

## Description

Quick-Mark Digital consists of a printable Laser Film, Base Sheets and optional Over-Laminating films. The Laser Film is heat stabilised and includes a UV inhibitor to protect against fading and has a double sided coating to accept Laser Toner. Vinyl Base Sheets are available in white and transparent and there is 0.2mm aluminium available. All Base Sheets have a cross-linked acrylic adhesive on both sides. The self-adhesive optional clear Over-Laminating films are available as a clear or matt PVC vinyl and a Polycarbonate.

## Quick-Mark Digital Laser Film

QMD Laser Film is a 100 micron base polyester film. This 140g/m<sup>2</sup> film produces high density images when used with a host of colour and mono laser printers. The film features UV inhibitors and a toner receptive coating on both sides of the base polyester. For the purposes of the various tests detailed in this document an HP colour LaserJet CP5220 A3 printer was used with HP proprietary toner.

***In all cases, all statements, technical information and recommendations herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith***

## Plastic Base Sheets *all base sheets have a double sided acrylic adhesive.*

Superior quality, soft polymeric 75 micron (50 micron for 800-502 series Silver) vinyl films using the latest advances in PVC and pigment technology to offer improved dimensional stability and excellent long term durability. The wide range of light fast colours are suitable for long term interior or exterior applications of an outdoor exposure of 5-7 years.

<b>Make up</b>	75 micron vinyl Adhesive Base - 30 micron base clear, permanent cross linking acrylic adhesive with 137 gsm plain projected Kraft Release Liner. Adhesive Top Face - 40 micron base clear, permanent cross linking acrylic with 100 micron clear polyethylene liner.
<b>Storage</b>	Three years from packing date out of direct sunlight at 15°C to 25°C and 50% humidity.
<b>Tensile (Min.)</b>	25.ON/mm <sup>2</sup> (Test method DIN 53445)
<b>Elongation (Min.)</b>	250% (Test method DIN 53445)
<b>Dimension Stability</b>	150 x 150mm 48 hours/70°C FINAT FT 14 Aluminium <0.5mm
<b>Flammability</b>	SELF EXTINGUISHING
<b>Weathering</b>	White 7 years Other colours 5 years
<b>Application Temp.</b>	Clean dry surface, +2°C to +50°C
<b>Service Temp.</b>	Clean dry surface, -40°C to +90°C
<b>Base/Rear Adhesion</b>	20 Mins/90° FINAT FT 1/Stainless Steel = 520N/Metre 20 Mins/180° FINAT FT 1/Stainless Steel = 620N/Metre 24 Hours/90° FINAT FT 1/Stainless Steel = 700N/Metre 24 Hours/180° FINAT FT 1/Stainless Steel = 900N/Metre Static Shear (25 x 25mm) FINAT FT 8 Stainless Steel > 16 hours.
<b>Top Face Adhesion</b>	Quick Tack (N/25mm) on stainless steel average value 16 (FTM 9) Peel 180° - 30 min (N/25mm) on stainless steel average value 13 (FTM 1) Shear 1KG 25 x 25mm > 500 hours (FTM 8)

**Chemical Resistance** The following tests were carried out on the base film. A sample was prepared by applying the film to an aluminium panel at 23°C and conditioning 24 hours prior to testing by immersion in the solutions. After a fixed period of time the sample is removed, dried and examined for adhesion one hour after test.

Solution/Reagent	Exposure	Results / Observations
Humidity	300 hours	No effects
Water	24 hours immersion	No effects
Sea Water	1 year mid tide BS5609	No effects
Diesel Fuel	24 hours immersion	No effects
Anti Freeze/water	24 hours immersion	No effects
Reference Fuel	1 hr immersion	Very slight film softening
SAE Motor Oil	24 hours immersion	No effects
Detergent Solution (65°C)	8 hours immersion	No effects

Please read notes pertaining to tests at the end of this data sheet.

## Aluminium Base Sheets

High quality mill finish 0.2 mm aluminium.

<b>Make up</b>	1050 Alloy, Hard Temper. Double sided adhesive - both faces - 40 micron clear, permanent cross linked acrylic adhesive with 100 micron clear polyethylene liner.
<b>Storage</b>	Two years from packing date out of direct sunlight at 15°C to 25°C and 50% humidity.
<b>Application Temp.</b>	Clean dry surface, +2°C to +50°C
<b>Service Temp.</b>	Clean dry surface, -30°C to +90°C
<b>Adhesion (both faces)</b>	Quick Tack (N/25mm) on stainless steel average value 16 (FTM 9) Peel 180° - 30 min (N/25mm) on stainless steel average value 13 (FTM 1) Shear 1KG 25 x 25mm > 500 hours (FTM 8)

## Over-Laminating Films

A matt and gloss over-laminating film are available. Both have a single sided acrylic adhesive and are designed to provide extra protection to a Quick-Mark™ label where the Imaging Film emulsion is left exposed on the top surface.

The matt film can also be used to change the aesthetic appearance of a finished label to a matt anti-reflective appearance.

### Gloss

**Make Up** The material and specification is the same as the transparent Base Sheet expect it does not have a top surface adhesive.

### Matt

**Make Up** A matt 70 micron PVC film with 25 micron of acrylic adhesive protected by a yellow 90g/m<sup>2</sup> yellow Kraft paper. The film has a matt appearance with anti-reflective properties.

**Storage** Two years from packing date at 15°C to 25°C and 50% humidity.

**Application Temp.** Clean dry surface, +5°C to +40°C  
**Service Temp.** Clean dry surface, -30°C to +90°C

**Adhesion** Quick Tack (N/25mm) on stainless steel average value 4 +/- 1 (FTM 9)  
Peel 180° - 30 min (N/25mm) on stainless steel aver. value 2.5+/-1 (FTM 1)  
Shear 1KG 25 x 25mm > 100 hours (FTM 8)

**Chemical Resistance** The following tests were carried out on the base film. A sample was prepared by applying the film to an aluminium panel at 23°C and conditioning 24 hours prior to testing by immersion in the solutions. After a fixed period of time the sample is removed, dried and examined for adhesion one hour after test.

Solution/Reagent	Immersion Time	Results / Observations
Water	24 hours	Excellent
5% Detergent	24 hours	Excellent
10% Sulphuric Acid	24 hours	Excellent
10% Phosphoric Acid	24 hours	Good
10% Sodium Hydroxide	24 hours	Excellent
10% Ammonium Hydroxide	24 hours	Excellent

Ethylene Glycol	24 hours	Excellent
Methanol	1 hour	Good

Please read notes pertaining to tests at the end of this data sheet.

## Environmental Performance Testing



### Material submitted for Testing

A reverse printed image was produced on QMD Laser Film via a HP colour LaserJet CP5220 A3 printer, loaded with proprietary HP toner. The printed images were adhered to 800-500 White Base Sheets and the label stuck to an aluminium backing plate. Various samples 70mm x 190mm, 70mm x 150mm and 100mm x 100mm were produced each consisting of the Mega Logo and bands of red, yellow, green, black, blue, orange and light blue colour. Each panel was covered by approximately 50%, by a piece of 800-600 Gloss Over-Laminating Film.



## Chemical Resistance

6 of the 70mm x 190mm labels were subjected to chemical resistance in accordance with BS EN ISO 2812-4 (spotting method). The labels were exposed to water, mineral oil, industrial methylated spirit, white spirit, base at pH10 and acid at pH 4 for 4 hours. The method was modified slightly for the volatile methylated spirit by soaking a piece of filter board and applying this to the surface.

### Chemical Resistance Results

Reagent	Appearance
Water	No change
Mineral Oil	No change
Industrial Methylated Spirit	Softening of unlaminated surface leading to marring upon removal
White Spirit	No change
Base at pH 10	No change
Acid at pH 4	Very light abrasion of unlaminated surface upon removal

## Temperature Resistance

70mm x 190mm labels were subject to freeze-thaw testing consisting of 7 cycles of 8 hours to -20°C.

70mm x 190mm labels were subject to 80°C for 2 hours.

70mm x 190mm labels were subject to 90°C for 2 hours.

70mm x 190mm labels was not reversed printed (toner on top) and over-laminated with 800-600 Gloss Laminating Film was subject to 90°C for 2 hours.

At the end of test cycles the labels were visually examined and adhesion of the labels to the aluminium panel was tested by trying to peel off the label by hand.

### Temperature Resistance Results

No apparent loss of adhesion on any label.

No apparent change in appearance to the freeze-thaw labels (-20C)

No apparent change in appearance to the label tested to 80°C

Softening of colours and slight mottled appearance to the label tested to 90°C. Close examination showed the change in appearance to be due to find porosity in the toner.

No apparent change in appearance to the label that was not reversed printed (toner on top) and over-laminated with 800-600 Gloss Laminated film that was tested to 90°C.

## Abrasion Resistance

The 100mm x 100mm self-adhesive labels were mounted to steel backing plates and subjected to Taber abrasion testing in accordance with BS EN ISO 7784-2, using CS17 wheels each with a load of 1000g. The weight loss was determined after 750 cycles.

### Abrasion Resistance Results

Panel	Weight loss (mg)	Appearance
1	44	Surface abrasion during testing has caused loss of gloss and softening of the colours. The effect is similar for both the laminated and unlaminated
2	36	

### **Resistance to Humidity**

3 of the 70mm x 190mm labels were subjected to a controlled environment of 32°C and 95% RH for 72 hours. At the end of this period the panels were visually examined and adhesion of the labels to the aluminium panel was tested as for the temperature resistance samples.

### **Resistance to Humidity Results**

The panels showed no change in colour or gloss upon completion of testing, with no apparent loss of adhesion

### **Salt Spray**

3 of the 70mm x 190mm labels were exposed to neutral salt spray in accordance with BS EN ISO 9227 for 48 hours. At the end of this period the panels were visually examined and adhesion of the labels to the aluminium panel was tested as for the temperature resistance samples.

### **Salt Spray Results**

The panels showed no change in colour or gloss upon completion of testing, with no apparent loss of adhesion.

### **Artificial Weathering**

The 70mm x 150mm samples were subjected to QUVA exposure in accordance with BS EN ISO 11507 using UVA 340 lamps and a weathering cycle of 4 hours condensation at 50°C followed by 4 hours UV exposure at 60°C. The panels were exposed for 1000 hours with an intermediate inspection at 500 hours.

### **Artificial Weathering Results**

The unlaminated areas of the labels showed loss of gloss and softening of the colours due to surface mottling after 500 hours exposure, with little further change after 1000 hours.

The gloss and colour of the laminated areas appear unaffected.

Although the amount of UV light in natural weather conditions varies immensely 500 QUVA exposure has been previously attributed to 15 months UK natural exposure (45° facing South)

### **Test Notes**

1. FTM denotes FINAT test methods, which are used as standards throughout the European adhesive labelling industry. FINAT is short for:  
FÉDÉRATION INTERNATIONALE DES FABRICANTS ET TRANSFORMATEURS D'ADHÉSIFS ET THERMOCOLLANTS SUR PAPIERS ET AUTRES SUPPORTS.
2. In all cases, all statements, technical information and recommendations herein are based on tests we believe to be reliable, but the accuracy or completeness thereof is not guaranteed, and the following is made in lieu of all warranties of merchantability and fitness for purpose:  
Sellers and manufacturers only obligation shall be to replace such quantity of the product proved to be defective. Before using, user shall determine the suitability of the product for its intended use, and user assumes all risk and liability whatsoever in connection therewith. NEITHER THE SELLER NOT MANUFACTURER SHALL BE LIABLE EITHER IN TORT OR IN CONTRACT FOR ANY LOSS OR DAMAGE, DIRECT, INCIDENTAL, OR CONSEQUENTIAL, ARISING OUT OF THE USE OF OR THE INABILITY TO USE THE PRODUCT. No statement or recommendation not contained herein shall have any force or effect unless in an agreement signed by officers of seller and manufacturer.

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