

Technical Bulletin 7.5

Outdoor Durability of Mactac Graphics - Self-adhesive films

INTRODUCTION

At Mactac, we care about the quality of our products during application and throughout time. Most of our products are therefore warranted for several years outdoors and indoors according to applications. However, exposure of the products to UV light and temperature inevitably leads to degradation of the graphics and/or fading of the ink colour over time. The most determining factor for a graphics durability is the geographical location of application, correlated to the overall UV exposure of the graphics. Other parameters greatly influencing the durability of the products are temperatures and humidity of the region, pollution level and altitude, graphic orientation and, in the case of digitally printable graphics, the nature of the inks (solvent, latex, UV) as well as the ink load used.

Horizontal and/or south-facing exposure in high temperatures, in high UV exposed climates are the worst conditions a graphics product will have to withstand.

In the case of digitally printable Mactac Self-Adhesive Films, laminates are recommended to limit the colour fading of the inks, in addition to mechanical protection and ease of cleaning. Mactac laminates provide other functionalities to the printed image - like glossiness, mattness, structured surface, anti-graffiti or anti-slip performance – are also available.

In the table below, Outdoor durability of digitally printable Mactac products (printed media + appropriate laminate), vehicle wrapping films (colours and transparent) and Signage films are reported. These values are only valid if graphics are applied according to Mactac Guidelines and converted using standard CMYK, OEM inkjet digital inks (for digitally printable products).

ZONE DEFINITION

The climate of a region greatly influences the outdoor durability of Mactac self-adhesive products (printed and unprinted).

The globe has therefore been divided into 3 regions or zones:

Zone 1	Zone 2		Zone 3	
Andorra Austria Belarus Belgium Bosnia & Herzegovina Bulgaria Croatia Czech Republic Denmark Estonia Finland France (excluding Corsica) Georgia Germany Hungary Iceland Ireland Italy (North and	Albania Armenia Australia* Azerbaijan Bahamas Bangladesh Barbados Belize Benin Bhutan Bolivia Brazil Burkina Faso Burundi Cambodia Cameroon Cape Verde Caribbean Isles Chile China	Madagascar Malawi Malaysia Maldives Malta Mauritius Micronesia Myanmar (Birma) Nepal New Zealand Nicaragua Panama Papua New Guinea Paraguay Peru Philippines Portugal Puerto Rico Rwanda Samoa	Afghanistan Algeria Angola Australia – <i>Above a line 100km north of Perth/Brisbane</i> Australia – <i>Desert areas</i> Bahrain Botswana Central African Rep. Chad Congo Cyprus Egypt Equatorial Guinea Eritrea Ethiopia	Sierra Leone Somalia South Africa Tanzania Tunisia Uganda United Arab Emirates Yemen Zambia Zimbabwe

Rome) Kosovo Latvia Liechtenstein Lithuania Luxembourg Macedonia F.Y.R. Moldova Monaco Montenegro Netherlands, the Norway Poland Romania Russia San Marino Serbia Slovakia Slovenia Sweden Switzerland Ukraine United Kingdom United States of America* Vatican City *Except desert areas of the States mentioned in Zone 2	Colombia Costa Rica Côte d'Ivoire Dominica Dominican Republic Ecuador East Timor El Salvador Fiji France (Only Corsica) Greece Grenada Guatemala Guyana Haïti Honduras Indonesia Italy (South of Rome) Jamaica Japan Kazakhstan Korea (South) Kyrgyzstan Laos Lesotho	Sao Tome & Principe Singapore Spain Sri Lanka Suriname Swaziland Taiwan Tajikistan Thailand Togo Trinidad & Tobago Turkey Turkmenistan Uruguay Uzbekistan Venezuela Vietnam <i>Arizona</i> <i>California</i> <i>Florida (Southern)</i> <i>Nevada</i> <i>New Mexico</i> <i>Texas</i> <i>Utah</i> * Exceptions classified in Zone 3	Gabon Gambia Ghana Guinée Guinée-Bissau India Iraq Israel Jordan Kenya Kuwait Lebanon Liberia Libya Mali Mauritania Mozambique Namibia Niger Nigeria Mexico Morocco Oman Pakistan Qatar Saudi Arabia Senegal Exposed at all sites above altitudes of 1000 meters
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TABLE OF DIGITAL INKJET PRINTERS AND INKS COMPATIBLE FOR MACTAC DIGITAL FILMS

Mactac provides warranties for Digital products that combine printable films with OEM printers and inks in the table below, to guarantee compatibility and provide superior performance.

More details can be found on our warranty coverage in the individual Product Warranty document which is available upon request.

WARRANTIES FOR DIGITAL INKJET PRINTERS AND INKS		
Brand	Model	Inks
AGFA	Jeti Tauro H3300 LED Anapurna RTR3200i Oberon RTR3300	Anuvia 1551 (UV LED) Anapurna 1501 (UV LED) Oberon 1470 (UV LED) * Where relevant, white inks and spot colour inks are excluded from warranty.
CANON	CS 6407 / 6410 CS 9065 / 9090 CS 9265 / 9290 CS 9050 / 9060 / 9065 / 9090 CS 9160 CS 9350/ CS 9360 Colorado 1650 Colorado 1630 Colorado M-Series	IJC 640 IJC 910 IJC 920 IJC 930 IJC 930 IJC 932 UVgel 460 ink UVgel 460 ink UVgel 460 ink
DURST	Rho 160 / 160+ / 160R Rho 205 Rho 312R / 512R Rho 320R / 320R HS Rho 350R / 351R Rho 500R Rho 600 Rho P10 320R P5 LED Series	Rho Roll Ink Rho Roll Ink Rho Roll Ink Rho Roll Ink Rho Roll Ink Rho Roll Ink Rho Roll Ink Rho Roll Ink Rho Roll Ink Durst Roll LED ink * Where relevant, white inks and spot colour inks are excluded from warranty.
EFI Vutek	UltraVu 150 UltraVu 5300 / 5330 UltraVu II 2360 Vutek 32H	UltraVu 5 Ink UltraVu 5 Ink UltraVu 5 Ink GSLX XP (UV)
EPSON	GS-6000 SC-30600 SC-50600 SC-70600 SC-S40600 series SC-S60600 series SC-S80600/80600L series SC-R5000/R5000L	UltraChrome® GS UltraChrome® GS2 UltraChrome® GS2 UltraChrome® GSX UltraChrome® GS3* UltraChrome® GS3* UltraChrome® GS3* UltraChrome® RS *Durability is based on CMYKLCmLkR inks. Maximum durability for Orange ink is 3 years, zone 1 vertical. There is no expectation of durability for white, metallic and green inks.

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HP	HP Latex 3000 Series HP Latex 300 Series HP Latex 1500 HP Latex 560/570 HP Latex R1000/2000 HP Latex 700/700W HP Latex 800/800W HP Latex L2700 Series HP Latex 630/630W	HP 881/891 Latex Ink HP 831/871 Latex Ink HP 881 Latex Ink HP 831/871 Latex Ink HP 882 Latex Ink* HP 832/ 832Y Latex Ink* HP 873/ 873Y Latex Ink* HP 883 Latex Ink* HP 832 Latex Ink* *With Gen 4 Latex, HP has removed the anti-scratch agent from the pigmented inks and replaced it with a new component called 'Overcoat'. In order for qualified HP Latex printers and Inks to be covered by the listed warranties, where overlamine protection is needed, all prints must be done without the use of 'overcoat'. To ensure 'overcoat' is not used, two options are available to proceed: a) modify the overcoat setting at 0 dpp from the substrate media presets, or b) check the option "Optimize for lamination" in the RIP's printer settings. Failure to do so will void any warranties stated within this document.
MIMAKI	JV5 Series JV33/150/300 Series JV34-260 JV400 LX JV400 SUV JFX200/600 JFX500 CJV30/150/300 Series UJV160 UJV500-160 UCJV150/300 Series SWJ320 Series JV100 Series UJV100 Series CJV330 / JV330 Series	HS / ES3 (Solvent) SS21 / ES3 / BS3 / BS4 (Solvent) SS21 (Solvent) LX101 (latex) SU100 (Solvent / UV) LH100 / LH120 / LUS150 (UV-LED) LUS150 (UV-LED) SS21 / BS4 (Solvent) LF-200 (UV) LUS150 / LUS200 (UV) LUS170 (UV) CS100 / CS200 (Solvent) SS21 / AS5 / BS4 (Solvent) LUS170/LUS190/LUS210 (UV) SS21 / BS4 (Solvent) * Where relevant, white, orange and silver metallic inks are excluded from warranty unless stated otherwise.
MUTOH	ValueJet VJ-628 ValueJet VJ-1324X ValueJet VJ-1604X ValueJet VJ-1624X ValueJet VJ-1638X ValueJet VJ-2638X all XpertJet SR models all ValueJet models and XPJ-1341SR-P all XpertJet SR and XpertJet 16xx SR-P models all XpertJet SR-P models ValueJet VJ-1638UR / UH	Eco Ultra Eco Ultra / UMS ink Eco Ultra / UMS ink Eco Ultra / UMS ink Eco Ultra / UMS ink Eco Ultra / UMS ink UMS / MS41 ink MS31 ink MS41 ink MS41 ink UMS21 / MS51 ink UA31 ink * Where relevant, white inks are excluded from warranty.
OKI	ColorPainter V-64s ColorPainter H-74s / H-104s ColorPainter H2-74s / H2-104s ColorPainter W-54s / W-64s ColorPainter M-64s ColorPainter H3-104s ColorPainter E-64s	EG-Outdoor LX EG-Outdoor GX EG-Outdoor GX EG-Outdoor GX SX Inks SX Inks SX Inks
ROLAND	VersaCamm SPi/VP Series VersaCamm VS Series SolJet Pro II Series SolJet Pro III Series SolJet Pro IV XR/XF Series VersaART RS/RE Series VersaSTUDIO VersaCamm VS-i Series	Eco-Sol MAX I/III Eco-Sol MAX I/III Eco-Sol MAX I/III Eco-Sol MAX I/III Eco-Sol MAX II/III Eco-Sol MAX I/III Eco-Sol MAX I/III Eco-Sol MAX II/III

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	VersaEXPRESS RF SolJet EJ-640 TrueVIS VG/SG Series TrueVIS VG/SG 2 Series TrueVIS VF2-640 TrueVIS LG/MG Series TrueVIS AP-640	Eco-Sol MAX II/III EJ ink TR2 ink TR2 ink TR2 ink EUV5 ink (UV) TrueVIS Resin ink * Unless otherwise stated, durability for white, metallic, orange or green inks are not covered.
SWISSQPRINT	Karibu	FR1 * Unless otherwise stated, durability for white, metallic, orange or green inks are not covered.

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TABLE OF OUTDOOR DURABILITY FOR MACTAC GRAPHICS - SELF-ADHESIVE FILMS

This table is not exhaustive: please contact us for more information.

More details can be found on our warranty coverage in the individual Product Warranty document which is available upon request.

OUTDOOR DURABILITY TABLE FOR MACTAC DIGITAL FILMS AND LAMINATES PER REGION									
Print media name	Laminate name	Vertical exposure				Horizontal exposure			
		Unit	Zone 1	Zone 2	Zone 3	Unit	Zone 1	Zone 2	Zone 3
JT 8500 Series	LF 8500 Series	Years	2	1	-	Years	1	0.5	-
JT 8510 WM-PG PP	LUV 7036	Years	2	1	0.5	Years	1	0.5	-
JT 8510 WM-PG PP	LF 8510 CS PP	Years	2	1	0.5	Years	1	0.5	-
Easy 209P Series	LF 8700 Series	Years	1	0.5	-	Years	0.5	-	-
JT 8700 Series	PG 7034	Years indoor	2	2	2	Years indoor	1	1	1
JT 8700 Series	LF 8700 UV Series	Years	3	2	1.5	Years	1.5	1	0.5
JT 8700 Series	LUV 7036 / PG 7075	Years	3	2	1	Years	1.5	1	0.5
JT 9300 Series	LF 9300 UV Series	Years	3	2	1	Years	1.5	1	0.5
JT 9500 Series	LAG 100	Years	3	2	1.5	Years	1.5	1	0.5
JT 9500 Series	LF 9500 UV Series	Years	4	2.5	1.5	Years	1.5	1	0.5
JT 9500 Series	Permafun Coarse Wood, Brushed Metal	Years	5	3.5	2.5	Years	2	1.5	1
JT 9700 Series	LAG 100	Years	3	2	1	Years	1.5	1	0.5
JT 9700 Series	LF 9700 UV Series	Years	5	3.5	2.5	Years	2	1.5	1
JT 9700 Series	Permafun Coarse Wood, Brushed Metal	Years	5	3.5	2.5	Years	2	1.5	1
WW 100 PRO	LF 10500 CG / LAG 100	Years	3	2	1.5	Years	1.5	1	0.5
WW 100 PRO	LF 10700 UV Series	Years	3	2	1.5	Years	1.5	1	0.5
WW 300 Series	LUV 7036 / PG 7285	Years	2	1	0.5	Years	1	0.5	-
WW 300 Series	LF 8700 UV Series / LAG 100	Years	3	2	1.5	Years	1.5	1	0.5
WW 300 PVC-free Series	LUV 7036 / PG 7075	Years	2	1	0.5	Years	1	0.5	-
WW 300 PVC-free Series	LF 8510 CS PP	Years	5	3	1.5	Years	2.5	1.5	0.5
WW 300 PVC-free Series	Permacolor HORIZON™	Years	7	5	3	Years	3.5	2.5	1.5
Vehicle Wrapping									
JT 10500 WG-BFG	LF 10500 CG	Years	4	2	1	Years	1.5	-	-
JT 10700 Series	LF 10700 UV Series	Years	5	3	1.5	Years	2.5	1.5	0.5
JT 10800 WG-BFG	LF 10700 UV Series	Years	5	3	1.5	Years	2.5	1.5	0.5

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Floor Graphics		Horizontal exposure indoor				Horizontal exposure outdoor			
JT 8700 Series	LUV 6300 LUV 6301	Months indoor	6 3	6 3	6 3	Months outdoor	- -	- -	- -
WW 300 Series	FloorGrip	Months indoor	12	12	12	Months outdoor	3	1.5	-
StreetRap	StreetLam FloorGrip	Months indoor	- 3	- 3	- 3	Months outdoor	6 3	3 1.5	1.5 -
Window Graphics									
JT 7301 WG-PB 40 / JT 7302 WG-PB 30	LUV 7036	Years	2	1	0.5	-	-	-	-
JT 7501 WG-PB 40	LF 10500 CG / LUV 7036	Years	3	2	1	-	-	-	-
JT 6710 CG-RT	LUV 7036 / PG 7075	Years	2	1	0.5	-	-	-	-

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OUTDOOR DURABILITY TABLE FOR MACTAC VEHICLE WRAPPING FILMS

Series Name	Type	Vertical exposure				Horizontal exposure			
		Unit	Zone 1	Zone 2	Zone 3	Unit	Zone 1	Zone 2	Zone 3
Vehicle Wrapping									
Mactac ColourWrap Series	White/Black Colours Metallics	Years	8 6 4	5 4 3	3 2 1.5	Years	5 3 2	3 2.5 1.5	1.5 1 0.5
Mactac TF700 BF Sublime	White/Black Colours Metallics	Years	8 6 4	5 4 2	3 2 1	Years	4 3 2	3 2 1	0.5 0.5 0.5
Mactac TF Carbon BF	Black	Years	5	4	2.5	Years	3	2	-
Mactac ColorSkin 9900	White/Black Colours Metallics	Years	6 4 2	3 2 1	- - -	Years	3 2 1	1.5 1 0.5	- - -
Mactac Protect Pro	Transparent	Years	10	8	6	Years	7	4	3

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OUTDOOR DURABILITY TABLE FOR MACTAC SIGNAGE FILMS PER REGION

Series Name	Type	Vertical exposure				Horizontal exposure			
		Unit	Zone 1	Zone 2	Zone 3	Unit	Zone 1	Zone 2	Zone 3
Opaque									
MACal 8000	-	Months	3.0	1.0	0.5	-	-	-	-
MACal 8200	Black&White Colours	Years	4.0 3.0	2.0 1.0	1.0 0.5	-	-	-	-
MACal 8300	Black&White Colours	Years	5.0 4.0	3.0 2.0	1.5 1.0	-	-	-	-
MACal 8900	Black&White Colours	Years	4.0 3.0	2.0 2.0	1.0 1.0	-	-	-	-
MaCal 9300 PRO	Black&White Colours Metallics	Years	8.0 7.0 5.0	6.0 5.0 3.0	4.0 3.0 1.0	-	-	-	-
MACal 9800 (PRO, Cast, HT)	Black&White Colours Metallics	Years	10.0 8.0 5.0	8.0 6.0 3.0	6.0 4.0 1.0	-	-	-	-
MACal Truck Tarp	White	Years	5.0	3.0	1.0				
Translucent									
MACal 9722 light PRO	-	Years	7.0	5.0	3.0	-	-	-	-
MACal 9700	Black&White Colours	Years	7.0 5.0	5.0 3.0	3.0 1.0	-	-	-	-
Windows Films									
MACcrystal 8400	-	Years	3.0	1.0	0.5	-	-	-	-
Glass Decor 500	-	Years	5.0	3.0	1.0	-	-	-	-
Glass Decor 700	-	Years	5.0	3.0	1.0	-	-	-	-
Reflective									
MAClite 4700	White	Years	3.0	1.0	0.5	-	-	-	-
MAClite 5700	Black&White Colours	Years	7.0 5.0	5.0 3.0	3.0 1.0	-	-	-	-
Metallized Films									
MACal 1079-02	-	Years	2	1.0	-	-	-	-	-
MACal 1069-02	-	Years	1	-	-	-	-	-	-
Specialities									
WallCHALKER	-	Years	4.0	2.0	1.0	-	-	-	-

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