL-S-7502 sealant, when applied and cured, shall show no tendency to crack or pull away.	Conforms
<b>Sealing Compound Protection</b> 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 3M EC-776 Coating is 12 months from date of shipment when stored at 60-80°F (15-27°C).

Standard shelf life for 3M EC-776SR Coating is 6 months from date of shipment when stored at 60-80°F (15-27°C).

**Note**

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

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### 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, please visit [www.3M.com/msds](http://www.3M.com/msds) or call 1-800-364-3577 or (651) 737-6501.

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### For Additional Information

In the U.S., call toll free 1-800-235-2376, or fax 1-800-435-3082 or 651-737-2171. For U.S. Military, call 1-866-556-5714. If you are outside of the U.S., please contact your nearest 3M office or one of the following branches:

<b>Australia</b> 61-2-498-9711 tel 61-2-498-9710 fax	<b>Austria</b> 01-86686-298 tel 01-86686-229 fax	<b>Brazil</b> 55 19 3838-7876 tel 55 19 3838-6892 fax	<b>Canada</b> 800-410-6880 ext. 6018 tel 800-263-3489 fax
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### Technical Information

The technical information, recommendations and other statements contained in this document are based upon tests or experience that 3M believes are reliable, but the accuracy or completeness of such information is not guaranteed.

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### Product Use

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. Given the variety of factors that can affect the use and performance of a 3M product, user is solely responsible for evaluating the 3M product and determining whether it is fit for a particular purpose and suitable for user's method of application.

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### Limitation of Liability

Except where prohibited by law, 3M will not be liable for any loss or damage arising from the 3M product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

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These products were manufactured under a 3M Quality Management System registered to the AS9100 standard.



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