MacDermid Autotype
A Platform Specialty Products company

GATGARD®Autotex AM

Product Data Sheet

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

* The term polyester is the generic term for a number of different polymers, of which polyethylene terephthalate (PET) is the most common. PET is used in MacDermid Autotype Industrial Polyester film products.

PRODUCT DESCRIPTION

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	F157, F207
Fine texture	150 and 200 micron

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

Polyester films with high gloss surfaces are prone to blocking when stored with the film surfaces touching each other. Blocking is the term given when two surfaces adhere or merge into each other and when separated leave immovable marks on the film. For this reason we recommend that users make sure that the non-textured (ink primer) surfaces are not left in contact with each other for extended periods of time.

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

PRODUCT APPLICATIONS

Autotex AM with Microban® is used as a substrate in the following applications:
Membrane switch overlays
Surface applications (doors, worktops etc)
Nameplates
Labels/Product marking
Fascia panels

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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

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 Stretococcus faecalis Klebsiella pneumoniae Aspergillus niger Penicillium purpurogenum Phorma 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	 AATCC Test Method 100[7]
Simulated printed sample[2]	Staphylococcus aureus (MRSA) Escherichia coli 0157	Biocidal Pass Biocidal Pass	AATCC Test Method 100[7]
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 an Independent Test House

Autotex AM films have limited long term resistance to UV light and are not recommended for prolonged use outdoors.

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 cannot be AM tested as a flat surface is required by I an Independent Test House).

[5] Film samples are tested by an Independent Test House 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.

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 Caster Oil Acetaldehyde Acetic acid (50%) Acetonitrile Toluene IMS Cyclohexanone	DIN 42 115 Part 2
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 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] Data derived from base film manufacturer's literature. The Autotex coating slightly enhances most properties.

[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.

ELECTRICAL PROPERTIES

Property	Autotex AM	Test Method
Dielectric strength[1] 125µ 175µ	15.6kV 18.4kV	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 @ 25V°C/1000s

[1] Data derived from base film manufacturer's literature. The Autotex coating slightly enhances most properties.

MECHANICAL PROPERTIES

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

[1] Data derived from base film manufacturer's literature .
[2] Adapted to MacDermid Autotype Method, see Test Method Manual.
[3] See Test Method Manual.

OPTICAL PROPERTIES

Property	Autotex AM	Test Method
Gardner Haze	58% ±5%	ASTM D1003-77[1]
Gloss Level (60°)	7% ±1.5%	ASTM D2457-03[1]
Texture profile Ra Rtm	 1.6µ ± 0.2µm 8µ ± 2µm	MacDermid Autotype Method[2]
Total luminous transmission	92% ± 0.5%	ASTM D1003-77[1]
UV absorption	1.3 - 1.4	MacDermid Autotype Method[2] (370nm)
Yellowness index[2]	<3	ASTM E313

[1] Adapted to MacDermid Autotype Method, see Test Method Manual.
[2] See Test Method Manual

PHYSICAL PROPERTIRES

Property	Autotex AM	Test Method
Density[1]	1.39g/cm^3	ASTM D1505
Thicknesses F157 F207	 150µ ±10% 200µ ±10%	MacDermid Autotype Method[2]

[1] Data derived from base film manufacturer's literature [2] See Test Method Manual

THERMAL PROPERTIES

Property	Autotex AM	Test Method
Coefficient of thermal expansion[1]	0.002%/degree	Base film manufacturer's test method
Coefficient of humidity expansion[1]	0.009%/%RH	Base film manufacturer's test method
Dimensional stability	0.2% maximum shrinkage MD at 120°C	MacDermid 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)	MacDermid Autotype Method[2]

[1] Data derived from base film manufacturer's literature. [2] See Test Method Manual.

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. Autotex AM 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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