DuPont™ Teflon®

Industrial Coatings

850-300, 850-314 and 850-321 Two Package PTFE Primers 851-204 Premixed Acid PTFE Primer/One-Coat

Description

850-3XX primers must be activated with acid accelerator 850-7799. 851-204 is a premixed product available for domestic shipment only due to short shelf life at room temperature.

851-204 and the activated 850-3XX products are generally used as primers for other PTFE based topcoats. They can also be used as primers for PFA and FEP topcoats applied in thin films. They are occasionally used as one-coat, dry lubrication finishes. Release, coefficient of friction and other properties are significantly improved if one of the topcoats mentioned above is used.

FDA Status

The 850-3XX line and 851-204 do not comply with FDA regulations in governing components of coatings for direct food contact.

Application

Bring to room temperature, roll or agitate gently, but thoroughly until contents are homogeneous. Do not mix with a propeller type mixer as the material is shear sensitive.

Strain through 100-mesh stainless steel screen. Product may be thinned with distilled or deionized water if desired. Use conventional industrial spray equipment. However, because of the product's acidic nature, use *Teflon*® or other acid resistant containers, equipment and hosing. See "Applying *Teflon*® Coatings" fact sheet.

Table 1
Typical Properties

	PreMixed	Two-Package		
Product Code	**851-204**	**850-300**	**850-314**	**850-321**
Color	Green	Clear	Green	Gray
Weight Solids, %	45.1	51.3	51.6	52.2
Volume Solids, %	27.5	33.8	24.8	32.9
Density (lb/gal)	11.3	11.3	10.8	11.5
(kg/L)	1.4	1.4	1.3	1.4
Coverage (ft^2/gal)*	442	543	423	527
(m^2/L)*	11.0	13.5	10.5	13.1
Viscosity (cP)	50–550	50–400	50–300	50–300
Maximum Continuous Use Temperature	500°F (260°C)			

Note: These figures are averages and may vary.

* Theoretical coverage at 1 mil (25u) assuming 100% application efficiency. For two-package primers, calculation assumes 850-7799 added at recommended amount for a grit-blast surface.

The 850-3XX line products require addition of the accelerator 850-7799. See **Table 2** for details.

NOTE: Use EXTREME CAUTION when handling 851-204, 850-7799 or any 850-3XX product to which 850-7799 has been added. These products are very acidic. See "SAFETY" Section of this Fact Sheet before handling 850-7799.

Stir the primer gently while slowly adding the accelerator. **Do not pour primer into 850-7799**. Do not allow the temperature of the mixture to rise above 100°F (38°C).

Table 2
Accelerator Addition

Product Code	850-3XX	850-7799*	850-7799*
		Grit-blasted surface	Smooth surface
Parts by volume:	100	35	40
Parts by weight:	100	32	36

* Adhesion to substrate can be improved by adding additional accelerator; however, intercoat adhesion will be adversely affected.

Surface Preparation

851-204 and 850-3XX primers are formulated for adhesion to most metals as well as glass, ceramics, etc., that are stable at the baking temperature required. Apply to clean substrate, preferably roughened (e.g., by grit-blasting). Any residual oil on the surface will affect the color of the cured film and will adversely affect adhesion.

Film Thickness

Primer: 0.2–0.4 mil (5–10 microns) DFT

One-coat: 0.5–0.7 mil (13–18 microns) DFT

Bake

Air dry or force dry at less than 180°F (82°C) to drive off volatile substances and excess water. Cure conditions depend on whether the product is used as a primer or a one-coat finish. At least one (primer or topcoat) bake must be at 700°F (370°C) to sinter the PTFE in the primer. Cool before applying topcoat. Do not water quench.

Table 3
Bake Guidelines

	Metal Temperature	Time at metal Temperature
Primer:	450°F (232°C)	15 min
	550°F (288°C)*	3 min
One coat:	750°F (400°C)	10 min

* Intermediate temperatures may be used at corresponding times. Lower bakes (time and/or temperature) will optimize wettability of topcoats. Higher bakes (time and/or temperature) minimize cracking and popping of topcoats.

Oven temperatures may need to be slightly higher.

Storage and Stability

The 850-3XX line primers without 850-7799 accelerator added and the 850-7799 itself have a shelf life of approximately 18 months at 65–75°F (18–24°C). Do not allow products to freeze. Products may be briefly exposed to temperatures outside this suggested temperature range without harm.

Once the 850-3XX and 850-7799 accelerator have been mixed, the mixture should be used within days and stored between uses at 40°F (4°C). If unrefrigerated, the acid/PTFE mixed primer may show evolution of gas and a pressure build-up. Refrigeration is recommended. Use caution opening these containers.

851-204: Refrigerated storage (40°F [4°C]) is recommended. When this is not possible, the following is an indication of shelf life:

Storage Temperature	Approximate Shelf Life
80°F/27°C	2 weeks
60°F/16°C	4 weeks
40°F/4°C	12 months

Irreversible coagulation will occur at temperatures above 80°F (27°C) or if the product freezes. Unrefrigerated 851-204 may show evolution of gas and pressure buildup. Use caution when opening the containers.

Increases in viscosity over time are common and can be reversed to a point by adding deionized or distilled water.

To neutralize acid primers (851-204 (pre-mixed); or 850-300, 850-314, or 850-321 to which 850-7799 has been added) or the accelerator (850-7799), remove the material to a larger, open-neck container and SLOWLY add solid (powder or granular) sodium sulfite (Na_2SO_3, available through any chemical supply house) to the liquid product, stirring constantly to assure the sodium sulfite is well mixed into the product. The chemical reaction will cause heat to be given off. In the case of green products, the color of the liquid will turn from dark to light green (the color of a normal green *Teflon*® cured film). Other colors will take on a greenish color. Continue adding sodium sulfite and stirring until the neutralization is complete (no further color change and no more generation of heat). This indicates sufficient sodium sulfite has been added and mixed in thoroughly. It is better to add too much sodium sulfite than too little.

REMEMBER: The products before neutralization are very acidic and can cause burns to skin or eyes. The neutralization process will cause heat and gas to be generated. ***DO NOT*** *perform the neutralization in the original narrow-neck plastic container since it is difficult to mix thoroughly or prevent rapid generation of fumes and bubbling over from occurring. Face shield and Neoprene gloves and apron should be worn during this procedure, and at all times when handling acidic products.*

Safety

Follow normal industrial safety practices for handling and applying *Teflon*® products. Industrial experience has clearly shown *Teflon*® materials can be processed and used at elevated temperatures without hazard providing adequate ventilation is used. Ventilation should be available at baking temperatures of 525°F (275°C) and above. Before using *Teflon*® read the Material Safety Data Sheet (MSDS) and the detailed information in the “Guide to the Safe Handling of Fluoropolymer Resins,” latest edition, published by the Fluoropolymers Division of The Society of the Plastics Industry. See also “Safe Handling Practices” Fact Sheet, and product label for additional 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.

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