

Protective Material PM-2688



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INTRODUCTION

3M™ Protective Material PM-2688 is a hydrocarbon-based product designed to provide excellent and durable dynamic water repellency (DWR) to many synthetic fabrics. It can be used on many fiber types and provides protective performance while maintaining fabric breathability. Additionally, PM-2688 has been used successfully on cotton and polyester/cotton blends.

Branding: Only if the formulation meets stringent quality performance specifications are you entitled to make use of the Scotchgard™ Brand name, and provided you are an official licensee of 3M.

Environmental: PM-2688 is not based on perfluoroalkyl chemistry including PFOS or PFOA. It is not made, and does not degrade to, any perfluoroalkyl substance including PFOS or PFOA. Additionally, PM-2688 is not based on blocked isocyanate chemistry and does not contain alkyl phenol ethoxylate (APE) surfactants or chlorofluorocarbon (CFC) associated with ozone depletion.

TYPICAL PROPERTIES

Appearance	Milky white to amber dispersion
Typical Analysis	25% Solids
	67% Water
	8% Propylene glycol
Charge	Mildly cationic
Density	1.0 kg/L (8.3 lbs/gal)
pH	5-8
Shelf Life	2 Years after production date

PM-2688 should not be stored at temperatures over 50°C (122°F).

PM-2688 is freeze/thaw stable to -20°C (-4°F). If exposed to freezing temperatures, return to a temperature above 5°C (41°F) before using. Avoid agitation during the thawing process as this can destabilize the dispersion.



FABRIC PREPARATION

Fabrics to be treated with PM-2688 should be clean and as free as possible of residual processing agents. Materials such as sizes, alkalis, printing gums, dyeing auxiliaries, antifoams, wetting agents/surfactants, can all affect the absorbency and penetration of the treating bath into the fabric. The resulting uneven or inconsistent application can cause reduced durability and inferior repellency performance. Fabric pH (5.5 to 6.5) and percent alkalinity (as NaOH, preferably 0.0 to 0.05%) are recommended. In general, good fabric preparation practices should be followed to obtain the most efficient and effective performance from the product.

APPLICATION

PM-2688 is especially suitable to be used alone as a non-fluorochemical based DWR product. Typical application rates of PM-2688 range from 30-80 grams/liter treatment solution. It is suggested that any formulation first be evaluated in the laboratory, both for compatibility and for performance. Factors such as fiber content, yarn type, thread density, fabric basis weight, chemical additives and treating conditions all influence the usage level required to achieve the desired performance.

Formulations based on PM-2688 are typically applied at the mill by padding, followed by immediate drying/curing on a tenter frame. Padding can be accomplished on typical mill padding equipment (two roll or three roll). Bath temperatures of 15-40°C (60-100°F) are generally suitable. PM-2688 is easily diluted with water. A wet pick up (WPU) of 20-40% is typical for nylon taffeta, while a WPU between 55-70% is typical on other nylon and polyester fabrics. Where mill WPU conditions differ from the typical pad formulations listed, adjust the chemical concentrations to compensate for the different wet pick-up.

Fugitive wetting agents, such as isopropyl alcohol, or non-rewetting surfactants should be used whenever necessary to achieve adequate wetting of the fabrics and proper penetration of the finish. Addition of 1 g/l non-rewetting surfactant or 10-30 g/l alcohol to the treating bath is recommended, especially for 'hard to wet' fabrics.



CAUTION! Isopropyl alcohol is considered flammable. Follow all safety procedures. Additionally, some fugitive wetting agents may also have lower flash points. Consult wetting agent (and any other auxiliary) SDS for safe handling practices. Typically, PM-2688 is added after isopropyl alcohol; otherwise, flocculation may occur.

Consistent with good finishing mill procedures, it is always advisable that the finishing bath be filtered as it is transferred to the padder (foulard) in order to ensure dried particulates or other solid contaminants are not introduced into the pad bath.

In the event foaming problems are encountered, and a defoaming or antifoaming chemical is required, a non-silicone foam control agent is advised. Evaluate any foam control agent both for bath compatibility, and its effect on performance.

Note: Thoroughly evaluate any silicone in the laboratory to determine its effect on performance prior to inclusion in any mill production, since such materials can severely affect repellent formulations. All fabrics, as well as mixing and processing equipment must be free of silicones to avoid contamination of the bath. Use of silicones even in earlier production steps could still cause contamination of the bath. Likewise, the use of antistatic agents in a pad bath should be evaluated in the laboratory for their subsequent effects on DWR performance.

TYPICAL PAD APPLICATION OF 3M PROTECTIVE CHEMICAL PM-2688

The following formulations are only offered as a guide for the application of PM-2688 based formulations on synthetic fabrics. It is suggested that any formulation first be evaluated in the laboratory for overall compatibility and for product performance.

- A. Polyester Woven Including Dobby, Pongee Constructions.
 - 0–2 ml/l Acetic acid (60%)
 - 30–80 g/l PM-2688

- B. Polyamide Woven Including Taslan, Polyamide/Spandex Blends.
 - 0–2 ml/l Acetic acid (60%)
 - 30–80 g/l PM-2688

- C. Cotton or Poly/Cotton Woven.
 - 0–2 ml/l Acetic acid (60%)
 - 50–80 g/l PM-2688
 - 0–10 g/l Crosslinker (optional)

Note: Addition of 1 g/l non-rewetting surfactant or 10–30 g/l Isopropyl alcohol is recommended especially for ‘hard to wet’ fabrics.

DRY AND CURE CONDITIONS

The drying and curing of PM-2688 is generally accomplished in one-step. Drying is not a critical step and can be done over a wide temperature and time range depending upon specific mill practices.

Curing temperatures are readily achieved under mill conditions when 100% synthetic fibers are ‘heat set’, or under mill conditions normally used for curing resin finishes. Typical curing temperatures are in the range of 130–180°C (230–356°F) respectively, during 30 seconds to 3 minutes depending on the kind of fabric and curing facilities.

Fabric weight and wet pick-up are key variables in determining tenter frame oven settings and line speeds. Excessive heat exposure to disperse-dyed fabrics may lead to dye sublimation on fabric surface, which will cause reduced colorfastness and crockfastness.





ENVIRONMENTAL HEALTH AND SAFETY

Normal care should be taken to avoid skin contact, eye contact and prolonged breathing of vapors or dusts. Hands should be washed prior to smoking or eating. Before using this product, please read the current PM-2688 Safety Data Sheet (available through your local representative), and the precautionary statement on the product package. Follow all applicable directions for personal protective equipment. When using auxiliary products with PM-2688, be sure to also review the appropriate Safety Data Sheet for each material used.

IMPORTANT NOTICE TO PURCHASER:

The information in this publication is based on the tests we believe are reliable. Your results may vary due to differences in test type and conditions. You must evaluate and determine whether the product is suitable for your intended application. Since conditions of product use are outside of our control and vary widely, the following is made in lieu of all express or implied warranties (including the warranties of merchantability or fitness for a particular purpose). Except where prohibited by law, 3M's only obligation and only remedy is replacement or, at 3M's option, refund of the original purchase price of the product that is shown to have been defective when you received it. In no case will 3M be liable for any direct, indirect, special, incidental, or consequential damages (including, without limitation, lost profits, goodwill, and business opportunity) based on breach of warranty, condition or contract, negligence, strict tort, or any other legal or equitable theory.



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