



TPD150

Scratch-Resistant, Clear, Easy-to-Clean Coating



Description

TPD150 is a one-component solution forming highly transparent and clear, thin coating over plastic and glass substrate as a second layer. Based on nanotechnology, the optimized composition of the organic-inorganic matrix provides easy to clean properties with excellent scratch resistance. TPD150 is compatible with various application processes. TPD150 coating provides excellent cleanability, reducing the formation of stains, scratches, and fingerprints. Coating is highly durable to chemical and environmental exposure, including high humidity, UV-light, and temperature changes, without degradation of performance.

Main Applications

- Foldable Displays
- Protective overlays
- Lighting Fixtures / Luminaires

Key features

- Scratch Resistant Hard-Coat
- Easy-to-Clean
- Chemically Resistant
- Cost savings through improved energy efficiency
- Reduced surface reflection

Technical Background

TPD150 is a thin protective layer (40-60 nm thickness) which has been used on top of FleXHC to improve scratch resistance, chemical resistance and easy to clean properties. Thin coatings enhance clarity and transparency of the original substrate due to their tuned optical properties.

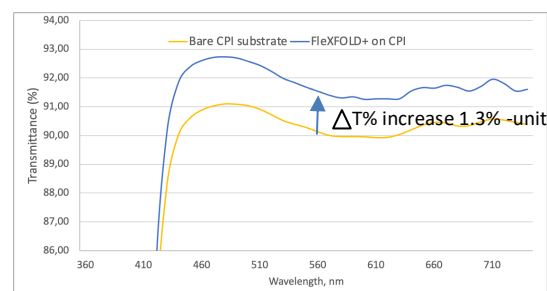
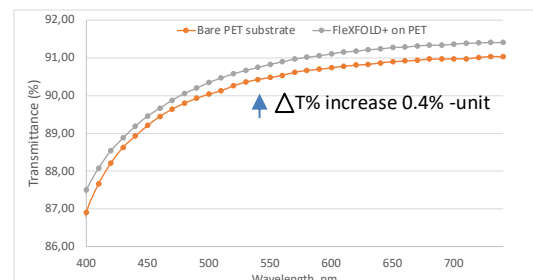
How to Apply

Typical application process for TPD150 is roll-to-roll (R2R) or sheet coating process followed by thermal curing. Coating can be carried out using slot/die, gravure, reverse gravure, Meyer bar or other method. Coated surface should be free from dirt. Plasma or corona pre-treatment may be necessary depending on substrate manufacturer grade.

TPD150

Performance of TPD150 on top of FleXFOLD

Optical Performance	PET (bare)	PET (FleXFOLD+TPD150)	CPI (bare)	CPI (FleXFOLD+TPD150)
Transmittance % at 550 nm	90.4%	90.8%	90.2%	91.7%
Reflectance % at 550 nm	4.8%	4.4%	6.6	4.6
Haze Cmod	0.5	0.5	0.3	0.3
L*	95.4	96.1	95.6	96.9
a*	-0.03	-0.07	-0.7	-0.7
b*	0.6	0.6	2.2	1.9



Graph 1. FleXFOLD + TPD150 increases T% across visible light spectrum on PET and CPI films

Table 1. Optical performance comparison (ASTM D1003)

Mechanical / Physical Performance	No coating	FleXFOLD + (TPD150) (PET)	FleXFOLD + (TPD150) (CPI)	Standard
Pencil Hardness	< 9B	H-2H	4H	ASTM D3363, Elcometer Tester
Adhesion	n/a	5B	5B	ASTM D3359-09, Elcometer crosshatch tester
Foldability	n/a	200 000 cycles - PASS	200 000 cycles - PASS	Outfolding 5 mm (R = 2.5 mm)/Infolding 3 mm (R=1.5mm)
Abrasion Resistance (steel wool)	VERY POOR	No scratches after 2500 cycles Contact angle >100 after 5000 cycles	No scratches after 2500 cycles Contact angle >100 after 5000 cycles	TABER® Linear Abraser - Model 5750 1000 g, 20 x 20 mm abrasant, 2" stroke, 60 cycles per minute
Rubber abrasion	VERY POOR	Contact angle >100 after 10000 cycles	Contact angle >100 after 10000 cycles	Minoan rubber abrasion test, TABER ® Linear Abraser-Model 5750, Minoan rubber 1 kg weight lead, 40 cycles / min, stroke 15 mm
Chemical rubber abrasion	VERY POOR	Contact angle >100 after 10000 cycles	Contact angle >100 after 7000 cycles	Minoan rubber abrasion test, 99,9% ethanol, TABER ® Linear Abraser-Model 5750, Minoan rubber 1 kg weight lead, 40 cycles / min, stroke 15 mm
Water Contact Angle	70°	115°	116°	Mobile surface analyzer, MSA One-Click SFE

Table 2. Mechanical performance of TPD150 on top of FleXFOLD on bare 50 µm PET and CPI film

Solution properties, storage and handling

Solution should be stored below room temperature, preferably +4°C to +25°C, in a well-ventilated place. Changes in the properties of the product may occur if product is stored above indicated temperature for extended periods of time. Keep containers tightly closed and protected from sources of heat and light. Shelf life is in non-opened container 6 months from the date of manufacture. For working safety, consult product Material Safety Data Sheet.

The information given is based on our best knowledge at the date of issue but carries no guarantee or acceptance of responsibility. For further data on products toxicological, ecological and safety aspects, please consult the MSDS. It is the responsibility of the user of the product to ensure to satisfaction that the product is suitable for the intended purpose and methods of use. We do not accept responsibility for any harm caused by the use of this information.