

Autostat

Product data sheet

Heat stabilised polyester film has low residual shrinkage at elevated temperatures. This is essential when tight registration tolerances need to be maintained during multiple printing operations.

PRODUCT DESCRIPTION

Autostat is a high quality stabilised polyester film, with state of the art lay flat and roll formation properties.

It is available in sheets and rolls.

Product Range:

Autostat CT3, CT4, CT5, CT7

Clear, adhesion treated, 75, 100, 125, 175 micron

Autostat CUS5

Clear, untreated, 125 micron

Autostat AHU3, AHU4, AHU5, AHU10

Hazy, untreated, 75, 100, 125, 250 micron

Autostat HT5

Hazy, adhesion treated, 125 micron

Autostat WT3, WT5

Opaque white satin finish, adhesion treated, 125 micron (**see separate data sheet**)

PRODUCT APPLICATIONS

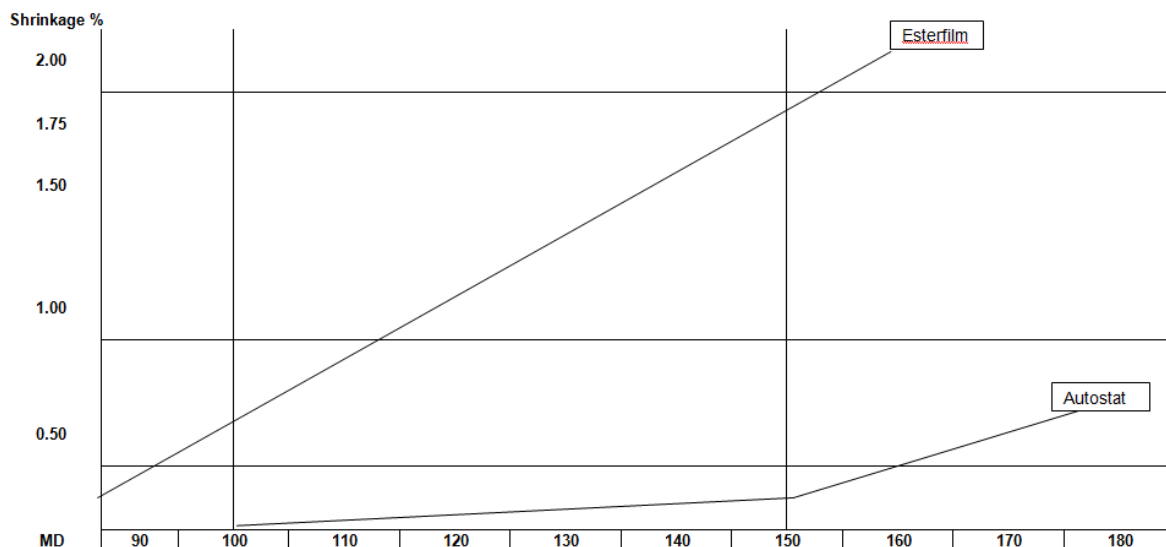
Autostat is used for the manufacture of membrane and conventional switch circuitry layers such as computer keyboards.



PRODUCT PERFORMANCE

Thermal	Autostat	Test Method
Thickness	Dimensional stability	MacDermid Autotype Method ¹
>75 μ	MD \leq 0.2% max @ 150 °C/30 minutes TD \pm 0.08%max @ 150 °C/30minutes	
\leq 75 μ	MD \leq 0.5%max @ 150 °C/30minutes TD \pm 0.1%max @ 150 °C/30 minutes	
	+ indicates expansion - indicates shrinkage	

¹ See Test Method Manual

MD (machine direction) shrinkage versus temperature for 125 μ films**TD (transverse direction) shrinkage at 150°C for 30 minutes**

TD shrinkage is much lower than MD shrinkage and may even be completely absent. When the film does not shrink at all a small positive expansion may take place. A typical result for Autostat would be MD - 0.1% and TD + 0.02%.

INK ADHESION

The adhesion treatment used on the CT and HT grades uses the industry standard chemistry. This treatment enhances adhesion of UV curable dielectric ink, but may not be fully compatible with certain conductive silver inks. See chart below.

Autostat ink adhesion summary

A selection of inks that have been tested in our laboratories are shown in the table below. This list is not comprehensive, but is representative of inks available from named suppliers.



	Treated Autostat	Untreated Autostat
ACHESON		
Conductive Inks		
725A	✓✓	✓✓
PF410 (477SS)	✓	✓✓
418SS	✓✓	✓✓
423SS	✓	x
440A	✓	✓
965SS	x	x
PF407A	✓	✓
Dielectric Inks		
451SS	✓✓	x
452SS	✓✓	✓✓
1020SS	✓✓	x
DUPONT		
Conductive Inks		
5000	✓✓	✓✓
5007E	✓✓	✓✓
5025	✓✓	✓✓
5075	✓✓	✓
7102	✓	x
Dielectric Inks		
5018	✓✓	✓
SUN CHEMICALS		
Conductive Inks		
26-8204	✓✓	x
26-8203	✓	x
Dielectric Inks		
40-317	✓✓	x
ENGLEHARD		
Conductive inks		
S100	✓	✓
S170	x	x
S190	✓✓	✓✓
S200	✓	✓
C1010	x	x
Dielectric inks		
UVD2010	✓✓	✓✓
✓✓	Recommended	
✓	Test fully before use, can be subject to variation	
x	Not recommended	

These results are intended as a guide only. Full in-house testing is essential to ensure success under user conditions.



CHEMICAL PROPERTIES

Property	Autostat	Test Method
Chemical Resistance	As for Autotex (see solvent resistance data sheet)	DIN 42 115
Coefficient of hygroscopic expansion ¹	MD 8×10^{-6} (per 1% RH) TD 7×10^{-6} (per 1% RH)	Base film manufacturer's test method (40-80% RH)
Moisture vapour transmission rate (MVTR) ¹	3.57g/m ² /24 hours	ASTM F372-73
Oxygen transmission rate ¹	8.2ml/m ² /24 hours	ASTM D1434-82 @ 25 °C, 77% RH

¹ This data is typical of polyester films and is derived from base film manufacturer's literature

ELECTRICAL PROPERTIES

Property	Autostat	Test Method
Dielectric strength ¹ 125μ 175μ	125 kV/mm 105 kV/mm	ASTM D149-81 6.35mm electrodes in dry air @ 25 °C
Dissipation factor ¹	0.005	ASTM D150-70
Surface resistivity	$>10^{13} \Omega/\text{sq}$ 500Vd.c	ASTM D257-83 @ 20 °C/54% RH
Volume resistivity ¹	$10^{15} \Omega\text{m}$ 100Vd.c	ASTM D257-83 @ 25 °C/1000s

¹ This data is typical of polyester films and is derived from base film manufacturer's literature

MECHANICAL PROPERTIES

Property	Autostat	Test Method
Elastic modulus ¹ (1% secant) 125μ	3600 N/mm ²	ASTM D882-83 23 °C @ 50% RH Strain rate - 50%/minute
Elongation at break ¹ 125μ	90-120%	ASTM D882-83 23 °C @ 50% RH Strain rate - 50%/minute
Switch life ²	>5 million flexes	MacDermid Autotype Method ³
Tensile strength at break ¹ 125μ	150-220 N/mm ²	ASTM D882-83
Yield strength ¹	80-90 N/mm ²	ASTM D882 - 83

¹ This data is typical of polyester films and is derived from base film manufacturer's literature

³ See Test Method Manual



OPTICAL PROPERTIES

Property	Autostat	Test Method
Gardner Haze	CT3 <1% CT4 <1% CT5 <2% CT7 <3% HT5 16% ±2% CUS5 <2% AHU3 40% ±2% AHU4 43% ±2% AHU5 45% ±2% AHU10 88% ±2%	ASTM D1003-77 ¹
Total luminous transmission	CT 93% ±2% CUS 91% ±2% HT 90% ±2% AHU3 - 5 85% ±2% AHU10 66% ±2%	ASTM D1003 ¹
Yellowness Index	CT <2 CUS <2.5 HT <4 AHU3 – 5 <6 AHU10 <17	ASTM D1925-70 ¹

¹ Adapted to MacDermid Autotype Method, see Test Method Manual

PHYSICAL PROPERTIES

Property	Autostat	Test Method
Density ¹	140g/cm ²	ASTM D1505-79 modified to base film manufacturer's method at 23 °C
Maximum processing temperature	150 °C	
Thicknesses:	Nominal ±5%	All Autostat grades detailed in Product Range

¹ This data is typical of polyester films and is derived from base film manufacturer's literature

² Mean thickness

MISCELLANEOUS

Property	Autostat	Test Method
Roll properties: Skew	<0.1% (10mm in 10m)	



IMDS ID-No 164514418

LEGISLATIVE DIRECTIVES

This product does not knowingly contain any phthalates, or substances listed in the European End-of-Life Vehicles (ELV), Restriction of the use of certain Hazardous Substances in electrical and electronic equipment (RoHS) or Waste Electrical and Electronic Equipment (WEEE) Directives.

EC Regulation 594/91 classifies ozone depleting substances into a number of different groups, I-VI. Autostat does NOT contain any substance classified in groups I-VI nor have any of the substances been used by MacDermid Autotype during manufacture. For details of the content of each of the groups, please see separate ozone depleting substances document

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