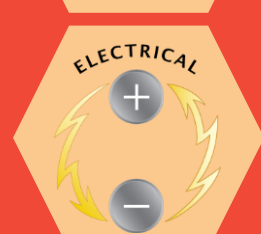


Product & Market Guide

for Teflon™ industrial coatings

PTFE • ETFE • PFA • FEP
fluoropolymer coatings



Teflon™ Industrial Coatings

Since the discovery of PTFE in 1938, Teflon™ industrial coatings have gained acceptance in a wide variety of applications. By expanding the basic technology, Teflon™ industrial coating products have demonstrated a versatility and functionality unmatched by any other engineering material. Available in a full range of powder and liquid forms, Teflon™ industrial coatings allow for almost unlimited application to a wide variety of parts and configurations, always adding value beyond their inherent nonstick qualities.

With several families of fluoropolymer coatings offered by The Chemours Company, there are a number of Teflon™ industrial coatings to provide you with the best coating for your particular application.

Chemours and Living Chemistry

The Chemours Company believes in bringing better chemistry to life, to shape markets, and make modern living better. Chemistry is a living thing, always evolving, ever changing, constantly transforming.

But what happens when we shape that change? When we guide that evolution, chemistry changes life. That's living chemistry, and it allows us to enable, create, and empower change. It changes lives, shapes markets, makes manufacturing more efficient, and redefines industries. It creates bigger market impacts with smaller carbon footprints.

The Chemours Company utilizes living chemistry along with end-to-end support, world-class products, and tailor-made solutions. Living chemistry empowers The Chemours Company to be a catalyst for change to help customers do better, be better, and build better.

Properties of Teflon™ Industrial Coatings

The following characteristics are common to all Teflon™ industrial coatings in varying degrees. The unique combination of properties inherent to all Teflon™ industrial coatings make them a natural choice within a number of industries.



Nonstick: Very few solid substances will permanently adhere to a Teflon™ industrial coating. While tacky materials may show some adhesion, almost all substances release easily.



Low Coefficient of Friction: Friction is a force created when two objects rub together that hinders the motion. With Teflon™ industrial coatings, the coefficient of friction is generally lowered to a range of 0.05 to 0.20, depending on the load, sliding speed, and type of coating used.



Heat Resistance: Teflon™ industrial coatings can operate continuously at temperatures up to 500°F, and can be used for intermittent service up to 550°F with adequate ventilation without affecting any other properties.

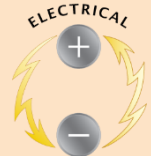
Cryogenic Stability: Many Teflon™ industrial coatings can withstand temperatures as low as -454°F without loss of physical properties or affecting any other properties.



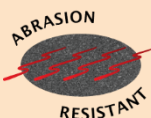
Chemical Resistance: Chemical environments usually do not affect Teflon™ industrial coatings. The only chemicals known to affect these coatings are molten alkali metals and highly reactive fluorinating agents. The coatings' low porosity leads to great permeation resistance.



Non-Wetting: Teflon™ industrial coatings are both hydrophobic and oleophobic. The low surface energy of the coatings means that the cohesive forces in the water are strong enough to make the water bead up and not spread across the surface of the coating.



Unique Electrical Properties: Over a wide range of frequencies, Teflon™ industrial coatings have a high dielectric strength, low dissipation factor, and high surface resistivity. Adding fillers to certain coatings can make them electro-conductive enough to be used as an anti-static coating.



Abrasion Resistance: Teflon™ industrial coatings are very resistant to scratches and abrasion due to their excellent durability and toughness. Surface scarring is minimal, especially in certain coatings with property enhancing fillers.



FDA-Conforming: Many Teflon™ industrial coatings meet requirements set by the Food and Drug Administration. These specific coatings can be used for indirect food contact according to the regulations of 21CFR.

Properties of Teflon™ Industrial Coatings

Property	PTFE	FEP	PFA	ETFE	Teflon-S	Units	ASTM
Nonstick	Excellent	Excellent	Excellent	Good	Good	-	None
Chemical Resistance	Good	Excellent	Excellent	Very Good	Good	-	None
Abrasion Resistance	Good	Good	Very Good	Excellent	Excellent	-	None
Salt Spray Resistance	Fair	Excellent	Excellent	Excellent	Excellent	-	None
Maximum Use Temperature						°F	None
Continuous	500	400	500	300	300 - 425		
Intermittent	550	450	550	350	300 - 425		
Coefficient of Friction						-	D1894
Static	.12 - .15	.12 - .20	.20	.24 - .50	.10 - .40		
Dynamic	.05 - .10	.08 - .30	-	.30 - .40	-		
Hardness	60	55	60	75	60 - 90	Shore D	D2240
Specific Gravity	2.2	2.15	2.15	1.7	-	-	D792
Melting Point	627	500	575	520	-	°F	DTA, E-168
Thermal Conductivity	1.7	1.35	1.3	1.65	-	See Note 1	DuPont
Dielectric Strength	16	53	78	78	Up to 58	Volts/micron	D149
Surface Resistivity	1.0E+18	1.0E+18	1.0E+18	1.0E+17	-	(ohm)(Sq.)	D257
Volume Resistivity	1.0E+18	1.0E+16	1.0E+16	1.0E+16	-	(ohm)(cm.)	D257
Tensile Strength	20	23	25	45	20 - 80	Mpa@23 C	D638
Elongation at Break	200 - 400	325	300	300	1 - 150	% @ 23 C	D638
Water Absorption	<0.01	<0.01	<0.03	<0.007	-	%	D570
Permeability						See Note 2	D1434
CO ₂	Porous	1700	2260	250	-		
NO ₂	Porous	320	290	30	-		
O ₂	Porous	750	880	100	-		

Note 1: Thermal Conductivity Units = (BTU)(in) / (ft²)(hr)(°F)

Note 2: Permeability Units = (cc)(mil thickness) / (100 in²)(24 hr)(atm) @ 77°F

PTFE Fluoropolymer Coating Systems

PTFE (polytetrafluoroethylene) coatings have the highest operating temperature of any fluoropolymer (260°C/500°F), as well as the lowest coefficient of friction, good abrasion resistance, and good chemical resistance. These multi-coat systems are available in water-based liquid form only. Below is a table of PTFE topcoats. Recommended primers can be found on page 7.

Code	Description	Color	Carrier	FDA	Max Use Temp (°F)	Cure Temp (°F)	Film Build per Coat	Max Total Film Build
851G-214	Standard film build	Green	Water	No	500	725	0.5 - 1.5	3.0
851G-221	High film build	Gray	Water	No	500	750	0.8 - 3.0	8.0
851G-224	High film build	Green	Water	No	500	750	0.8 - 3.0	8.0
851G-255	High film build	Black	Water	No	500	750	0.8 - 3.0	8.0
852G-201	Standard film build	Clear	Water	Yes	500	725	0.8 - 1.0	1.0
852G-202	High film build	Clear	Water	No	500	750	0.8 - 1.0	3.0

FEP Fluoropolymer Coating Systems

FEP (fluorinated ethylene propylene copolymer) coatings melt and flow during baking to provide nonporous films and have a maximum operating temperature of 400°F. Teflon™ FEP industrial coatings have excellent nonstick coating properties and a low coefficient of friction. These coatings provide excellent chemical resistance and have a high dielectric strength. These multi-coat systems are available in water-based liquid and powder forms. Below is a table of FEP topcoats. Recommended primers can be found on page 7.

Code	Description	Color	Carrier	FDA	Max Use Temp (°F)	Cure Temp (°F)	Film Build per Coat	Max Total Film Build
532G-8110	Standard grade	Clear	Powder	Yes	400	650 - 700	1.0 - 2.0	4.0 - 6.0
532G-8410	High molecular weight	Clear	Powder	Yes	400	650 - 700	1.0 - 2.0	10.0
856G-200	Standard grade	Clear	Water	Yes	400	650 - 700	0.6	5.0
856G-204	Standard grade	Green	Water	No	400	650 - 700	0.6	5.0
856G-410	High build	Clear	Water	Yes	400	650 - 700	1.0 - 2.0	7.0

PFA Fluoropolymer Coating Systems

PFA (perfluoroalkoxy) coatings melt and flow during baking to provide nonporous films. Teflon™ PFA industrial coatings provide higher continuous use temperature (260°C/500°F) and are tougher than PTFE or FEP. They also provide excellent chemical resistance and have a high dielectric strength. These multi-coat systems are available in water-based liquid and powder forms. Below is a table of PFA topcoats. Recommended primers can be found on page 7.

Code	Description	Color	Carrier	FDA	Max Use Temp (°F)	Cure Temp (°F)	Film Build per Coat	Max Total Film Build
532G-13032	Abrasion resistant	Light Gray	Powder	Yes	500	675 - 735	0.8 - 2.0	10.0
532G-13054	Permeation resistant	Ruby Red	Powder	No	500	675 - 735	4.0 - 7.0	20.0
532G-5010	Standard grade	Clear	Powder	Yes	500	675 - 735	1.0 - 4.0	10.0
532G-5011	Standard grade - fine	Clear	Powder	Yes	500	675 - 735	1.0 - 2.0	2.0
532G-5310	Stress crack resistant	Clear	Powder	Yes	500	675 - 735	1.0 - 4.0	10.0
532G-7000	Standard grade	Spk. Clear	Powder	Yes	500	675 - 735	1.0 - 4.0	10.0
532G-7410	Stress crack resistant	Clear	Powder	Yes	500	675 - 735	1.0 - 2.0	10.0
532G-7411	Stress crack resistant	Clear	Powder	Yes	500	675 - 735	1.0 - 2.0	10.0
858G-210	Liquid PFA topcoat	Clear	Water	Yes	500	675 - 735	0.8 - 1.2	3.0
858G-917	Permeation resistant	Ruby Red	Water	No	500	675 - 735	3.0 - 6.0	40.0
MJ-501	High film build	Tan	Powder	No	500	675 - 735	1.0 - 6.0	25.0

ETFE Fluoropolymer Coating Systems

ETFE (ethylene and tetrafluoroethylene copolymer) coatings are sold under the Tefzel® trademark. Although not fully fluorinated, Tefzel® ETFE has excellent chemical resistance because it is a nonporous film, and can operate continuously at 149°C (300°F). This resin is the toughest of the fluoropolymer coatings and provides a highly durable protective coating. These multi-coat systems are available in water-based liquid and powder forms. Below is a table of ETFE topcoats. Recommended primers can be found on page 7.

Code	Description	Color	Carrier	FDA	Max Use Temp (°F)	Cure Temp (°F)	Film Build per Coat	Max Total Film Build
532-6118	Permeation resistant	Spk. Beige	Powder	Yes	300	600	3.0 - 10.0	25.0
532-6200	UltrasMOOTH	White	Powder	Yes	300	550	2.0 - 3.0	6.0
532-6210	UltrasMOOTH	Clear	Powder	Yes	300	550	2.0 - 3.0	6.0
532-6310	High build	Clear	Powder	Yes	300	575	4.0 - 6.0	25.0
532-6314	High build	Green	Powder	Yes	300	575	4.0 - 6.0	25.0
532-6410	Super high build	Clear	Powder	No	300	580	8.0 - 10.0	60.0 - 80.0
699-205	Permeation resistant	Pewter	Water	No	300	600	2.0 - 12.0	40.0

One Coat Systems

One Coats are solvent- and water-based and are formulated with special blends of fluoropolymers and other high-performance resins to improve toughness and abrasion resistance. While baking, the stratification process allows most of the fluoropolymer properties (low friction and nonstick) to be retained. These resins can sometimes be applied to smooth, clean metal. These one-coat systems are available in solvent- and water-based liquid and powder forms.

Code	Description	Color	Carrier	FDA	Max Use Temp (°F)	Cure Temp (°F)	Film Build per Coat	Max Total Film Build
420G-104 (PTFE)	One coat	Gray	Solvent	Yes	500	700 - 750	0.8	0.8
420G-109 (PTFE)	One coat	Spk. Black	Solvent	Yes	500	700 - 750	0.8	0.8
420G-129 (PTFE)	One coat	Black	Solvent	Yes	500	700 - 750	0.8	0.8
532-1003 (FEP)	One coat	Black	Powder	No	300	400	0.8 - 1.5	3.0
856G-114 (FEP)	Conductive	Green	Water	No	400	660	2.0	3.0
857G-018 (PTFE)	One coat	Blue	Water	No	400	450	0.8 - 1.2	2.5
857G-508 (PTFE)	One coat	Red	Water	No	400	450	0.8 - 1.2	2.5
857G-519 (PTFE)	One coat	Black	Water	No	400	450	0.8 - 1.2	2.5
857G-575 (PTFE)	One coat	Yellow	Water	No	400	450	0.8 - 1.2	2.5
954G-303 (FEP)	Low cure	Black	Solvent	No	300	320 - 500	1.2	2.5
954G-304 (FEP)	Low cure	Green	Solvent	No	300	320 - 500	1.2	2.5
958G-203 (FEP)	One coat/primer	Black	Solvent	Yes	425	650	0.6 - 1.2	2.5
958G-303 (PTFE)	Dry lube	Black	Solvent	No	500	350 - 650	0.6 - 0.8	0.6 - 0.8
958G-313 (PTFE)	Abrasion resistant dry lube	Black	Solvent	No	500	350 - 650	0.6 - 0.8	4.0
958G-406 (PTFE)	Abrasion resistant	Black	Solvent	No	390	356	1.6 - 2.0	4.0
958G-414 (PTFE)	Abrasion resistant	Green	Solvent	No	390	356	2.0	4.0
959G-203 (FEP)	One coat	Black	Solvent	Yes	425	650	0.6 - 1.2	2.5
959G-204 (FEP)	One coat	Green	Solvent	No	425	650	0.6 - 1.2	2.5
959G-205 (FEP)	One coat	Brown	Solvent	Yes	425	650	0.6 - 1.2	2.5

Specialty Systems

Specialty Systems are aqueous-based, specially blended multi-coat systems of PTFE, FEP, and PFA that optimize performance characteristics through material synergy. Formulations are available with internal reinforcement materials in the coating matrix to increase abrasion resistance and extend service life.

Code	Description	Color	Carrier	FDA	Max Use Temp (F)	Cure Temp (°F)	Film Build per Coat	Max Total Film Build
857G-030	Filled primer, on-smooth	Black	Water	Yes	500	815	0.3 - 0.4	0.4
857G-230	Topcoat	Black	Water	Yes	500	815	0.6 - 0.8	0.8
857G-040	Filled primer, on-smooth	Black	Water	Yes	500	815	0.3 - 0.4	0.4
857G-140	Filled midcoat	Black	Water	Yes	500	815	0.6 - 0.8	0.8
857G-240	Topcoat	Clear	Water	Yes	500	815	0.3 - 0.4	0.4
857G-130	Midcoat	Pewter	Water	Yes	500	815	0.6 - 0.8	0.8
857G-135	Midcoat	Black	Water	Yes	500	815	0.6 - 0.8	0.8
953G-401	Topcoat	Pewter	Water	Yes	400	690	0.7 - 0.8	0.8
953G-506	Primer	Dk. Violet	Water	Yes	400	690	0.3 - 0.4	0.4

Primers

Teflon™ primers are an effective way to prepare a surface before the coating is applied. They ensure proper adhesion, increase durability, and give additional protection to the substrate. With use of the primer, the coating is given a smooth surface to which it can bind, which creates a more protective layer and decreases porosity of the coating to the substrate. Below is a table of primers and the coating systems they can be used with.

Primer	Color	FDA	Carrier	PTFE	PFA	FEP	ETFE
420G-703	Black	Yes	Solvent		✓	✓	
532G-42331	Black	Yes	Powder		✓	✓	
532-6405	Green	No	Powder				✓
699N-129	Black	Yes	Water				✓
857G-030	Black	Yes	Water	✓	✓	✓	
855G-021	Blue	Yes	Water	✓	✓	✓	
857G-040	Black	Yes	Water	✓	✓	✓	
850G-314	Green	No	Water/Acid	✓	✓	✓	
850G-321	Gray	No	Water/Acid	✓	✓	✓	
850G-204	Green	No	Water/Acid	✓	✓	✓	
857G-100	Black	Yes	Water	✓	✓	✓	
953G-506	Dk. Violet	Yes	Water				
959G-203	Black	Yes	Solvent		✓	✓	
959G-204	Green	No	Solvent		✓	✓	
959G-205	Brown	Yes	Solvent		✓	✓	

Thinners

Teflon™ thinners can be used for jobs where a lower viscosity is needed or for cleaning and maintaining your spray equipment.

Code	Clean-Up and Viscosity Reduction
TN-8595	420G line, 958G line, 959G line
TN-8718	954G line
TN-8748	954G line
Deionized water	All water-based products

This chart can be used as a reference for choosing the best Teflon™ industrial coating for your needs. The markets are paired with the most appropriate coating based on their properties along with examples of applications that meet those specifications.

Markets that Use Teflon™ Coatings				
Market	Typical Applications	Coating Requirements	Product Examples	
Aerospace	<ul style="list-style-type: none"> Fuel filters Toilet bowls Engine components 	<ul style="list-style-type: none"> Low friction Corrosion resistance Thermal stability 	850G-204 851G-314 851G-321 954G-303 954G-304	Green Gray Green Black Green
Automotive	<ul style="list-style-type: none"> Seat belt clips Fasteners Throttle body shafts 	<ul style="list-style-type: none"> Dry lubrication Corrosion resistance 	958G-303 954G-303 857G-519	Black Black Black
Chemical Processing	<ul style="list-style-type: none"> Pumps Tanks Valves Impellers Vessels 	<ul style="list-style-type: none"> Chemical resistance 	532-6410 532G-13054 858G-917 MJ-501	Green Ruby Red Ruby Red Tan
Industrial Bakeware	<ul style="list-style-type: none"> Bread pans Bun pans Flat pans Waffle grids 	<ul style="list-style-type: none"> Nonstick Low friction 	532G-5310 532G-5010 532G-13032 532G-7000 532G-7411	Clear Clear Gray Sparkling Clear Clear
Fasteners	<ul style="list-style-type: none"> Large industrial nuts and bolts 	<ul style="list-style-type: none"> Corrosion resistance 	857G-018 857G-508 857G-519 857G-575	Blue Red Black Yellow
Food Processing	<ul style="list-style-type: none"> Dough rollers Cheese molds Miscellaneous equipment 	<ul style="list-style-type: none"> Nonstick 	420G-104 420G-109 420G-129 532G-13032 532G-5010 532G-7000 959G-203 Specialty 3 Coat Reinforced System	Gray Sparkling Black Black Gray Clear Sparkling Clear Black
Hardware	<ul style="list-style-type: none"> Saw blades 	<ul style="list-style-type: none"> Nonstick Low friction 	958G-303 954G-303	Black Black
Commercial Laundry	<ul style="list-style-type: none"> Dryer baskets 	<ul style="list-style-type: none"> Nonstick Durability 	532G-13032 532G-7000 Specialty 3 Coat Reinforced System	Gray Sparkling Clear

Markets that Use Teflon™ Coatings

Market	Typical Applications	Coating Requirements	Recommended Products:	
Lawn and Garden	<ul style="list-style-type: none"> Shears Scissors 	<ul style="list-style-type: none"> Nonstick Corrosion resistance Dry lubrication 	954G-303	Black
Lighting	<ul style="list-style-type: none"> Incandescent light bulbs 	<ul style="list-style-type: none"> Heat resistance Optical clarity 	532G-5310 532G-7411	Clear Clear
Medical	<ul style="list-style-type: none"> Pill molds Centrifuge baskets Dental molds 	<ul style="list-style-type: none"> Chemical resistance Release FDA conformance 	959G-203 532-6200	Black White
Military	<ul style="list-style-type: none"> Gun clips Fire arms Launch systems 	<ul style="list-style-type: none"> Nonstick Matte finish 	954G-303 958G-303	Black Black
Mold Release	<ul style="list-style-type: none"> Golf balls Rubber mats Wide variety of applications 	<ul style="list-style-type: none"> Nonstick 	851G-214 851G-221 856G-200 856G-204	Green Gray Clear Green
Office Automation	<ul style="list-style-type: none"> Copier, printer, and fuser rolls 	<ul style="list-style-type: none"> Nonstick 	Specialty 3 Coat Reinforced System	
Oil and Gas	<ul style="list-style-type: none"> Fasteners Well heads Pump parts 	<ul style="list-style-type: none"> Corrosion resistance Chemical resistance Low friction 	857G-018 857G-508 857G-519 857G-575	Blue Red Black Yellow
Packaging	<ul style="list-style-type: none"> Heat seal bars 	<ul style="list-style-type: none"> Nonstick 	Specialty 3 Coat Reinforced System Specialty 2 Coat System	
Paper and Textile	<ul style="list-style-type: none"> Process rolls Dryer cans 	<ul style="list-style-type: none"> Corrosion resistance Nonstick 	532G-5010	Clear Specialty 3 Coat Reinforced System
Pharmaceutical	<ul style="list-style-type: none"> Vessels 	<ul style="list-style-type: none"> Nonstick Abrasion resistance 	532-6200	White
Power and Energy Production	<ul style="list-style-type: none"> Heat exchangers Coils 	<ul style="list-style-type: none"> Low friction Corrosion resistance Thermal stability 	851G-255 532-6410 532-6314 699-205	Black Clear Green Pewter
Semiconductor	<ul style="list-style-type: none"> Ducts Wafer carriers Chemical vessels Racks 	<ul style="list-style-type: none"> Release Chemical resistance Low friction 	532G-5010 532-6410 532-6310 532-6314	Clear Clear Clear Green



Chemours™

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