



	PFAS WORKING GROUP AERIAL DELIVERY ENGINEERING SUPPORT TEAM (ADEST)	
	2023 PIA 2nd Regular Meeting, Government Systems	24 AUGUST 2023

Controlled by:	DEVCOM SC
Controlled by:	FCDD-SCD-SAE
CUI Category:	N/A
Distribution Control:	Distribution A
POC:	Justin Silvia, Textile Technologist

PFAS DESCRIPTION



Per/Poly Fluoroalkyl Substances

- General term for thousands of chemicals used in high-performance applications.
 - Impart water, oil repellency, stain/soil release and non-stick properties
- Highly fluorinated chemicals with two or more fluorine atoms bonded to one carbon.

Uses & Properties

- Plastics/Rubber, Electronics, Coatings/Paints, Building/Construction, Lubricants
- Food packaging, carpet, leather goods, fire fighting foams, protective clothing.





PFAS REGULATIONS TIMELINE

Targeted

- Environmentally persistent in soil, water, air and food
- Uses and industries related to consumer goods

PFAS prohibited in products by 2030

- US – Chemical Data Reporting, Significant New Use Rule and Voluntary PFAS Reduction
 - National Defense Authorization Act (NDAA) adds PFAS to the Toxic Release Inventory (TRI) annually
 - ME/MD/CA – food packaging, carpet, FF foam, cookware & children’s products: 2023 – 2025
 - CA/MN/CO/NY/RI/VT – textile article, outerwear, cosmetics, cookware: 2024 - 2030
 - Exceptions for critical use items difficult to obtain.
- Globally (EU & Asia) – Adopting new restrictions in 2025
 - Banning import/export & targeting C6 finishes

Litigation

- Forcing industries to exit PFAS production & use
 - Twenty-four states are pursuing litigation against the manufacturers of PFAS chemicals
 - Chemical manufacturers, OEM & Tier 1 users

DEVCOM SC PFAS WORKING GROUP



Cross-functional Team

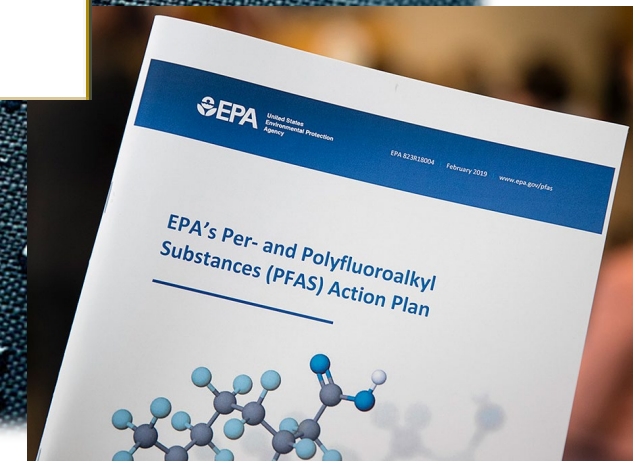
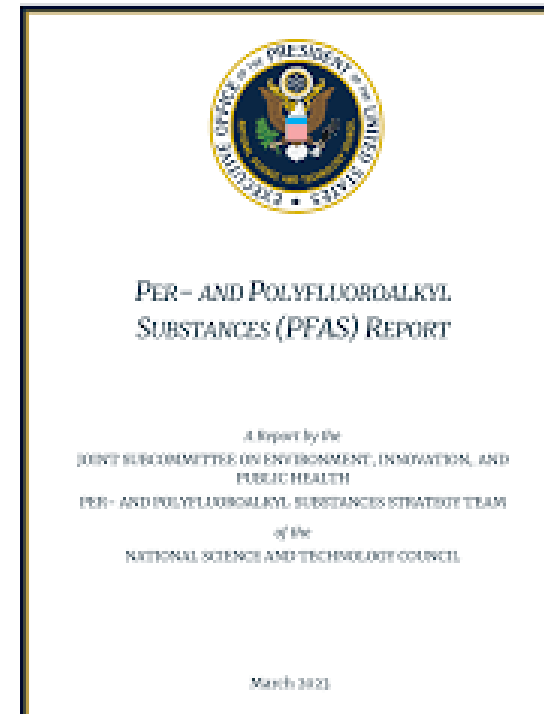
- SMEs from all services and applications
- Several active programs for fluorine-free solutions

Current Fluorine-free alternatives

- Provide water repellency
- Little to no oil/stain repellency

Collaboration

- Industry and Academia
- Coating, fabric, yarn and fiber development





PFAS IN AERIAL DELIVERY

Textile Coatings

- Canopy, container suspension lines and components.
 - Test methods include Spray, Hydrostatic Resistance & Dynamic Water Absorption
 - Friction resistance, processing aid and durability.
- Some material types require oil/stain repellency.
 - Test methods include Oil Rating & Soil Release

Impact of Fluorine-Free

- Performance
- Supply chain and disposal

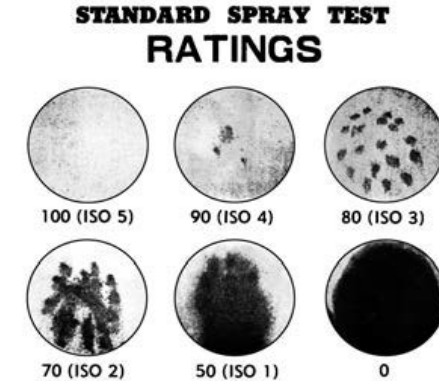
Liquid/Surface	Surface Tension
Water	70-72
Oils (Hydrocarbon)	20-40
Silicone	20-25
Fluorine	10-20
Nylon 6,6	40-43

PFAS PERFORMANCE AERIAL DELIVERY

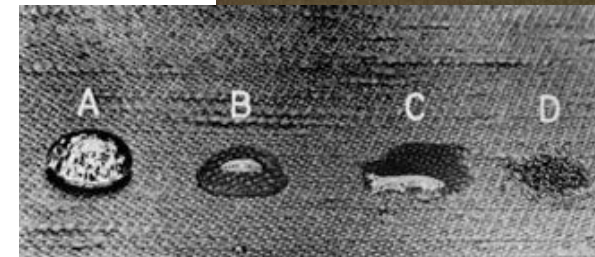
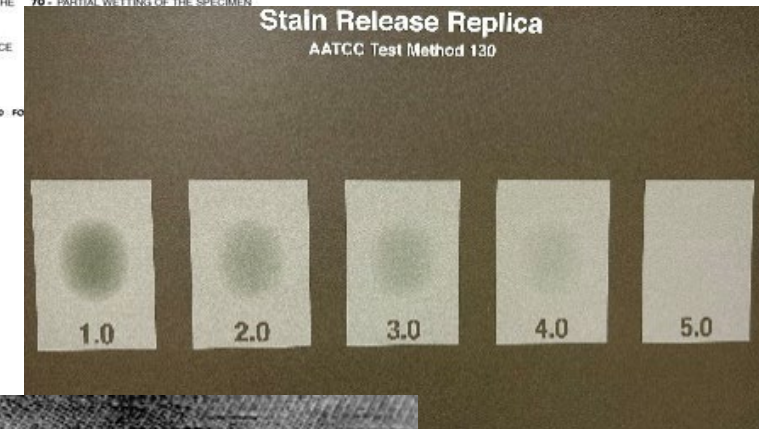


Test Methods

- Spray rating (AATCC 22)
 - Initial & 1/5 Launderings (Ratings: 100, 90/90)
- Soil release rating (AATCC 130)
 - Laundered Corn Oil stain, Rating: 4-5 (5 = no residual stain)
- Dynamic Absorption % (AATCC 70)
 - Initial & 20 Launderings (Rating: 2.5-5 & 2.5)
- Oil rating (AATCC 118)
 - Initial & 1/5 Launderings (Rating: A, dodecane/heptane)
- Hydrostatic Resistance (AATCC 127)



100 - NO STICKING OR WETTING OF THE SPECIMEN FACE
90 - SLIGHT RANDOM STICKING OR WETTING OF THE SPECIMEN FACE
80 - WETTING OF SPECIMEN FACE AT SPRAY POINTS
70 - PARTIAL WETTING OF THE SPECIMEN
50 - ...
0 - ...
COLORED WATER USED FOR



PATH FORWARD

- Collaboration with Soldier Center Teams
 - All services & applications represented
- Pursue Industry Alternatives
 - Individual finish evaluations
 - Commercially available submissions
- Monitor State/Federal Restrictions
 - NDAA/EPA guidance
 - Water testing, clean-up/disposal, food packaging, FF foam and consumer products
- Commercial Trends
 - Maintain durable, high-performance fabrics
 - Industry Associations (USIFI, ATA, NCTO, etc.)
 - Standards Organizations (AATCC, ASTM, ISO, etc.)





THANK YOU.

ADEST PFAS POC
Justin Silvia – Textile Technologist
justin.j.silvia.civ@army.mil
508-206-3219



DEVCOM