

AUTOTEX AM

Product Data Sheet

Autotex AM is a high quality, textured polyester film offering Microban® antimicrobial protection on the textured hard coat.

1. PRODUCT DESCRIPTION

The Microban® technology is incorporated into the Autotex textured hard coat during the manufacturing process. This process ensures even distribution of the antimicrobial agent throughout the textured hard coat and the film surface. When bacteria come into contact with Autotex AM with Microban®, the antimicrobial function disrupts the bacterial cell wall killing or inhibiting bacterial growth. The result is that the film surface of Autotex AM provides dependable and constant protection against bacterial contamination.

Product range:

Autotex AM	Fine texture
F157, F207	150 and 200 micron

Primer:

Autotex AM with Microban® has an ink adhesion primer on the second surface. This primer confers excellent adhesion to a wide range of solvent based and UV graphic inks.

Windows:

Autotex AM can be screen printed with Windotex* to obtain a clear window (see Windotex Product Data Sheet).

*NB: Windotex does not offer any antimicrobial protection



2. Product applications

Autotex AM with Microban® is used as a substrate in the following markets:

Markets

Membrane switch overlays
 Surface applications (doors, worktops etc)
 Nameplates
 Labels/Product marking
 Fascia panels

Major Benefits

- ▶ Antimicrobial protection
- ▶ Long flex life
- ▶ Chemical and household cleaner resistance
- ▶ Clear window facility (windows are not antimicrobial)
- ▶ Embossable
- ▶ Excellent scratch resistance
- ▶ Consistent low gloss, textured surface
- ▶ Attractive appearance

3. Antimicrobial Properties

Sample Description	Microbial Testing*	Test Result	Test Method
Autotex AM Unprocessed samples ¹	Antimicrobial effectiveness tested with: Staphylococcus aureus (MRSA) Escherichia coli 0157 Pseudomonas aeruginosa Salmonella enteritidis Bacillus cereus Streptococcus faecalis Klebsiella pneumoniae Aspergillus niger Penicillium purpurogenum Phoma violacea Saccharmyces cerevisiae Listeria monocytogenes	Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass Biocidal Pass	AATCC Test Method 100 ⁷
Simulated printed sample ²	Staphylococcus aureus(MRSA) Escherichia coli 0157	Biocidal Pass Biocidal Pass	AATCC Test 7 Method 100
Simulated wear test ³	Staphylococcus aureus (MRSA) Escherichia coli 0157	Biocidal Pass Biocidal Pass	AATCC Test method 100 ⁷
Simulated embossed sample ⁴	Staphylococcus aureus (MRSA) Escherichia coli 0157	Biocidal Pass Biocidal Pass	AATCC Test method 100 ⁷
15 Year life time test ⁵	Staphylococcus aureus (MRSA) Escherichia coli 0157 Aspergillus niger	Biocidal Pass Biocidal Pass Biocidal Pass	AATCC Test Method 100 ⁷
Ethanol ⁶ IPA MEK Phenol Based Disinfectant Quarternary Ammonium Based Disinfectant Bleach	Staphylococcus aureus (MRSA) Escherichia coli 0157	Biocidal Pass Biocidal Pass	AATCC Test Method 100 ⁷

* The bacteria chosen for each of the tests was recommended by LawLabs



Process Conditions for each Sample

- ¹ Unprocessed Samples: Film samples were tested straight from the pack.
- ² Film samples were subjected to the following tests to simulate graphics printing:
- 10 Jet dryer passes (80°C x 2 mins)
 - 10 Fusion UV passes (500MJ/pass)
 - 5 passes under IR lamps
 - 1 Fusion UV pass (500MJ/pass) - (hard coat surface)
- ³ Film samples were vigorously sandpapered until the texture peaks were removed. The film surface was then polished with wire wool until smooth. This was carried out to simulate extreme surface wear.
- ⁴ Film samples were stretched by 20% in both MD/TD direction. This simulates the process of embossing. (An embossed sample can not be AM tested as a flat surface is required by LawLabs).
- ⁵ Film samples are tested by LawLabs using standard test protocols that simulate real life cleaning regimes representing a period of 15 years. Test Method and certificate available on request.
- ⁶ Film samples were soaked for 24 hours before being subjected to antimicrobial testing.
- ⁷ Test Method available on request.

4. Chemical Properties

Property	Autotex AM	Test Method
Chemical Resistance concerning physical integrity of the coating ²	Resistant to: Turpentine Hydrochloric acid (36%) Diacetone alcohol Butyl acetate Nitric acid (10%) Acetone Sodium Hydroxide (40%) Benzyl alcohol Diesel Lenor/Downey (fabric conditioner) Bleach MEK White spirit Castor oil Acetaldehyde Acetic acid (50%) Acetonitrile Toluene IMS Cyclohexanone	DIN 42 115 Part 2
Coefficient of hygroscopic expansion ¹	MD 8×10^{-6} (per 1% RH) TD 7×10^{-6} (per 1% RH)	DuPont Teijin Films Method ¹ Between 40-80% RH
Moisture vapour transmission rate (MVTR)	3.57g/m ² /24hr	ASTM F372-73
Oxygen transmission rate ¹	8.2ml/m ² /24 hours	ASTM D1434-82 @ 25° C, 77% RH

¹ Data derived from DuPont Teijin Films literature for Melinex OD. The Autotex coating slightly enhances most properties. Autotex AM films have limited long term resistance to UV light and therefore are not recommended for prolonged use outdoors. ² Specific AM testing has not been performed with all of these chemicals. For information on the chemicals tested please refer to the antimicrobial properties section.

5. Electrical Properties

Property	Autotex AM	Test Method
Dielectric strength ¹ 125μ 175μ	125kV/mm = 15.6 kV 105kV/mm = 18.4 kV	ASTM D149-81 6.35mm electrodes in dry air @ 25°C
Dissipation factor ¹	0.005	ASTM D150-70
Surface resistivity	>10 ¹³ Ω/sq 500Vd.c	ASTM D257-83 @ 20°C/54% RH
Volume resistivity ¹	10 ¹⁵ Ωm 100Vd.c	ASTM D257-83 @ 25°C/1000s

¹ Data derived from DuPont Teijin Films literature. The Autotex coating slightly enhances most properties.

6. Mechanical Properties

Property	Autotex AM	Test Method
Elastic modulus (1% secant) 125μ	3600N/mm ²	ASTM D882-88 23°C, @ 50% RH Strain rate - 10%/1 minute
Elongation at break 125μ	80%	ASTM D882-88 23°C, @ 50% RH Strain rate - 50%/minute
Switch life	>5 million flexes	Autotype Method ³
Tensile strength at break 125μm	175N/mm ²	ASTM D882-83
Tensile strength at yield point	100N/mm ²	ASTM D882-88

¹ Data derived from DuPont Teijin Films literature. ² Adapted to Autotype method, see Test method manual ³See Test method manual.

7. Optical Properties

Property	Autotex AM	Test Method
Gardner Haze	55% ±5%	ASTM D1003-77 ¹
Gloss Level (60°)	7% ±0.5%	ASTM D2457-70 ¹
Texture profile Ra	1.6μ ±0.2μm	Autotype Method ²
Rtm	8μ ±2μm	
Total luminous transmission	92% ±0.5%	ASTM D1003-77 ¹
UV absorption	1.3 - 1.4	Autotype Method ² (370nm)
Yellowness index ²	<3	ASTM D1925-70

¹ Adapted to Autotype method, see Test method manual ² See Test method manual

8. Physical Properties

Property	Autotex	Test Method
Density ¹	1.39/cm ³	ASTM D1505
Thicknesses F150 F200	150μ ± 10% 200μ ± 10%	Autotype Method ²

¹ Data derived from DuPont Teijin Films literature for Melinex OD ² See Test method manual

9. Thermal Properties

Property	Autotex	Test Method
Coefficient of thermal expansion ¹	0.002%/degree	DuPont Teijin Films Method
Coefficient of humidity expansion ¹	0.0009%/RH	DuPont Teijin Films Method
Dimensional stability	0.2% maximum shrinkage MD at 120°C	Autotype Method ²
Maximum processing temperature	120°C	
Maximum use temperature	Low humidity (<10%RH) 85°C High humidity (10-95%RH) ≤60°C	
Minimum use temperature	-40°C (-40°F)	Autotype Method ²

¹ Data derived from DuPont Teijin Films literature for Melinex OD ² See Test method manual

10. Ozone depleting substances

EC Regulation 594/91 classifies ozone depleting substances into a number of different groups, I-VI. Autotex 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.

The information and recommendations in this publication are believed to be accurate and are offered in good faith but do not constitute specifications. Suggestions concerning uses and applications are only the opinion of MacDermid Autotype Limited and users should carry out their own testing procedures to confirm suitability for their purposes. Except in the case of death or personal injury caused by the materials, MacDermid Autotype Limited **MAKES NO WARRANTY OF ANY KIND AND EXCLUDES ANY STATUTORY WARRANTY EXPRESS OR IMPLIED** other than that materials conform to their current applicable standard specification. Statements herein therefore should not be construed as guarantees of satisfactory quality or fitness for purpose. The responsibility of MacDermid Autotype Limited for claims arising out of breach of guarantee, negligence, strict liability or otherwise is limited to the purchase price of the material.

Suggestions concerning working practices and procedures are based on the practices adopted by existing users of the products and are made in good faith. **IT IS THE RESPONSIBILITY OF THE USER TO ENSURE THAT ALL RELEVANT HEALTH AND SAFETY LAWS AND REGULATIONS ARE COMPLIED WITH.** MacDermid Autotype Limited does not provide any advice on such laws and regulations and accepts no responsibility, express or implied, for breach of such regulations.

Statements concerning the use of products described herein should not be construed as recommending the infringement of any patent and no liability for infringement arising out of such use is assumed.

January 2007

