



Technical Information of 4films shield titan thermal

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- Description:** One side matt and scratch-resistant coated, one side EVA coated and corona treated biaxially oriented polypropylene based film for finishing high quality printing products - Processing with commercial thermal laminating machines
- Characteristic:** Extreme matte and special scratch-resistant coating on the surface, optimal resistance against scratching and attrition, high surface tension



Properties	Test Method/Standard	Value	Unit
Thickness	DIN EN ISO 534	28	µm
Substance/Grammage	ISO 536	24.87	g/m ²
Yield	DIN 53375	40.20	m ² /kg
Tensile Strength at Break MD	ASTM D882	57.9	N/mm ²
Tensile Strength at Break TD	ASTM D882	122.9	N/mm ²
Elongation at Break MD	ASTM D882	184	%
Elongation at Break TD	ASTM D882	96	%
Gloss Angle of Incidence/ Observation 60°/60°	ASTM D2457	4.0	GU
Haze	ASTM D1003	91.6	%
Surface Tension	DIN 55660-2	> 44	mN/m

Prior to each and any treatment or processing of the film, the customer is obliged to perform pre-tests under original production conditions in accordance with the form sheet Processing Recommendations. Damages resulting from the fact that the Customer did not or not properly carry out such mandatory pre-tests shall be borne by the Customer.

Explanation of Abbreviations:

ASTM	American Standard Test Method	GE	Gloss Units
DIN	Deutsche Industrie Norm [German Industry Norm]	JIS	Japanese Industrial Standard
DIN EN ISO	German, European and International Standard	MD	Main Direction
		TD	Transverse Direction



Processing Recommendations

4films shield titan thermal

Prior to any treatment or processing of 4films-laminating films they must be tested in each case under the original conditions of production. Due to the great variety of processing machines and their adjustment parameters as well as the variety of materials on the market only recommendations are possible here.

4films shield titan thermal lamination film can be processed with a Kalandar temperature between 100°C and 120°C, but it is recommended to determine the appropriate Kalandar temperature before use.

4films shield titan thermal lamination film should have preferably a temperature less than 30°C and humidity of 55 ± 5 % in storage areas. Storage at high temperatures or in a horizontal position should be avoided. The material should be consumed within three months of receipt.

To avoid damage or consequential costs, the customer has to ensure that when laminating with 4films-laminating films in the event of any defects in the film (eg wrinkling, stains, spots or other imperfections) the production has to be stopped immediately.

When using 4films-laminating films, it has to be verified throughout each job that a sufficient compound adhesion to the substrate to be laminated exists. In case of insufficient

compound adhesion, processing parameters such as pressure, machine speed and temperature should be varied.

In the case that the surface wettability of the substrate to be laminated is particularly poor, the customer might be required to improve the surface wettability beforehand, for instance, without limitation, by use of a corona treatment or to use another laminating procedure.

Prior to any treatment or processing of 4films-laminating film in following methods:

- UV varnishing
- hot foil stamping
- cold foiling
- adhesive bonding
- creasing
- grooving
- blind embossing
- die cutting
- pocket sealing
- pocket welding

it must take place before an suitability test to be used with the original materials under original conditions generally.

