



TOP FLUOROCHEM
CO., LTD

Fabric Application Sheet

SP160

PFOA-Free Water and Oil Repellent (WOR)

Fabric Protectant

Revised March 27, 2009

Fabric Types

SP160 is particularly well suited for polyester, nylon, cotton, and wool fabrics.

Methods

SP160 can be applied in spray, foam, knife-coat, kiss roll, exhaust, or traditional padding applications. Pad application (also known as dip/nip) is the most common application method. Worker care must be taken not to inhale aerosolized SP160 during spray application (see Safety section).

Fabric Preparation

The goods must be free of all processing chemicals such as wetting agents, dyeing auxiliaries, sizing residues, softeners (especially silicones), and other surface-bound contaminants to obtain the highest durability. Total fabric extractables can be measured by AATCC 97 (solvent + water + enzyme) and must be less than or equal to 1.5% on weight of fabric for high durability. Fabric alkalinity also interferes with durability. Therefore, steps must be taken to ensure the fabric is acidic and contains low alkalinity, less than or equal to 0.05% as measured by the AATCC 144 test method.

Dilution

Dilution with soft (<100 ppm hardness) or deionized water is recommended. SP160 must be the last finishing component added to a diluted bath containing other auxiliaries such as wrinkle free resins, softeners, etc. When mixing the bath, do not mix so fast that air is pulled into the solution – this may cause foaming. Any pH adjustment should be performed with acetic acid or sodium acetate after the addition of SP160. Pad baths should be used within 12 hours of preparation.

Pad Bath Concentration

Typically, 10 – 70 g/L is used depending on the cleanliness of fabric, fabric structure/composition, and desired durability.

Fabric Application – Padding

Pad bath pH: 4 – 6

Fabric wet pickup (WPU): 60 – 80 %

Bath temperature: approximately 20 °C

Drying: 110 – 130 °C until fabric water content is < 7 % of weight of fabric (OWF)

Curing: 140 – 150 °C for 5 minutes or 160 – 170 °C for 60 seconds

Example Recipes

100 % Wrinkle Free Cotton Shirting

0.1 % Mykon® NRW-3 (Omnova) or other non-rewetting wetting agent

3 – 5 % SP160

1.5 % Ultratex® REP (Huntsman) or other fluoropolymer-compatible softener

9 % Sedgerez® PCR-2 (Omnova) or similar wrinkle free resin

pH 5 (adjust with acetic acid or sodium acetate)
 Pad onto fabric to ~ 60 % wet pickup
 Dry at 120 °C for 3 minutes
 Cure at 170 °C for 1 minute

100 % Polyester

0.1 % Mykon® NRW-3 (Omnova) or other non-rewetting wetting agent
 2 % SP160
 1.5% Mykosoft® 129 (Omnova) or other fluoropolymer-compatible softener
 0.5 % Zerostat® FC (Huntsman) or other compatible antistatic agent
 pH 5 (adjusted with acetic acid or sodium acetate)
 Pad onto fabric to ~ 60 % wet pickup
 Dry at 120 °C for 3 minutes
 Cure at 170 °C for 1 minute

Performance Testing

Water Repellency: Spray Test AATCC 22

Oil Repellency: Hydrocarbon Resistance Test AATCC 118

Aqueous Liquid Repellency: Water/Alcohol Solution Resistance Test AATCC 193

Home Laundering (HL) Procedure: Appearance of Fabrics after Repeated Home Laundries AATCC 124

Laboratory Results

Actual performance is a function of many factors. Like any other surface protection products, the performance and application should be tested prior to using on a large scale. Typical lab results using the example recipes above are presented below:

		Cotton	Polyester
0 HL	Water Repellency	100	100
	Oil Repellency	6	6
	Aqueous Liquid Repellency	8	8
10 HL	Water Repellency	100	100
	Oil Repellency	6	6
	Aqueous Liquid Repellency	8	8
20 HL	Water Repellency	100	80
	Oil Repellency	5	4
	Aqueous Liquid Repellency	8	6

The suggested recipes and data in this bulletin are based on our laboratory results. Users should perform their own tests to determine the suitability of these products for their own applications.

Safety

Gloves and eye protection must be worn to avoid skin and eye contact. If spraying the product, it is very important to not inhale mists of the product. Prolonged inhalation of all types of fluoropolymers, including textile water and oil repellents (WORS), may cause flu-like symptoms. For more information, please read the Material Safety Data Sheet.

Notes

Providing the end user with care guidelines will result in greater repellency performance and more satisfied end users. Washing with harsh soaps and high pH water (for example, industrial laundering) and silicone fabric softeners (very few consumer softeners are of the silicone type) should be avoided. The fabric must be dried well to reset the polymer on the surface after washing. If the fabric is air dried, quick ironing without starch will reset the polymer. If machine drying is used, the fabric should reach 60 °C as designated in AATCC 124.