

Version #5 (0817)  
Approved by J. S.

## Product

MACmark MACCrystal® 8400  
Transparent Vinyl Series

## Product Description

MACmark MACCrystal 8400 is a **glossy transparent** film with up to 3 years outdoor durability. This 3-mil cadmium free vinyl is available in bright, consistent, transparent colors, which can be further combined to create nearly any color imaginable. The film is coated with a durable, permanent acrylic, pressure sensitive adhesive with excellent wet-out characteristics for clarity. An 83# white kraft liner offers excellent stability and layflat. The product has good dimensional stability and is designed for excellent cutting and weed ability.

## Physical Properties

Property	Typical Values	Test Method
<b>Thickness in inches</b> Film plus adhesive	0.0042 (105)	ISO 534 (ASTM D-645)
<b>Peel Adhesion</b> 180° on Stainless Steel - 20 min. - 24 hr. - 1 week	3.2 (14) 4.1 (18) 4.4 (19)	FTM-1 (ASTM D-903)
<b>Face Material Data</b> <b>68°F (20°C)</b> Tensile strength lb. /in. (N/m) Elongation % at break	≥11.0 (30) ≥150%	DIN 53455
<b>Dimensional Stability</b> <b>(shrinkage) in Percent</b>	<0.05 (0.127)	48 hours @ 158°F (70°C) Bonded to aluminum
<b>Temperature Ranges</b> Application: End Use:	50° to 104°F (+10° to 40°C) -40° to 158°F (-40° to 70°C)	
<b>Flammability</b>	Self-extinguishing	ISO 3795

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

## Durability

Indoors and up to 3 years outdoors. This use-life estimate is based upon accelerated age studies. Please note that outdoor exposure to severe temperatures, ultra-violet light and also tropical, sub-tropical or desert regions will cause more rapid deterioration. This also applies to polluted areas, high altitude and south facing exposure.

## Printability

Printability is not warranted. However, we have created the following guidelines if printing is desired:

- 1) For **screen printing**: Limit the screen ink to two or three colors. While the liner is an excellent liner, it is designed for plotter cutting. Sometimes too much heat may result in the liner 'waving' a little which can cause registration issues when additional colors are used. Mactac recommends Nazdar 3500 series UV cured screen inks.
- 2) If printing **UV inkjet**; make sure the vacuum (if flatbed) is strong enough to hold the liner down tight. Typically it is, but vacuums are notoriously weak, especially as they age.
- 3) If printing with **solvent inks**; limit the inks to a total of 270% saturation. Use a generic ICC profile for either 2 mil cast or 3.5 mil calendared vinyl films as a starting point.
- 4) **Thermal transfer** printing: all MACmark **gloss** films are thermal transfer printable. We strongly recommend the use of a web cleaner prior to printing due to the potential presence of paper dust from the white kraft paper liner.

## Shelf Life

Two years when stored at 60°F - 75°F (15°C - 25°C) and 50% relative humidity.

## Chemical Resistance

The film was adhered to an aluminum substrate 24 hours prior to testing. Samples were immersed in each of the following chemicals and later observed for adhesion.

Chemical	Time Immersed	Observation
Water	24 hours	Excellent
5% Detergent	24 hours	Excellent
10% Hydrochloric Acid	24 hours	Excellent
10% Sulfuric Acid	24 hours	Excellent
10% Phosphoric acid	24 hours	Good
10% Ammonium Hydroxide	24 hours	Excellent
Methanol	1 hour	Good

## Application Tips

- 1) Application of MACal 8400 is made easier if MACtransfer® tape is used. MACtransfer 210 for medium to large graphics and MACtransfer 220 for small letters and fine lines.
- 2) Transfer the cut decal to the Application Tape by removing the liner from the decal, not the decal from the liner.
- 3) Where exposure to chemical and solvent spills is likely to occur, edge sealing of decals with varnish or clear coat will prevent edge lift.
- 4) Correct varnishing of decals gives greater protection and longer end-use life against any prolonged effect of weathering, abrasion or other corrosive effects such as frequent cleaning.
- 5) We recommend wet application methods on flat surfaces.

## Important Notice

Care should be taken when selecting a substrate for use in illuminated devices when using pressure sensitive materials. Some substrates, e.g. polycarbonate, can cause problems due to bubbling (outgassing). We recommend testing for compatibility of 8400 vinyl film with the application surface.

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