

Quick-Mark® Specifications

Issue date: September 17, 1999 (updated June 2003)

Description

Quick-Mark® consists of Imaging Films, Base Sheets and Over-Laminating Films. The Imaging Film is available in seven different colours and the vinyl Base Sheets in eight colours, transparent and 0.2mm aluminium. All Base Sheets have double sided acrylic adhesive. Imaging film consists of a coloured emulsion on a transparent polyester carrier and is exposed to UV and the image processed via a dry peel technique - no developer.

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

Superior quality, soft polymeric 75 micron 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.

Make up	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 - 30 micron base clear, permanent cross linking acrylic with 100 micron clear polyethylene liner.
Storage	Three years from packing date out of direct sunlight at 15°C to 25°C and 50% humidity.
Tensile (Min.)	25.ON/mm ² (Test method DIN 53445)
Elongation (Min.)	250% (Test method DIN 53445)
Dimension Stability	150 x 150mm 48 hours/70°C FINAT FT 14 Aluminium <0.5mm
Flammability	SELF EXTINGUISHING
Weathering	White 7 years Other colours 5 years
Application Temp.	Clean dry surface, +2°C to +50°C
Service Temp.	Clean dry surface, -40°C to +90°C
Base/Rear Adhesion	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.
Top Face Adhesion	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.

Make up	1050 Alloy, Hard Temper. Double sided adhesive - both faces - 40 micron clear, permanent cross linked acrylic adhesive with 100 micron clear polyethylene liner.
Storage	Two years from packing date out of direct sunlight at 15°C to 25°C and 50% humidity.
Application Temp.	Clean dry surface, +2°C to +50°C
Service Temp.	Clean dry surface, -30°C to +90°C
Adhesion (both faces)	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/m² 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.

Imaging Films

Seven different colours are available. The film consists of a coloured emulsion sandwiched between two layers of transparent polyester carrier film, 50 microns top film, 76.2 microns bottom film.

Storage Two years from packing date at 21°C - 24°C and 30% - 70% relative humidity. Avoid conditions exceeding 32°C and 70% relative humidity.

Application Temp. Clean dry surface, +2°C to +50°C

UV Ageing UV ageing tests on unexposed Imaging Films
 White 1 year - some colour loss.
 Other colours 5 years - no noticeable colour loss.

UV ageing tests on processed samples - test data below under
 Environmental Performance Testing

Dimensional Stability	Specification	Test Method
Shrinkage 150°C 30 minutes	(%) <3.0MD/2.0TD	ASTM D 1204-78

Environmental Performance Testing

Labels with Imaging Film and labels with Imaging Film and Over-Laminating Film were tested.

Chemical Resistance

The samples were subjected to a chemical resistance test in accordance with ISO 2812 part 1 Method 3 (spotting method) using the following materials: water, mineral oil, industrial methylated spirits, white spirit, base at pH 10 and acid at pH 4. The materials were left in contact with the labels for a period of 4 hours at a temperature of 23°C. The method was modified by soaking a piece of filter board with the methylated spirit applying this to the surface of the label. This was because of the volatility of the methylated spirit. All the other test methods were applied as liquids. All materials were covered to prevent evaporation. After 4 hours the test liquids were removed with a soft cloth and the labels examined.

Test		Plastic Label	Aluminium Label
Chemical Resistance 4 hour dwell	Water	No effect	No effect
	Oil	No effect	No effect
	Base pH 10	No effect	No effect
	Acid pH 4	No effect	No effect
	Alcohol	No effect	No effect
	White Spirit	No effect	No effect

Temperature Resistance -23°C to 90°C

The samples were exposed for 7 days to temperatures varying from -23°C to 90°C. At the end of the exposure period they were examined visually for damage to the label. The adhesion to the aluminium panel was tested and compared to a control sample kept at room temperature.

Test		Plastic Label	Aluminium Label
Temperature resistance 7 day exposure	-23°C to 90°C	No sample showed detrimental effects or loss of adhesion to unexposed control sample.	No sample showed detrimental effects or loss of adhesion to unexposed control sample.

Higher Temperature Tests - 115°C - 120°C

Secondary temperature tests were carried out on a label manufactured from Imaging Film and a Base Sheet without any over-lamination. The sample was applied to an aluminium substrate and subjected to temperatures from 115°C to 120°C for 10 hours. At the end of the exposure period, the label was examined visually for damage and the adhesion compared to a control sample left at room temperature

Test		Plastic Label	Aluminium Label
Temperature resistance 10 hours exposure	115°C to 120°C	No sample showed detrimental effects or noticeable loss of adhesion to unexposed control sample	No sample showed detrimental effects or noticeable loss of adhesion to unexposed control sample

Abrasion Resistance

The samples were subject to 750 cycles on the Taber Abraser (ASTM S4060) using CS17 wheels with a load of 1000g. The weight loss in milligrams was determined.

Test	Plastic Label	Aluminium Label
Abrasion Resistance Taber CS17 1000g.	Weight loss: Sample 1 - 30.0mg Sample 2 - 29.8mg After 750 cycles, samples show no loss of legibility, only surface scratching causing loss of gloss.	Weight loss: Sample 1 - 34.6mg Sample 2 - 27.9mg After 750 cycles samples show no loss of legibility, only surface scratching causing loss of gloss.

Humidity

The samples were exposed for a period of 72 hours at 32°C and 95% RH. At the end of the test period they were visually examined and the adhesion tested as in the temperature resistance test.

Test	Plastic Label	Aluminium Label
Humidity 32°C 95% RH 72 hours	No detrimental effect observed. No loss of adhesion relative to unexposed control sample.	No detrimental effect observed. No loss of adhesion relative to unexposed control sample.

Salt Spray

The samples were exposed for a period of 48 hours to neutral salt spray (5% concentration) in accordance with BS 3900:F12 at a temperature of 35°C. At the end of the test period they were visually examined and the adhesion tested.

Test	Plastic Label	Aluminium Label
Salt Spray 5% concentration 35°C 48 hours.	No detrimental effect observed. No loss of adhesion relative to unexposed control sample.	No detrimental effect observed. No loss of adhesion relative to unexposed control sample.

UV Ageing - Processed Labels

Samples were produced, with and without over-laminating film, and exposed in the QUV apparatus operating in accordance with ASTM G53. UVA 340 lamps were used and the exposure weathering cycle consisted of 4 hours condensation at 40°C followed by 4 hours UV at 60°C. Exposure was given to equivalent of approximately 3 years UK natural exposure (45° facing South).

Test	Plastic Label	All Labels
UV Ageing - processed labels	Equivalent approx. 3 years U.K. exposure	Slight colour loss - (darkening of emulsion) on White Imaging Film. No other sample showed any evidence of colour loss on Imaging or Base Film.

Test Notes

- 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.
- 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:
Seller's and manufacturer's 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.