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3M Advanced Materials Division

3M™ Stain Resistant Additive SRC-220

Introduction

3M™ Stain Resistant Additive SRC-220 is an aqueous fluorinated polyurethane dispersion (PUD) that, when formulated as a penetrating sealer, adds stain resistance, release, and water and oil repellency characteristics to porous surfaces. The SRC-220 concentrate can also be used as an additive to many general coating formulations and to various construction materials. This product is suitable for both indoor and outdoor use.

Suggested Applications

SRC-220 additive can be diluted using water, water-miscible solvents (such as alcohols, ketones, ethylene glycol monobutyl ether, dipropylene glycol monomethyl ether and other glycol mono- or di- ethers) and water-solvent mixtures. When applied at a 2 to 5% concentration and used as a penetrating sealer, SRC-220 additive provides water and oil repellency and stain resistance to porous surfaces such as concrete, grout, unglazed tile, granite, clay, slate, limestone and terra cotta. The sealer is easily applied, dries quickly, is durable and causes no significant change to the appearance of the treated surface. Laboratory tests show that repellency and stain resistance improve when SRC-220 additive is diluted with a water-miscible solvent or a water/solvent mixture, as compared to dilution with water only.

Typical Physical Properties (Not for specification purposes)

Property	SRC-220
Appearance	Slightly translucent solution
Percent active (weight %)	15%
Viscosity	<30 cps
Density	1.1 g/ml
VOC (ASTM 3960-89)	< 240 g/l
pH	7 – 8
Boiling point	100° C
Vapor pressure @ 20° C	18 mmHg
Evaporation Rate	1, Water = 1
Flash Point	>93.3° C
Stability	Minimum one year from date of manufacture under normal storage conditions. Bring to room temperature and stir before using.
Solvent	DPM (5%) and water (80%)

All values determined at 77°F (25°C) unless otherwise specified.

Note: When using solvents or other chemicals, be sure to read and follow the manufacturer's precautions and directions for use before using.

SRC-220 additive can also be used as a stain resistant additive to a variety of acrylic and urethane based coatings at 0.2 to 1.0% active solid levels, to improve the water and oil repellency. Additionally, SRC-220 additive can be incorporated into construction materials, such as caulk or putty, to improve the stain resistance and release characteristics of these materials.

Note: SRC-220 additive is not compatible with xylene, mineral spirits and other non-polar hydrocarbons.

As a Penetrating Sealer for Concrete, Porous Stone and Pavers

SRC-220 concentrate was diluted to 4% solids in water, to 3% solids in ethylene glycol monobutyl ether (EGBE or 2-butoxyethanol) and to 3% solids in a 9:1 water/EGBE solution. These blends were compared to a leading water-based fluorochemical tile sealer and to a solvent-based silicone sealer. Each sealer was applied to Limestone tile and Mexican Saltillo tile (two coats for each sealer) and allowed to dry for 24 hours. A variety of stain-causing materials were applied to the treated surfaces. The materials were allowed to stand for 24 hours; the tiles were

washed with water, sponged and allowed to dry. The location on each of the tiles where the stain-causing materials were placed was then rated using the scale shown below. The performance ratings for Limestone and Mexican Saltillo are shown in Tables 1 and 2, respectively. The results showed that SRC-220 additive in water provided comparable stain resistance and stain release to a leading fluorochemical tile sealer. The addition of a small amount of solvent, such as EGBE, improves the water repellency, oil repellency and stain resistant performance of SRC-220 additive, as compared to a leading fluorochemical sealer.

Note: SRC-220 additive can be added to formulations designed to enhance the cure of newly placed concrete. Testing formulations using accepted industry acrylic resins have shown that adding SRC-220 Stain Resistant Additive can provide post-curing stain resistance. See your 3M representative for additional information.

Rating	Description
0	No Stain
1	Very Light Stain
2	Light Stain
3	Moderate Stain
4	Heavy Stain
5	Stain Penetrated Within One Hour

As an Additive to Coatings and Sealers

SRC-220 concentrate was added to a number of commercially available coating and sealer products at 1.0% active solids. The coatings containing SRC-220 additive were then coated on the surfaces intended for the original product and allowed to dry for three days. Advancing water and hexadecane contact angles were measured. The results in Table 3 show that with 1.0% SRC-220 additive, higher advancing water and hexadecane contact angles are achieved, therefore exhibiting improved water and oil repellency. It is recommended that a 0.2 to 1.0% active solids level of SRC-220 additive be used.

Table 1: Stain Resistance Results for Limestone

(Not for specification purposes)

	4% SRC-220 in Water	3% SRC-220 in EGBE	3% SRC-220 in Water-EGBE Blend	Commercial Fluorochemical Sealer in Water	Silicone Sealer in Solvent	Control-Not Sealed
Cooking Oil	0	0	0	0	4	5
Coffee	1	0	1	1	2	4
Grape Juice	1	0	1	1	2	5
Cola	1	0	0	0	3	4
Red Wine	1	1	1	2	3	5
Soy Sauce	0	0	0	0	2	5
Dirty Motor Oil	0	0	0	0	4	5
Brake Fluid	2	1	1	0	4	5
Anti-freeze	1	0	0	3	3	5
Transmission Fluid	1	0	0	0	4	5
Total Stain Score*	**8**	**2**	**4**	**7**	**31**	**48**

Table 2: Stain Resistance Results for Mexican Saltillo

(Not for specification purposes)

	4% SRC-220 in Water	3% SRC-220 in EGBE	3% SRC-220 in Water-EGBE Blend	Commercial Fluorochemical Sealer in Water	Silicone Sealer in Solvent	Control-Not Sealed
Cooking Oil	0	0	1	1	4	5
Coffee	1	1	1	2	3	5
Cola	1	0	0	1	3	4
Red Wine	2	1	1	3	3	5
Soy Sauce	0	0	0	2	2	5
Dirty Motor Oil	2	1	1	2	5	5
Anti-freeze	1	1	1	1	3	5
Transmission Fluid	2	1	1	2	4	5
Total Stain Score*	**9**	**5**	**6**	**14**	**27**	**39**

* Lower stain score indicates greater stain resistance.

Stain resistance on certain other stone substrates is available on request.

Table 3: Contact Angle Improvement with SRC-220 Addition

(Not for specification purposes)

Coating Formulation	Advancing Water Contact Angle	Advancing Hexadecane Contact Angle
Urethane floor coating A	76.6	24.4
Product A + 1.0% Solids SRC-220	97.2	67.3
Two Parts Epoxy Coating B	67.0	28.3
Product B + 1.0% Solids SRC-220	106.6	73.3
Clear Wood Finish C	93.3	Too low to measure
Product C + 1.0% Solids SRC-220	117.6	79.3

Formulation Information

Water, water-miscible solvents or water-solvent mixtures should be added to concentrated SRC-220 additive with agitation to create the required active solid level. Surfactants and defoamers can be added to the formulation, but are normally not required. SRC-220 additive can be added to many coating formulations; however, the user should test each formulation for compatibility before using.

3M™ Stain Resistant Additive SRC-220 Storage

SRC-220 additive is stable after limited freezing and thawing. Repeated freezing and thawing should be avoided. The shelf life of the product is one year from date of manufacture under normal storage conditions. SRC-220 additive is classified as “non-hazardous and non-flammable” by the U.S. Department of Transportation.

Regulatory Summary

The volatile organic compound (VOC) content of SRC-220 is only 5% DPM.

3M has been a leader in developing next generation surface protection materials with performance and environmental advantages. SRC-220 additive is based upon stable polymers and is not bioaccumulative.

The components of SRC-220 additive are in compliance with the chemical notification requirements of TSCA.

Product Safety and Handling

SRC-220 additive is intended for use in contained and non-dispersive applications. Before using this product, read the product label and Safety Data Sheet (SDS) and follow all precautions and directions for use.

3M does not recommend this product for use in food contact applications or applications involving repeated exposure of wet material through skin contact, inhalation or ingestion. It is not intended for medical or pharmaceutical applications. Neither 3M nor the U.S. Food and Drug Administration has evaluated or reviewed this product for such applications.

It is the user’s responsibility to determine whether this product is durable and properly cured for the end use.

Incinerate in an industrial or commercial facility in the presence of a combustible material. Combustion products will include hydrofluoric acid (HF). Facility must be able to handle halogenated materials. As a disposal alternative, dispose of waste product in a facility permitted to accept chemical waste.

For additional information about safety, handling, and disposal, see the product Safety Data Sheet.

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