MacDermid Autotype
A Platform Specialty Products company

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, and is available in sheets and rolls.

Product Range:

Product	Gauge	Description
Autostat CT	75 µm 100 µm 125 µm 175 µm	Clear, adhesion treated on both sides
Autostat CP[1]	125 µm 175 µm	Clear, adhesion treated on one side, planarised
Autostat CUS	125 µm	Clear, untreated
Autostat AHU	75 µm 100 µm 125 µm 250 µm	Hazy, untreated
Autostat HT[2]	125 µm	Hazy, adhesion treated on both sides
Autostat WT[2]	75 µm 125 µm 250 µm 350 µm	Opaque, white satin finish, adhesion treated on both sides

[1] Specialist products CP7L, CP10L and CPT10L are also available – please see separate data sheets
[2] Please see separate data sheet

PRODUCT APPLICATIONS

Autostat is used for the manufacture of a variety of applications including:

- Flexible circuitry
- Medical diagnostics
- Printed electronics
- FIM graphics
- Sensors

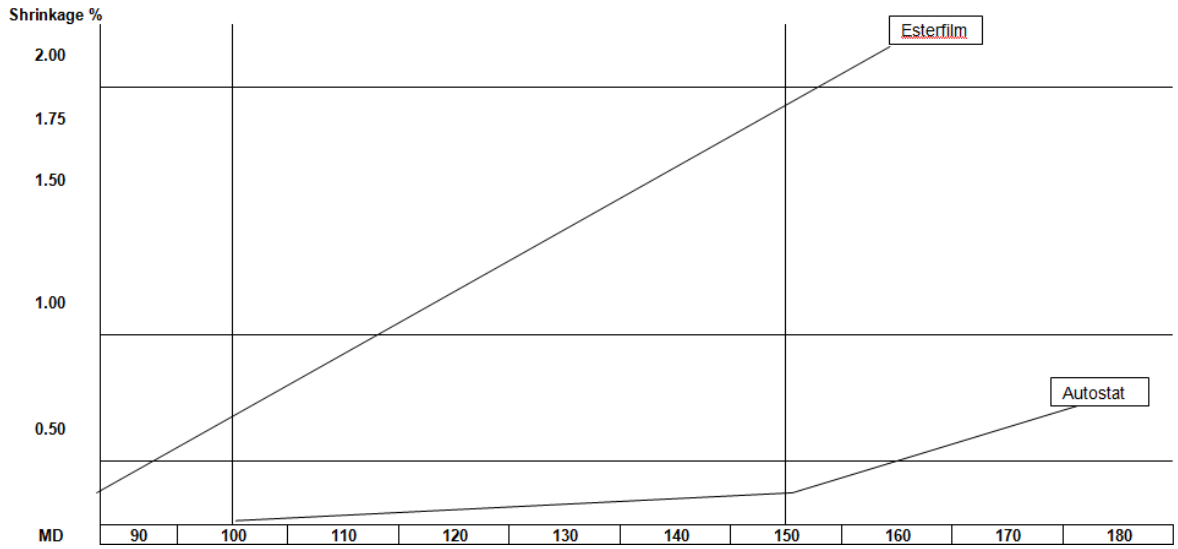
MacDermid Autotype Ltd, Grove Road, Wantage, OX12 7BZ, UK
Tel. +44 (0)1235 771111 – Fax +44 (0)1235 771196
http://www.macdermidautotype.com

PRODUCT PERFORMANCE

Gauge	Specification	Test Method
Thickness	Dimensional stability	MacDermid Autotype Method[1] Based on ASTM D1204
≥ 100µ	MD ≤ 0.2% max @ 150°C/30 minutes TD ±0.08%max @ 150°C/30minutes	
≤ 75µ	MD ≤0.5%max @ 150°C/30minutes TD ±0.1%max @ 150°C/30 minutes	
	+ indicates expansion - indicates shrinkage	

[1] See Test Method Manual

MD (machine direction) shrinkage versus temperature for 125µ films



TD (transverse direction) shrinkage at 150ºC 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, WT and HT grades enhances adhesion of UV curable dielectric inks, but may not be fully compatible with certain conductive silver inks.

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
HENKEL (ACHESON)		
Conductive Inks		
725A	✓✓	✓✓
PF410 (477SS)	✓	✓✓
418SS	✓✓	✓✓
423SS	✓	×
440A	✓	✓
965SS	×	×
PF407A	✓	✓
Dielectric Inks		
451SS	✓✓	×
452SS	✓✓	✓✓
1020SS	✓✓	×
DUPONT		
Conductive Inks		
5000	✓✓	✓✓
5007E	✓✓	✓✓
5025	✓✓	✓✓
5075	✓✓	✓
7102	✓	×
Dielectric Inks		
5018	✓✓	✓
SUN CHEMICAL		
Conductive Inks		
26-8204	✓✓	×
26-8203	✓	×
Dielectric Inks		
40-317	✓✓	×
✓✓	Recommended	
✓	Test fully before use, can be subject to variation	
×	Not recommended	

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

TYPICAL PROPERTIES

Note – these relate to CT, AHU and CUS grades. For other grades please refer to their separate data sheets.

Property	Autostat	Test Method
Chemical Properties		
Chemical Resistance[1]	Chemical resistance of polyester is generally good but has not been extensively tested for circuitry applications	DIN 42 115
Coefficient of hygroscopic expansion[1]	MD 8 x 10^{-6} (per 1% RH) TD 7 x 10^{-6} (per 1% RH)	Base film manufacturer's test method (40-80% RH)
Moisture vapour transmission rate (MVTR) [1]	3.57g/m²/24 hours	Base film manufacturer's test method
Oxygen transmission rate[1]	8.2ml/m²/24 hours	Base film manufacturer's test method
Density[1]	1.4g/cm³	ASTM D1505-79 modified to base film manufacturer's method at 23℃
Electrical Properties		
Dielectric strength[2] CT CUS AHU	 18 – 20 kV 5.8 – 9.4 kV 10 – 19 kV	Base manufacturer's method based on ASTM D149
Physical Properties		
Thicknesses[2]	Nominal ±5%	
Switch life[3]	>5 million flexes	MacDermid Autotype Method
Elongation at break[2] CT CUS AHU	 60 – 80 % 145 % 140 – 210 %	ASTM D882 (23℃ @ 50% RH) Strain rate - 50%/minute
Tensile strength at break[2] CT CUS AHU	 175 – 190 N/mm² 200 N/mm² 190 - 220 N/mm²	ASTM D882
Recommended max processing temperature	150℃	

[1] This data is typical of polyester films and is not specific to any grade of Autostat. It is derived from base film manufacturer's literature
[2] Data derived from base manufacturer's literature
[3] See Test Method manual

Property	Autostat	Test Method
Optical Properties		
Gardner Haze[1]		
CT	<2%	ASTM D1003 [2]
CUS5	<2%	
AHU3	36%	
AHU4	39%	
AHU5	43%	
AHU10	90%	
Yellowness Index[1]		
CT	<2	ASTM E313 [2]
CUS	<2.5	
AHU3 – 5	<6	
AHU10	<17	

[1] Typical values only
[2] Adapted to MacDermid Autotype Method, see Test Method Manual

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

Revision 140417150228ES #5