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Version #2 (0417)

Approved by J. S.

Product: Permacolor® PermaPrint® SAG 175
Anti-Graffiti and Window Protection Film

Permacolor

The **Permacolor** system is a series of pressure sensitive products for mounting and overlaminating in the graphic imaging industries. Pressure sensitive **Permacolor** provides fast, efficient processing through cold roll lamination techniques without the need for heat, drying or messy coating operations.

Product Description

The **PermaPrint SAG Series of Superior Anti-Graffiti and window protection films** are a family of pressure sensitive adhesive coated, **optically** clear, overlaminating films that are available in 'good, better, best' quality options.

SAG 175 ('best' option) is a 6.9 mil hard coated, high gloss and ultra-clear, durable polyester face with excellent graffiti, UV and abrasion resistance. It has an optically clear, acrylic, pressure sensitive adhesive protected by a 1.4 mil smooth PET film release liner.

SAG 175 can be laminated to photographic prints, transparencies, latex, solvent-, eco-solvent, water-based and UV inkjet prints, and UV screen printed images to impart superior protection for your graphics from graffiti, abrasion, UV light degradation, dirt, moisture and many other potentially damaging effects in both indoor and outdoor environments. **SAG 175** meets **ANSI Z26.1** for use in private or public transport vehicles and areas (trains, subways, tramways, buses...) that require graffiti and window protection.

SAG 175 also increases **the impact resistance** of windows. (*Note: For safety reasons (emergency exits), it is important to keep some windows unprotected*). **SAG 175** can be wet applied directly to windows and mirrors or first **laminated** to a pressure sensitive print media and then applied onto flat surfaces.

SAG 175 has **superior solvent resistance**, so if tagged, the graffiti can be easily cleaned off using most commercially available graffiti removing cleaners without damaging the graphic.

NOT RECOMMENDED FOR: Application on riveted, embossed or curved surfaces. The edges of the product could be affected in the case of frequent contact with solvents. Mactac recommends edges sealing if this is a concern.

Physical Properties

Property	Typical Values	Test Method
Thickness, inches (µm) Film plus adhesive	0.0079 (200)	ASTM D2103 (ISO 536)

Peel Adhesion lb./in. (N/25mm) Stainless Steel - 20 min - 24 hr.	3.6 (16) 4.5 (20)	PSTC – 101 (FTM-1)
Quick Tack, lb./in² (N/25mm) Stainless Steel	2.5 (11)	FTM 9 (MACTac CTM-25)
Dimensional Stability, (%) MD CD	< 0.2 < 0.2	FTM 14 (Mactac CTM-2) (Method D) 48 hours @ 158°F (70°C) Bonded to aluminum
Shear, Hours to fail Stainless Steel – 2.2 lbs. @ 72°F (22°C)	150	PSTC - 7
Temperature Range Application: End Use:	50° to 104°F (10° to 40°C) -40° to 194°F (-40° to 90°C)	
Adhesive pH	Neutral	TAPPI-529
Face Tensile Strength (K/psi) Elongation @ Break (%)	28 160	ASTM D-882A
Resistance to Temperature Change:	No cracking, delamination, clouding or deterioration	ANSI Z26.1 Test #22
Luminous Transmittance:	- 87.7%	ANSI Z26.1 Test #2
Abrasion Resistance: 500g/wheel, 100 cycles' w/SC10Fwheel	% change: 3.4	ANSI Z26.1 test 17 (ASTM D1003)
Light Stability (UV Resistance): After 1600 hours loss of light transmittance:	1.1%	ANSI Z26.1 test 24 - ref. test 5.11 ISO 4892-2 (spec. < 5% change)
Flammability: Smoke Emission:	Flame index = 5 Flaming mode non-flaming mode 1.5min. 4 1 4.0 min. 48 2 Optical Density 138 92	ASTM E162-13 ASTM E662-13c
Humidity Test:	No evidence of either material separation or spots.	ANSI Z26.1 Test #3
Bombardier Toxic Gas:	Flaming mode non-flaming mode CO max 690 121 CO ₂ max 11023 410 NO ₂ <1 <1 SO ₂ <1 <1 HCl 35 31 HF 2 <2 HBr <1 <1 HCN <1 <1	SMP800c Rev. 6 (ppm)

Durability

The durability of the film is up to 2 years outdoors and 10 years indoor. While all Permacolor overlaminating films have UV resistance built in to help extend the life of your image, the durability of the image is mainly dependent upon the quality of the inks (see technical data sheets given by the ink manufacturers) and pressure sensitive media being used.

Shelf Life

Two years when stored at 75°F (24°C) and 50% relative humidity or less. Note: Mactac recommends that rolls be stored on end or suspended from the core.

Chemical Resistance (ANSI Z26.1 test #14 non-stressed)

Resistant to non-abrasive soaps, denatured alcohol, water, detergents and most diluted acids and alkalis. It is not affected by short term contact with most of aliphatic and aromatic hydrocarbons, ketones, esters, chlorinated hydrocarbons and alcohol

Limitations

- 1) The user is responsible for determining the product's suitability, including adhesion and if needed, removal characteristics when used in applications other than listed specifically in this Performance Guide.**
- 2) If there are any questions about applications, please contact your Mactac sales representative to discuss your requirements for recommendations.**
- 3) If this is a printed Performance Guide it is an uncontrolled document. Please check the Mactac website for the latest, most up-to-date version.**

Recommendations

- Where exposure to moisture, chemicals, solvents or high pressure wash is anticipated, Mactac recommends sealing the edges with varnish, silicone or other sealant to prevent penetration by these liquids.
- The addition of heat while simultaneous mounting with Thermal Overlaminates may result in curl or have other detrimental effects on the finished product.
- Whenever possible, always test first to ensure end-use capability.

PROCESSING:

LAMINATION:

- Mactac recommends laminating SAG 53 to your printed graphics with a professional laminator. Overlaminates should not be applied onto dusty or dirty prints.
- Mactac's pressure sensitive mounting films are intended for "Cold Roll Lamination" (40°F - 104°F).

APPLICATION:

- Wet application method is recommended when used as a window protection film. We recommend using professional window application squeegees for a perfect application. Ref: TA2111 for proper installation instructions!

MAINTENANCE & CLEANING:

- SAG films can be easily cleaned off using most commercially available window cleaners or and graffiti removing cleaners without damaging the graphic.

- *Values given are typical and are not necessarily for use in specification.*

CALL 1-800-321-8834 for additional product information



IMPORTANT NOTICE: The information given and the recommendations made herein are based on our research and are believed to be accurate, but no guarantee of their accuracy or completeness is made. In every case, user shall determine before using any product in full scale production, or in any way, whether such product is suitable for user's intended use for their particular purpose under their own operating conditions. User assumes all risk and liability whatsoever in connection with their use of any product. The products discussed herein are sold without any warranty as to merchantability or fitness for a particular purpose, or any other warranty, express or implied. No representative of ours has any authority to waive or change the foregoing provisions, and no statement or recommendation not contained herein shall have any force of effect unless in an agreement signed by the officers of seller and manufacturer. Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute a permission, inducement or recommendation to practice any invention covered by any patent without authority from the owner of the patent. The following is made in lieu of all warranties, express or implied: Seller's and manufacturer's only obligation shall be to replace or credit such quantity of the product proved to be defective at its discretion.

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