DuPont™ Teflon®

Industrial Coatings

DuPont™ *Teflon*® PFA Powder Coatings 532-5010, 532-5011, MP-501, and 532-5310

Description

PFA powders offer high-temperature resistance, excellent release, and the ability to uniformly coat various complex shapes with thick or thin films. Refer to **Table 1** for physical property data.

DuPont™ *Teflon*® 532-5010 and 532-5310 topcoats offer film thicknesses of 25–260 µm (1.0–10 mil); 532-5310 is a tougher and more stress-crack resistant version of PFA powder. It does not flow out quite as smoothly as 532-5010 in thin films.

Teflon® 532-5011 is a finer particle size version of 532-5010. It is used where a very smooth, thin film is required.

Teflon® MP-501 can be used as an intermediate coating, between primer and the top coat, to attain thicker films in excess of 640 µm (25 mil).

PFA powders must be used with a *Teflon*® industrial coatings primer. Examples:

FDA Conforming Primer	Not FDA Conforming Primer
420-703	850-Line
858-100	958-2XX-Line
959-203/959-205	855-Line
959-405	

FDA Status

Teflon® 532-5010, -5011, and -5310 comply with FDA Regulations in 21 CFR governing components of coatings for direct food contact when applied according to the "Applying *Teflon*® Coatings" Fact Sheet instructions. Primers must also comply for the system to conform to this FDA regulation. **Note:** *Teflon*® MP-501 does **not** comply with FDA Regulations in 21 CFR governing components of coatings for direct food contact.

Application

Refer to the "Applying *Teflon*® Coatings" Fact Sheet available from DuPont.

Pre-testing

Powder coating systems should be tested on the particular substrate and conditions to be used prior to the actual job. Conditions, substrate variation, experience in handling, and other factors can affect the ability to achieve satisfactory coatings with PFA powder coating systems. Pre-testing can eliminate costly errors in product or system selection as well as aid in ability and confidence.

Table 1
Physical Properties—DuPont™ *Teflon*® PFA Powder Coatings

Code	532-5010	532-5011	MP-501	532-5310
Type	Standard Particle Size	Fine Particle Size	High Build	Stress-Crack Resistant
Color	Clear	Clear	Tan	Clear
Coverage (all), m^2/kg at 25 µm (ft^2/lb at 1.0 mil)	18.4 (90)	18.4 (90)	19.4 (94)	18.4 (90)
Maximum Use Temperatures, °C (°F)				
Continuous	260 (500)	260 (500)	260 (500)	260 (500)
Intermittent	290 (550)	290 (550)	290 (550)	290 (550)

Surface Preparation

Primers

Apply over clean, blasted surface. For optimum adhesion, apply primers in a light coating 5–8 µm (0.2–0.3 mil). Powder topcoats may be applied to wet or force-dried primers. If bubbling occurs, force dry the primer at 200°C (400°F).

Any residual oil on the surface can adversely affect adhesion.

PFA Powders

Screen powder through 60-mesh screen before use.

Use conventional industrial electrostatic powder spray equipment or fluidized bed.

Keep electrostatic spray equipment voltage at the lowest level possible to maintain particle charge in order to prevent film builds from exceeding the critical film thickness. Excessive powder builds could lead to bubbling, blistering, and uneven films after baking.

Film Thickness

Teflon® 532-5010*****—25–100 µm (1–4 mil) per coat, up to 250 µm (10 mil) total.

Teflon® 532-5011—25–45 µm (1–1.8 mil) per coat. Usually used as a one-coat application for smooth films.

Teflon® MP-501—Up to 150 µm (6 mil) per coat, to 640+ µm (25+ mil) total.

Teflon® 532-5310*****—25–100 µm (1–4 mil) per coat, up to 25 µm (10 mil) total.

Baking

Note: All temperatures refer to metal temperature.

Teflon® 532-5010, 532-5011, and 532-5310—Bake each coat 15 min at 370–400°C (700–750°F).

Teflon® MP-501 (Intermediate)—Bake the first coat 5 min at 400°C (750°F). Bake subsequent coats 5 min at 385°C (725°F).

"Hot flocking" is difficult on thin pieces because of the tendency to cool rapidly. However, 640 µm (25 mil) coatings are possible by applying 50–75 µm (2–3 mil) per coat, with multiple bakes. Thick metal parts can achieve up to 150 µm (6 mil) per coat.

Topcoat for *Teflon*® MP-501—To reduce porosity of MP-501, a topcoat of 532-5010 should be applied up to 75 µm (3 mil) per coat. Each coat is then baked 10 min at 370°C (700°F).

Repair

To repair surface imperfections due to contamination or blistering, cut out the imperfection and touch up with a spray of 532-5010 powder. Bake 20 min at 345–370°C (650–700°F).

Storage and Stability

Teflon® PFA powders may be stored at normal room temperature, 18–27°C (65–80°F). These products should be stored in sealed plastic bags to avoid picking up excessive moisture or contamination. *Teflon*® PFA powders should be usable for an indefinite period without caking or deteriorating.

Product	Flammability Rating
532-5010 532-5011 MP-501 532-5310	Not Regulated. These products do not support combustion.

* When applying multiple coats, the part will become insulated, no longer permitting efficient electrostatic application. If higher film builds are desired, additional coats should be applied while the part is hot, right out of the oven. When this "hot flocking" technique is used, make sure it is done in a hooded area with adequate ventilation. MP-501 can be built to 640 µm (25 mil) before the insulation phenomenon becomes a problem for application.

Safety

Follow normal industrial safety practices for handling and applying powder coatings. For normal operations, a filter mask capable of excluding 0.3 µm particulates should be used. Industrial experience has clearly shown *Teflon*® coatings can be processed and used at elevated temperatures without hazard providing adequate ventilation is used. Ventilation should be available at baking temperatures, 275°C (525°F) and above. Refer to the "Safe Handling Practices" Fact Sheet, product label, and MSDS for more information.

When grit-blasting *Teflon*® finishes off aluminum or magnesium surfaces, the possibility of explosion exists if the fines are allowed to heat up. Good housekeeping practices, keeping the residue wet, and keeping the ventilation and dust collection systems in good working order reduces this risk. Refer to the "Safe Handling Practices" Fact Sheet for further information.

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