



CHEMGUARD S-761PL

High Performance Anionic Fluorosurfactant for Paper Protection

Product Description

Chemguard S-761PL is a perfluoro-based anionic fluorosurfactant of the phosphate ester type. It provides surface tensions as low as 16 dynes/cm in water at very low concentrations. It also has excellent dynamic surface tension properties, allowing for rapid attainment of low equilibrium surface tensions. Chemguard S-761PL imparts excellent wetting and water and oil repellency for paper and paperboard products.

Attributes

- Provides low surface tension at low concentrations
- Excellent for wetting contaminated or difficult to coat surfaces
- Provides water and oil repellency to paper and paperboard products
- Ideal replacement for Dupont *Zonyl RP and NF
- Listed in the Code of Federal Regulations*, Food and Drugs, 21 CFR 176.170

Typical Properties¹

Appearance	Clear, colorless liquid	
Ionic Character	Anionic	
Percent Solids (Actives)	34%	
Diluent Composition	Water/Isopropanol	
Density (25°C)	1.1 g/ml	
Flash Point (Pensky-Martens, closed cup)	31°C	
pH	7-9	
Freezing Point	-15°C (5°F)	
Aqueous Surface Tension dynes/cm (mN/m), 25°C (77°F)	0.001% Solids	28
	0.01% Solids	17
	0.1% Solids	15.5
	CMC (critical micelle concentration)	0.014%

¹Not for specification purposes.

Typical Applications

Chemguard S-761PL is a dilute solution composed of 34% actives fluorosurfactant in a water and solvent miscible diluent. Typical uses include leveling and water and oil repellency for paper, floor polishes, paints and coatings, adhesives, inks, waxes, caulks, and wood stains.

Chemguard S-761PL is listed in the Code of Federal Regulations*, Food and Drugs, 21 CFR 176.170, components of paper and paperboard in contact with nonalcoholic aqueous and fatty foods, Conditions of Use B through H. The limitations and Conditions of Use are defined as:

- A maximum treatment level of 0.17 lb Chemguard S-761PLL solids per 1,000 ft² of paper or paperboard.
- Conditions of Use B through H of 21 CFR 176.170 are shown below:
B – Boiling water sterilized
C – Hot filled or pasteurized above 66°C (150°F)

- D – Hot filled or pasteurized below 66°C (150°F)
- E – Room temperature filled and stored (no thermal treatment in the container)
- F – Refrigerated storage (no thermal treatment in the container)
- G – Frozen storage (no thermal treatment in the container)
- H – Frozen or refrigerated storage (ready prepared foods intended to be reheated in the container at time of use):
 - Aqueous or oil-in-water emulsion of high or low fat
 - Aqueous, high or low free oil or fat

Equipment for Paper Protection

Chemguard S-761PL can be applied on or off the paper machine. Any equipment that can apply a uniform coating of the solution to paper or board can usually apply S-761PL successfully. Surface treatment is the preferred method as it offers wide versatility in location and equipment while providing a less expensive and more easily controlled application than internal treatments.

Recommended Level of Treatment

Treatments can be made to one side or both sides of the paper or paperboard. The greater the amount of S-761PL added to the surface of the treated paper or paperboard, the greater the oil and grease repellency. Variations in alum, filler, size, starch, and other sheet or treatment parameters may affect holdout.

For an initial trial, the recommended rate is 0.1 lb of Chemguard S-761PL as received per 1,000 ft² of area.

Control of Solution pH and Water Hardness

The treating solution pH has little effect on Chemguard S-761PL over a pH range of 5–10. Performance is slightly better for solutions of pH 9–10.

Water used to make the treating solution must be soft (less than 50 ppm hardness) or have sufficient chelating chemicals added to control hard water ions. Failure to soften the water will reduce repellency by precipitating the S-761PL. Softening agents containing water soluble salts of EDTA such as Versene® 100 (Dow Chemical Co.) are recommended. The level of EDTA will vary with water hardness, but 0.1% is usually sufficient.

Compatibility with Sizing Agents, Alum, and Mineral Fillers

Internal sizing can reduce penetration of the Chemguard S-761PL solution, resulting in a non-uniform, shallow treatment. Internal size should be avoided or minimized. Alum can cause precipitation of S-761PL at the surface of the sheet. Alum should be eliminated or minimized using a chelating agent such as EDTA. Where a lower pH is required, acetic acid or sulfuric acid can be substituted for alum. Mineral fillers in the sheet also reduce the effectiveness of Chemguard S-761PL. Fillers increase the surface area and require more S-761PL to provide the desired repellency.

Preparation of Chemguard S-761PL Solution

Chemguard S-761PL can foam if the product is mishandled. Keep the temperature as low as practical for the conditions. Avoid unnecessary aeration of the Chemguard S-761PL by using low shear mixing equipment and minimizing solution free fall. Avoid the use of excessive chelating agents. If an antifoam is required, one of the following, or an equivalent product, is suggested:

Antifoam FG-10 (Dow Corning)

Advantage 831 (Hercules, Inc.)

Using soft water (less than 50 ppm total hardness), add all other required materials to the solution. The solution should be thoroughly mixed or blended prior to the addition of Chemguard S-761PL. It is recommended that the Chemguard S-761PL be pre-diluted to 1% with water. If necessary, Chemguard S-761PL can be added at full strength and should be uniformly distributed in the solution by gentle but complete mixing. Uneven application generally results in reduced water and oil repellency.

Solubility

Chemguard S-761PL is soluble in water and most organic solvents. The chart below is an example of the solubility of S-761PL in many solvent systems. Chemguard can assist in determining solubility in any system.

Solvent	Grams of Chemguard S-761PL/ 100 grams of solvent
Distilled Water	>1
Isopropanol	>1
Acetone	0.1
Methyl Alcohol	>2
Hydrocarbon solvents	Insoluble

All values measured at 25°C

Storage and Shelf Life

Chemguard S-761PL should be stored between 10°C and 50°C. Some solids begin to separate at temperatures below -15°C (2°F) over time. If frozen or if solids separate, warm to room temperature before use. Freezing and thawing will not affect the properties or performance. Shelf life is at least five years if stored tightly sealed in the original container at temperatures below 50°C (151°F).

Availability

Chemguard S-761PL is available in 1 oz samples, 40 lb. pails, and 440 lb. drums.

Health and Safety

Chemguard does not recommend this product for use in applications involving repeated exposure to skin contact, inhalation, or ingestion.

Please refer to the material safety data sheet (MSDS) for recommended disposal, handling, and protection information.

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