



PFAS status



History & New Technology (EHS&R)

- 1940's: Development of ECF process at 3M research laboratories.
- 1950's: Commercialization of the first 'Scotchgard™' protector product based on POSF.
- 1990's: 3M discovered that a breakdown product of the original chemistry (PFOS) was found to be widespread in the environment
- 2000: May 16th, 3M announced the decision to phase out the POSF based products.
- 2002: First product introductions of new generation high performance protectors, based on PBSF as building block.

History & New Technology (EHS&R)

- Perfluorooctane sulphonyl, PFOS ($C_8F_{17}SO_2^-$)
- Chemical found widespread in the environment
- 3M stopped PFOS manufacturing in Dec 2000
- Extensive research indicates that no health or environmental effects result from the extremely low levels found in the environment





History & New Technology (EHS&R)

Reasons :

- **Bio accumulation**
- **Non biodegradable**
- **Causing deceases**

History & New Technology (EHS&R)

Technical challenge :

Identify a new fluorochemical building block with a low potential to bioaccumulate that can be used to manufacture high performance protective materials.



PFBS
Elektrofluorination



PFHA
Telemerisation



History & New Technology (EHS&R)

Bio-concentration Factor (BCF): rainbow trout

	<u>Chemical</u>	<u>Liver</u>	<u>Blood</u>
Martin JW, Mabury SA, Solomon KR, Muir DCG. Bioconcentration and tissue distribution of perfluorinated acids in rainbow trout (oncorhynchus mykiss). Environ. Toxicol. Chem., Vol 22, No.1, pp. 196-203, 2003.	PFBS (C ₄)	< 1	< 1
	PFHS (C ₆)	54	59
	PFOS (C ₈)	2,900	3,100
	PFOA (C ₈)	12	25
	PFDA (C ₁₀)	1,100	1,900
	PFUNA (C ₁₁)	3,800	5,500
	PFDOA (C ₁₂)	11,000	18,000
	PFTA (C ₁₄)	8,700	20,000



History & New Technology (EHS&R)

USA – EPA

Perfluorooctanoic Acid (PFOA) and Fluorinated Telomers
[http:// www. epa. gov/opptintr/pfoa/pfoastewardship.htm](http://www.epa.gov/opptintr/pfoa/pfoastewardship.htm)

TO COMMIT TO ACHIEVE, NO LATER THAN 2010, A 95 % REDUCTION, MEASURED FROM THE 2000 BASELINE, IN BOTH: FACILITY EMISSIONS TO ALL MEDIA OF PFOA, PRECURSOR CHEMICALS THAT CAN BREAK DOWN TO PFOA, AND RELATED HIGHER HOMOLOGUE CHEMICALS, AND PRODUCT CONTENT LEVELS OF PFOA, PRECURSOR CHEMICALS THAT CAN BREAK DOWN TO PFOA, AND RELATED HIGHER HOMOLOGUE CHEMICALS.

TO COMMIT TO WORKING TOWARD THE ELIMINATION OF PFOA, PFOA PRECURSORS, AND RELATED HIGHER HOMOLOGUE CHEMICALS FROM EMISSIONS AND PRODUCTS BY FIVE YEARS THEREAFTER, OR NO LATER THAN 2015.



November 6th. 2019

Dear xxxxxxx,

Please be aware that 3M is in the process of transitioning certain Scotchgard™ products to formulations which do not use perfluoroalkyl or polyfluoroalkyl substances (“PFAS”). This decision to transition away from the use of PFAS in certain applications reflects our commitment to environmental stewardship and minimizing the impact of our products on the environment. We anticipate that this decision will help us remain aligned with market demands and evolving stakeholder expectations.

The Scotchgard formulations that are impacted by this decision are outlined below. For these impacted products, we will stop manufacturing by June 30, 2020. We intend to discontinue sales of impacted products by December 31, 2020.



Impacted Products











PM-3650, PM-4700, PM-4701, PM-490, PM-4800, PM-1359, PM-1680, PM-20288, PM 3635, PM-3675, PM-4801, PM-2055, PM-6284, PM-353, PM-1690, PM-492, PM-93, PM-900, PM-3633, and PM-1399

Non-Impacted Products

PFAS: PM-3810, PM-870, PM-5805, PM-5000, FX-1000 and PM-5801

PFAS-Free: PM-3705, PM-226, PM-3701, PM-3888, PM-2688, PM-672, PM-1700, PM-3700, PM-1880 and PM-661

Leather (PFAS free)
















PM-3870	PM-3869
 <p>Water Based</p>	 <p>Solvent Based</p>
 <p>Good Penetration Into Leather</p>	 <p>Good Penetration Into Leather</p>
 <p>Water Repellency</p>	 <p>Water Repellency</p>
 <p>Abrasion Resistant Performance</p>	 <p>Abrasion Resistant Performance</p>
 <p>Typically Drum or Spray Applied</p>	 <p>Typically Spray Applied</p>



Leather (PFC free)

Product	PM-3870	PM-3869	
Solids	25%	25%	
Type	Water based emulsion	Solvent based in n-heptane /ethylacetat	
Ionicity	Anionic	-	
Application	Drum or spray treatment	Spray treatment	

Textile (PFAS free)

PM-3705	PM-3888	PM-2688
 <p>Water Based</p>	 <p>Water Based</p>	 <p>Water Based</p>
 <p>Highly water resistance Fabric remain soft and breathable</p>	 <p>Highly water resistance Fabric remain soft and breathable</p>	 <p>Highly water resistance Fabric remain soft and breathable</p>
 <p>Fluorine free water repellent</p>	 <p>Fluorine free water repellent</p>	 <p>Fluorine free water repellent</p>
 <p>Durable Protection</p>	 <p>Durable Protection</p>	 <p>Durable Protection</p>
 <p>Typically pad applied</p>	 <p>Typically pad applied</p>	 <p>Typically pad applied</p>

Textile (PFAS free)

PM-226	PM-2740
 <p>Water Based</p>	 <p>Water Based</p>
 <p>Improved Hydrophilicity On PES</p>	 <p>Stain resistant treatment</p>
 <p>Fluorine free moisture management</p>	 <p>Fluorine free</p>
 <p>Durable Protection</p>	 <p>Durable Protection</p>
 <p>Typically exhaust applied</p>	 <p>Typically pad applied</p>

Textile (PFAS free)



Product	PM-3705	PM-3888	PM-2688
Solids	25%	25%	25%
Type	Waterbased emulsion	Waterbased emulsion	Waterbased emulsion
Ionicity	Cationic	Cationic	Cationic
Properties	Excellent spray test and durability on synthetic fibers	Excellent spray test and durability on synthetic fibers	Excellent spray test and durability on synthetic fibers . Improved Bundesmann results

Textile (PFAS free)



Product	PM-226	PM-2740	
Solids	20%	25%	
Type	Waterbased emulsion	Waterbased emulsion	
Ionicity	Non-ionic	Cationic	
Properties	durable water absorbency (wicking) and stain release effect on PES	Stain release treatment for Co and Co blends . Not repellent	