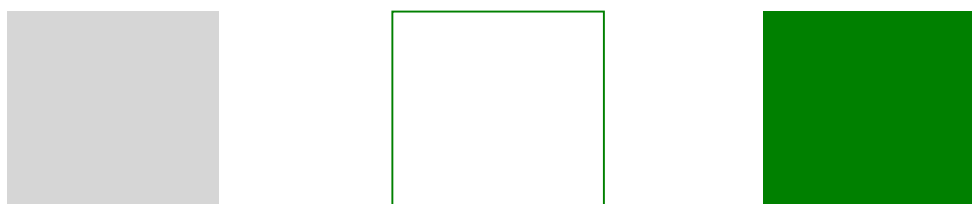


Xerox Wide Format Applications Guide

SX2 Oil Piezo Inkjet





Wide Format Oil Inkjet

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This guide is intended to provide users of Xerox oil inkjet media and Xerox or Seiko oil inkjet printer solutions with information about media performance and application suitability, and generally to help with selection of wide format media to ensure that customers expectations are reliably met. This guide is a compilation of applications for digital prints created on the X2 inkjet printers, mostly aimed at the print for pay and graphic arts market, although a section also addresses the needs of GIS and CAD applications.

The procedures in this guide are general and assume that you are already familiar with the X2 user guide and general printer / RIP software functions.

Individual media data pages give product specific details and production tips. The Applications Ideas & Procedures section gives instructions and tips specific to a range of common applications. An overview of lamination techniques is also included.

The Xerox oil inkjet media range is formulated for use on Xerox and non-Xerox printing equipment alike, but is specific to oil piezo. These media are not suitable for either aqueous or solvent inkjet.

www.xerox.com/iccprofiles.

Oil inkjet is the smallest sector of the inkjet market and provides a means of printing for both high-quality, close-viewed photo-realistic graphics as well as high production volumes. Oil-based inks give outdoor durability and colour-fast imaging approaching that of solvent printing systems but without the environmental issues often associated with solvents. Piezo technology and fast-drying oil inks in the X2 enable print speeds of up to 55 square metres per hour which often makes X2 printing the preferred option for high volume graphics print production, for such as billboard sets.

Oil inkjet printing requires all media to be coated with an ink receiver with specific properties to hold oil ink in place and allow it to dry properly. Aqueous and solvent media are rarely suitable for oil and some can prove spectacularly unsuitable. The properties of oil ink receiver coatings do cause limitations in terms of the print applications: Clear film and glossy media are not possible for oil printing. Xerox oil inkjet media is formulated specifically for this technology and designed to extend the capabilities of oil inkjet printing as widely as possible across the range of possible applications.

All Xerox Inkjet media are tested and supported for the printing applications described and are backed by the usual Xerox guarantees. Xerox identifies the media recommended for oil inkjet printing with a green coloured band on the product label. These media should **not** be confused with inkjet media for aqueous or solvent systems as properties and compatibilities are specific.

Further information on Xerox oil inkjet media, as well as other ranges for aqueous and solvent inkjet printing is available through your usual Xerox supplies contact or via the same enquiries facility on the Xerox website.



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Choosing Appropriate Materials

Xerox Oil Inkjet Media all vary in coating structure, physical properties (such as base weight and thickness), and base material type (paper, fabric, films or vinyl). These variances not only need a specific printer set-up to successfully run each material through the printer, but will cause some differences in achievable image quality per media type, eg. Fabrics give different image quality to vinyl even if both are printed in the same resolution.

The coating layer or layers on each media type differ because the structure must take account of base properties (i.e. thickness, absorbency, smoothness, texture), must provide suitable adhesion to both printed image (ink) and the base material, and the base-coating combination must meet the needs of the application. Each media is also specified to print within a range of resolutions.

The most common mistake in constructing a graphic is using incorrect materials. The choice of materials requires critical information about the end-use. Ask the following questions to determine the application requirements and use the information in this guide to select the materials that will work best.

1. How will the print be viewed?

What is the viewing distance – close-up in an exhibition hall, hanging 10 stories up on the side of a building, or on the side of a moving vehicle?

2. What are the environmental conditions where the print will be displayed?

Indoors or outdoors? Is there a harsh element such as pollution, water, wind or direct exposure to sunlight? Are there extreme weather patterns and fluctuations?

3. What is the expected life or durability of the print?

How long will it be displayed? How many times will it be used, stored, or posted?

4. What types of finishing or rigid materials for mounting are needed?

Will it be finished with a laminate or encapsulated? Is a glossy surface best or would glare hinder viewing? Does the print need to be made into a banner with seams and eyelets?

5. What is the budget for the job?

Appropriate Applications for Media

Use the following matrix to quickly determine if a media type may be suitable for an application

	Poster	Mounted Print	Proofs	Check-Plots	Backlit Display	Bill Board	Multi-panel Display	Banner	Wall Graphics	GIS / CAD
80 g/m ² Line Art Paper				✓						✓
90 g/m ² Coated Graphic Design Paper			✓	✓						✓
95 g/m ² Hi White Graphic Arts Paper	✓	✓	✓	✓						✓
125 g/m ² Hi White Graphic Arts Paper	✓	✓	✓				✓		✓	
120 g/m ² Outdoor Poster Paper - Blue Backed	✓	✓			✓	✓	✓		✓	
125 g/m ² Presentation Paper, 720 dpi	✓	✓	✓		✓		✓			✓
115 g/m ² Presentation Paper	✓	✓	✓				✓		✓	
160 g/m ² Heavy Weight Presentation Paper	✓	✓					✓			✓
236 g/m ² Reinforced Paper	✓						✓	✓		
White Matt Film	✓				✓					
Backlit Film					✓					
Banner Fabric								✓		
Banner Vinyl								✓		
Pressure Sensitive Vinyl		✓					✓		✓	

The solutions presented here have been taken from actual work carried out using X2. Each has been tested in the field and proven successful for the specified use. While there is no such thing as a typical job, these methods cover the majority of the applications currently suited to oil inkjet and the X2 printer and are fully supported by Xerox. Each media data sheet gives a more detailed description of specific media capabilities.

Durability of Graphics

Durability is a function of both ink and media.

Oil-based pigmented inks for X2, Xpress and other oil printers offer properties that differ considerably in terms of UV stability / light-fastness and general resistance to degradation. All are generally suitable for use outdoors, with or without lamination. Over-laminates and encapsulation will extend the life of most images, protecting against moisture, mechanical handling, abrasion or UV.

Often a graphic has a life requirement of a few weeks, but signage applications can require the print to survive without deterioration for several years. The conditions of the environment in which a graphic is to be displayed should also be taken into consideration.

Ink and media are both critical factors in the life expectancy of oil inkjet prints. The properties of the media must support the ink capabilities and must match the needs of the application as part of the total graphics construction. This guide describes the capabilities for each Xerox oil media printed with X2 inks.

Tests are carried out to simulate different environments. For INDOOR applications, the expected life is measured under moderate conditions assuming the graphic will be displayed in a normal office environment with limited exposure to sunlight. The moderate OUTDOOR environment refers to a climate with mild temperature ranges (4-27°C), low humidity (10-50%RH) and minimal ambient UV and pollution exposure. Different environmental factors may affect the application durability. Abuse, wind and moisture will have cumulative effects on reducing the print life. **Any testing and support for conditions outside these parameters is the responsibility of the print provider.**

The following table gives a quick reference indication of expected life of imaged media indoors and outdoors.

PRODUCT	LAMINATED (indoor / outdoor)	UN LAMINATED (indoor / outdoor)	COMMENTS
80g/m ² Line Art paper	No data	No data	For indoor use only
95g/m ² High White paper	5 years / 18 months	6 months / 2 days	To protect from moisture / abrasion laminate with at least a 75 mic thermal laminate
125g/m ² High White paper	5 years / 18 months	6 months / 2 days	To protect from moisture / abrasion laminate with at least a 75 mic thermal laminate
115g/m ² Presentation Paper	10 years / 2 years	3 months / not rec.	To protect from moisture / abrasion laminate with at least a 75 mic thermal laminate
120g/m ² Blue Back Paper	Not recommended	1 year / 6 months	No over-laminate required for outdoor pasting
120g/m ² Short Term Blue Back Paper	Not recommended	4 months	No over-laminate required for outdoor pasting
125g/m ² Presentation paper - 720dpi	15 years / 3 years	Not recommended.	Laminate with at least a 75 mic thermal laminate
160g/m ² Presentation Paper	5 years / 2 years	1 year / 3 months	If protection from moisture / abrasion is required laminate with at least a 75 mic thermal laminate
236g/m ² Reinforced Paper	10 years / 2 years	1 year / 2 days	Can use thermal or pressure sensitive laminates
150 micron White Matt film	2 years / 18 mnths	1 year / 7 months	Water resistant without over-lamination.
175 micron Backlit Film	2 years / 1 year	Not recommended	Laminated with at least a 75 mic thermal laminate, assumes installation in a suitable lightbox
Pressure Sensitive Vinyl	5 years / 2 years	1 year / 6 months	Use pressure sensitive over-laminates.
160g/m ² Banner Fabric	Not Required	2 years / 1 year	Laminating will not extend UV life indoors or out.
250g/m ² Fire Retardant Banner Fabric	Not applicable	2 years / 1 year	Certified M2 and B1 fire retardant
400g/m ² Banner Vinyl	Not Required	2 years / 1 year	No over-laminate required unless subject to moisture or abrasion. Laminate will not extend UV life indoors or outdoors.

Expected image life varies for each media type, and according to the type of over-laminate used. The table above lists durability expectations of each media when laminated with a 75 micron thermal laminate on both sides of the print (encapsulated with a 4mm sealed edge for outdoor use) unless otherwise specified.

Waterfastness

The term "waterfast" or "water resistant" should not be interpreted to mean "water proof", i.e. a printed image may be submerged under water, or be held under a running tap without destroying the printed image.

Definition of Waterfast/Water Resistant - these two terms are used interchangeably. It is the ability of a printed image to withstand the effects of water with minimal or acceptable change.

Clarification: Effects of water refers to brief contact with water, such as the result of spilling a glass of water and immediately blot-drying with a clean, lint-free cloth. It does not include exposure to any other liquid (such as coffee, tea, alcoholic beverages, milk, seawater, etc.). Minimal or acceptable change refers to the amount of ink migration ("running") that occurs when a printed image is exposed to water. Minimal is slight ink migration from any area of the image, and acceptable would mean no visible ink migration.

Many media are waterfast or water resistant- including white matt film, pressure sensitive vinyls, banner fabric and banner vinyl. Details on their durability can be found on the media fact sheets or the durability guide.

However most water resistant media are not waterproof and CANNOT be submerged in water or subjected to running water. Outdoor blue back paper is waterproof when used in its normal billboard application process. See media fact sheet for details. Finishing guidelines for out door durability e.g. lamination must be followed when constructing a print for out door use.

Printer Compatibility

All Xerox oil inkjet media are formulated for Xerox X2 equipment but they can also be used in Xpress and Seiko equipment with some differences in output performance. Appropriate print testing should be carried out before commencing any large-scale production to ensure expectations are fully met. Durability guidelines listed apply for X2 printed images.

Use of Non-approved Supplies

Xerox authorised inks, media or other supplies are designed and tested to assure optimum performance from the X2 printer. Non-approved materials may not produce the same quality product and may cause service problems or damage to the unit. Such damage will void the warranty and may result in additional service cost.

The X2 printer is sensitive to unique core tolerances, as well as, media curl, which will cause the printer to jam excessively. Unacceptable core tolerances will cause media slippage and image mis-registration.

Non-Xerox media may not fully be tested in the "corner-to-corner" environmental range, therefore is not assured to work successfully in the X2. For example, media that is not capable of performing in the high (or low) end of the humidity and temperature range may cause material "cockle" or head strikes. Although some media will produce an acceptable level of image quality for some regions, sometimes, the overall quality and material coating consistency cannot be assured or backed by Xerox.

IMPORTANT NOTE: The use of non-qualified supplies in the Xerox X2 could damage the printer. Such damage will void the warranty and may incur additional service costs chargeable to the user. They include:

Head Strike which is defined as any contact between the nozzle surface of the writing heads and the media in the paper path. Head strikes may cause no ill effect to the writing, however it should be taken as a warning that a Head Crash is about to occur.

Head Crashes occur when the print heads catch the edge of the media as it begins to traverse the print area. This is extremely damaging to the print heads and very expensive to repair. Media that is too thick or curls at the edge can cause head crashes.

If the cause of this damage is due to use of unapproved media, the customer will be charged for parts and labour for repairs. The labour process requires the damaged head to be replaced and the machine recalibrated, resulting in extensive chargeable service and production "down time".

ICC Profiles & Settings

Although certain generic settings can enable good colour reproduction, the correct printer firmware and software settings should be used. Overall ink limit, individual ink restrictions and linearisation should be adjusted and set specifically per printer, ink, RIP software and media used. Limiting and calibrating the amount of ink used optimises both image quality and drying time, and consequently accelerates the production process. A specifically created ICC profile should also be used whenever possible to optimise image quality and production of colour. A selection of settings and profiles is available from www.xerox.com/iccprofiles or via your usual Xerox supplies sales contact.

Image Quality

The following tips may help you to understand the image quality you should expect from using Xerox media in your printer, as well as offering hints for ensuring output quality meets application needs:

- **LOAD** the media properly. It may help to run thicker media in the rear roll position.
- **EXPECTATIONS:** Image quality varies from one media to another. Each media is designed for a set of application needs. Selecting the right media ensures that image quality expectations are met.
- **ENVIRONMENT:** Viewing distance and display environment must be considered when determining if output quality is acceptable, e.g. viewing distance of 5m may allow a degree of image imperfection.
- **CONSIDER ALTERNATIVES:** More than one media type may suit any given application. Ease-of-use, image quality, and display site all have a bearing on selection. Experiment with alternatives.
- **PRINTER SPEED** Due to specific media characteristics, different print modes or printing speeds are used. For projects requiring duplicate images in significant quantities, run test images in various modes to determine the most appropriate speed for your application needs. X2 is designed to provide sellable output at high speed.
- **PANTONE® COLOURS** Colour reproduction is a function of the RIP or software connected to the printer. Xerox provides profiles and settings specific to media, RIP, ink and printer. These profiles are balanced to perform in a wide range of colour applications. Most RIPs also allow the user to update, adjust or create colour profiles to meet specific colour requirements. Profiles can be downloaded from www.xerox.com/iccprofiles for Xerox X2 and both Onyx and Caldera software.
- **COCKLE** Exceeding the media ink limits can cause cockle. This is undesirable not only in the finished print but also because it may result in head strikes. A head strike occurs when the print head rubs a raised point on the media surface. All Xerox inkjet media is tested to ensure that recommended settings and profiles will not risk a problem with head strike and will have acceptable finished quality when dried.
- **BANDING** A certain level of banding may be visible in inkjet print output. This is inherent to inkjet printing technology. Some possible actions to address banding (not to be confused with gradient segmentation):
 - a) **Increase Passes** - Banding becomes obscured as the number of passes is increased.
 - b) **Set Printing Direction** - Unidirectional printing generally gives less banding than bidirectional.
 - c) **Adjust Carriage Speed** - Some printers give the operator the ability to slow the carriage speed.
 - d) **Convert Black** - Convert single colour black areas to 4 colours (CMYK) in the application software.
 - e) **Rotate** - Try rotating the image to reduce the appearance of banding.
- **GHOSTING** is when the appearance of one image offsets onto subsequent images when printing large blocks of negative text (blank text inside a colour). This is a feature of oil inkjet systems, not a failure of any one individual item, i.e. ink or media. The reason for this phenomenon is a difference in the amount of oil in two areas of the same density. Although the inks are instantly dry to the touch, it takes some time for the oil in the inks to completely disperse and stabilise in the media coating. If left exposed to the air this effect will disappear over time. Several workarounds are possible, depending on the workflow and application. Please see the suggestions listed in the Application Ideas & Procedures section for Paper Applications in this guide to determine which method suits you.

Fire Resistance & Flame Retardant Properties

Media for exhibition and display graphics are sometimes required to meet flammability ratings. The main standards used are the "M" and the "B" ratings (B1 often considered similar but not higher than M1) and the US NFPA standards. There is no common international standard at the time of writing.

M1

A material is classified M1 if the tests with the electrical burner (NF P 92-503) results in:

- No inflammation remaining longer than 5 seconds after removing the flame
- No points of ignition with flame propagation higher than 25 cm above the lower edge of the probe
- No drops of flaming material (test for thermo fusible materials NF P 92-505 to be passed)

If the material pierces without inflammation or with inflammation which subsides within 5 seconds, the persistency test (NF P 92-504) results in ***no flame persistency at all and no burning material drops.***

M2

A material is classified M2 if it does not fall into category M1 because

- Inflammation persists longer than 5 seconds after removing of the flame
- Destruction of the material deeper than 35 cm from the lower edge of the probe is observed
- No drops of flaming material (test for thermo fusible materials NF P 92-505 to be passed)

If the material pierces without inflammation or with inflammation which subsides within 5 seconds, the persistency test NF P 92-504 results in ***flame persisting for no longer than 5 seconds without propagation and no burning material drops.***

ASTM e84 measures the burning behaviour of a material when exposed to heat and fire by observing the flame spread across the specimen when exposed to an ignition source face down.

NFPA 701 establishes two test procedures to assess the propagation of flame beyond the area exposed to an ignition source for textiles and films. The tests are appropriate for testing materials that are used as draperies, curtains or other window treatments, awnings, tents, traps and plastic films used for decorative or other purposes.

Supplies Storage & Handling

- Ink and media are sensitive to environmental conditions. It is important that supplies are kept in a controlled area for the best image quality and operations when used in the printer.
- **For Standard Inks and Media:**
Printing: 18-30 °C non-condensing 30-70% Relative Humidity.
Storage: 5-35 ° 40-60% Relative Humidity
Important: Inks can be permanently damaged if exposed to temperatures outside of this range for any period of time.
- If media are kept in an environment outside of these parameters, they may still be used to print perfectly, but media should be allowed to normalise in the correct conditions for sufficient time, at least 48 hours prior to use.
- Always store inkjet media products in their original cartons and also in the original wrapper or bag. The full packaging is designed to give the best protection to base materials and ink receiver coatings to maximise product life.
- In case media rolls are separated from their cartons, every roll of Xerox media can be precisely identified from information printed on the inside of the core.
- Most media where sensitised with an ink receiving coating or with other treatments such as adhesive will have a finite shelf life. Nominally the shelf life expectancy is as described below if kept in original, unopened packaging, but this largely depends on precise storage conditions.
 - Media: 2 years
 - Vinyl: 1 year
 - Inks: 2 years
- The image surface must be kept dry and free of grease, oil, silicones and dirt to achieve best results. It is recommended that cotton gloves be used when handling inkjet-coated materials to avoid fingerprints.
- Inks can be permanently damaged if exposed to temperatures outside their range for any period of time.

This guide is not as an instruction manual, it is provided as a source of information and advice, based on practical test experience, and knowledge. While care has been taken to anticipate problems and outline possible difficulties, it is impossible to cover all situations and the content and procedures described do not constitute a warranty. It is highly recommended that you test any application before a job is attempted. The variety of possible applications makes it necessary for users to take specific steps to ascertain the suitability of materials described here for their specific purposes.

For further information contact:

XEROX[®]

Xerox Document Supplies

**Xerox House
Maylands Avenue
Hemel Hempstead
Hertfordshire
HP7 2DE
United Kingdom**

Tel +44 (0) 1442 886 019

www.xerox.com/iccprofiles.com

X2 Inks

X2 graphics inks are pigmented, oil-based, and designed specifically for use with X2 printers and media. These inks are formulated to be smudge resistant, instant drying and can be laminated immediately in most cases. The colour gamut is based on the SWOP (Standard Web Offset Printing) standards for press-quality, colour graphics, versatility and easy colour calibration. The inks do not require any special drying time after printing.

6-colour printing adds two tonal inks, Light Cyan and Light Magenta, to the typical suite of 4-colour process printing (Cyan, Magenta, Yellow, and Black). These colours improve the gradient perception between dithered process colour shifts, or “smoothes out” blended areas of an image by introducing lighter tones of the colours that construct the blend. For example, skin tones appear more true because the colour of dots creating the image on paper are not as dark from one percentage to the next.

Standard Graphic Arts Inks

Part Number	Description	Size
026R00711	Graphic Arts Black	500ml
026R00712	Graphic Arts Cyan	500ml
026R00713	Graphic Arts Magenta	500ml
026R00714	Graphic Arts Yellow	500ml
026R00715	Graphic Arts Light Cyan,	500ml
026R00716	Graphic Arts Light Magenta	500ml

Graphic Arts Plus Inks

Part Number	Description	Size
TBA	Graphic Arts Plus Black	750ml
TBA	Graphic Arts Plus Cyan	750ml
TBA	Graphic Arts Plus Magenta	750ml
TBA	Graphic Arts Plus Yellow	750ml
TBA	Graphic Arts Plus Light Cyan,	750ml
TBA	Graphic Arts Plus Light Magenta	750ml

Production Inks

Part Number	Description	Size
026R00711	Production Black	500ml
026R00712	Production Cyan	500ml
026R00713	Production Magenta	500ml
026R00714	Production Yellow	500ml
026R00715	Production Light Cyan,	500ml
026R00716	Production Light Magenta	500ml

Critical Operating Instructions

- X2 inks are instantly dry to the touch when printed. All X2 prints can be laminated immediately. Please check the individual product specification sheet for details on handling and lamination functions.
- Ink yields are ultimately determined by the image being printed. For example, heavy saturated images will consume more ink at different ratios than light coverage graphics. The following statement provides a general assumption to help in determining approximate ink consumption and costs:
- Printing with 75% ink coverage in 360 dpi print mode, one set of inks (3 litres, C,M,Y,K, LC,LM) will yield 469 sq. metres or 5048 sq.ft. The yields are significantly reduced if printing in 720-dpi mode continuously.
- A small amount of ink is left in the bottom of each ink cartridge. There is extra ink in each of the bottles to compensate for this residue. **Do not attempt to pour residue from one bottle into another bottle.**

Xerox Oil Inkjet Media Range Overview

The scope of this range is generally from 24" (61cm) to 54" (137cm). Demand for some media types and sizes varies according to the applications those media types serve. 36", 42" and 54" roll widths are standard. Development in inkjet media and coatings is continuous and the range of media available constantly changes to meet the needs of the market. New media types are regularly introduced and this guide may not include the full selection available. Whilst Xerox makes every effort to provide and maintain consistent products, media specifications are subject to change without notice. For specific enquiries or queries please contact Xerox via the enquiries section in www.xerox.com/iccprofiles or contact your Xerox Wide Format representative.

		Width		Length	Code	Data Sheet
80 g/m ²	Line Art Paper	54"	1370 mm	91 m	023R01365	1
		36"	914 mm	122 m	023R01366	
		A0	841 mm		023R01394	
		A1	594 mm		023R01396	
90 g/m ²	Coated Design Paper	A0	841 mm	100 m	023R01443	2
		A1	594 mm		023R01444	
95 g/m ²	Hi White Graphic Arts Paper	54"	1370 mm	100 m	023R01424	3
		50"	1270 mm		023R01423	
		42"	1067 mm		023R01422	
		36"	914 mm		023R01425	
125 g/m ²	Hi White Graphic Arts Paper	54"	1370 mm	76 m	023R02064	4
		42"	1067 mm		023R02066	
		36"	914 mm		023R02067	
115 g/m ²	Presentation Paper	54"	1370 mm	76 m	023R01627	5
		50"	1270 mm		023R01628	
		42"	1066 mm		023R01629	
		36"	914 mm		023R01630	
125 g/m ²	Presentation Paper - 720 dpi	54"	1370 mm	45.7 m	023R01263	6
		50"	1270 mm	65 m	023R01264	
		42"	1066 mm		023R01265	
		36"	914 mm		023R01181	
160 g/m ²	Heavy Weight Presentation Paper	54"	1370 mm	61 m	023R01437	7
		50"	1270 mm		023R01438	
		42"	1066 mm		023R01439	
		36"	914 mm		023R01440	
120 g/m ²	Outdoor Poster Paper - Blue Backed	54"	1370 mm	76 m	023R01420	8
		50"	1270 mm		023R01429	
		42"	1067 mm		023R01614	
		36"	914 mm		023R01421	
120 g/m ²	Short-Term Poster Paper - Blue Backed	54"	1370 mm	80 m	023R02180	9
		50"	1270 mm		023R02181	
		42"	1067 mm		023R02182	
		36"	914 mm		023R02183	
236 g/m ²	Reinforced Paper	54"	1370 mm	23 m	023R01296	10
		36"	914 mm		023R01293	
150 mic	White Matt Film	54"	1370 mm	30 m	023R01451	11
		42"	1066 mm		023R01455	
		36"	914 mm		023R01453	
175 mic	Backlit Film	54"	1370 mm	30 m	023R02430	12
		42"	1067 mm		023R02429	
		36"	914 mm		023R02428	
140 mic	Pressure Sensitive Vinyl	54"	1370 mm	20 m	023R02405	13
		42"	1067 mm		023R02404	
		36"	914 mm		023R02403	
400 g/m ²	Banner Vinyl	54"	1370 mm	25 m	023R01418	14
		36"	914 mm		023R01419	
160 g/m ²	Banner Fabric	54"	1370 mm	25 m	023R01415	15
		42"	1067 mm		023R01414	
		36"	914 mm		023R01416	
250 g/m ²	Banner Fabric - Fire Retardant	54"	1370 mm	25 m	023R02002	16
		42"	1067 mm		023R02004	
		36"	914 mm		023R02005	

Description

An economical, basic 80 g/m² medium grade, bright white paper with a smooth matt surface, for use in 360 dpi print mode, but specifically intended for line drawing applications, it meets the line width specifications for GIS/CAD Engineering applications. Not recommended for printing full graphic images.

Line Art Paper can be over-laminated with most commonly available thermal and pressure laminates for added durability.

Applications

Line art, CAD / GIS and engineering drawings, checkplots, charts, graphs, diagrams and similar images with low levels of ink and area coverage.

Physical Characteristics

Base Weight	80 g/m ²
Calliper	113 microns
Opacity	95%
Brightness	115

Dimensions

Code	Width	Length
023R01365	54"	1372mm
023R01366	36"	914mm
023R01394	A0	841mm
023R01396	A1	594mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Recommended for indoor use only.
- Use for line drawing and small areas of low saturation covering.
- Laminate with either pressure or thermal laminates if prints are to be exposed to severe conditions, or if longer durability is required.
- For best results store and use within temperatures of 10-30°C and relative humidity of 40-65%. Store the product in its original carton and bag / wrapper.
- Keep the image surface dry and free of grease, oil, silicones and dirt.
- Ensure that roll ends are protected and that the edge of these media are not damaged. If the media edges are not flat this can result in damage to the printer.

Description

A 90 g/m² medium grade, bright white paper with an ink receiver coating which meets the line width specifications for GIS/CAD and Engineering applications, is ideal for detailed mapping and colour presentation and will provide good graphic image quality. Available in the full range of ISO sizes from A0 to A4.

Applications

Good for all high quality technical drawings including highly detailed images and presentation grade prints, as well as mapping, signage, corporate graphics and charts, promotional displays, full graphic posters. Can be used unfinished or laminated for extra durability.

Physical Characteristics

Base Weight	92 g/m ²
Calliper	115 microns
Opacity	94%
Brightness	115

Dimensions

Code	Width		Length
023R01443	A0	841mm	100m
023R01444	A1	594mm	100m

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture.
- Ensure that roll ends are protected and that the edge of these media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt. It is recommended that cotton gloves be used for handling to avoid fingerprints.
- The printing environment should be kept near optimal conditions while using this material (21 °C & 50% R.H.). An increase in humidity or temperature can cause printing malfunctions. Head crashes and carriage jams may occur if used outside of these conditions.
- Shelf life of this material is 2 years if kept in original packaging as specified.
- Folding or creasing prints can result in some loss of image.
- Laminate with thermal laminates if longer durability is required.

Description

A 95 g/m² medium grade, bright white paper for use in 360 dpi print mode. It provides good image quality and is well suited for general display applications. It also meets the line width specifications for GIS/CAD Engineering applications.

CAUTION: This material is sensitive to excessive temperature and humidity and can cockle if subjected to conditions outside of its capability range (e.g. Laminating temperature).

Applications

Good for all general graphics, such as posters, courtroom graphics, customer, sales and boardroom presentations, point of sale graphics, framed images, trade shows, museum signage, in-house graphics, merchandising materials, mounted prints, exhibit and corporate graphics, promotional displays, sample prints/check-plots, directional display and map reproductions.

Physical Characteristics

Base Weight	95 g/m ²
Calliper	118 microns
Opacity	94.5%
Brightness	115

Durability	Indoor Laminated	5 years
	Indoor Unlaminated	6 months
	Outdoor Laminated	18 months
	Outdoor Unlaminated	2 days

Dimensions

Code	Width	Length
023R01424	54"	1372mm
023R01423	50"	1270mm
023R01422	42"	1067mm
023R01425	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt. It is recommended that cotton gloves be used for handling to avoid fingerprints.
- Shelf life of this material is 2 years if kept in original packaging as specified.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- Do not fold or crease prints.
- Laminate only with hot melt laminates if satin or gloss finishes are required, or if protection from UV, moisture or abrasion is necessary for extra durability.

Description

A 125 g/m² medium grade, bright white paper for use in 360 dpi print mode. It provides good image quality and is well suited for general display applications. It also meets the line width specifications for GIS/CAD Engineering applications.

Applications

Good for all general graphics, such as posters, courtroom graphics, sales and boardroom presentations, point of sale graphics, framed images, trade shows, museum signage, in-house graphics, merchandising materials, mounted prints, exhibit and corporate graphics, promotional displays, sample prints/check-plots, directional display and map reproductions.

Physical Characteristics

Base Weight	125 g/m ²	Durability	Indoor Laminated	5 years
Calliper	168 microns		Indoor Unlaminated	18 months
Opacity	98%		Outdoor Laminated	18 months
Brightness	115		Outdoor Unlaminated	3 days

Dimensions

Code	Width	Length
023R02064	54"	76m
023R02066	42"	76m
023R02067	36"	76m

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt. It is recommended that cotton gloves be used for handling to avoid fingerprints.
- Shelf life of this material is 2 years if kept in original packaging as specified.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- Do not fold or crease prints.
- Laminate only with hot melt laminates if satin or gloss finishes are required, or if protection from UV, moisture or abrasion is necessary for extra durability.

Description

A premium quality, all-purpose paper with a smooth matt print surface and extra features for high-volume 360dpi presentation printing. The front side coating is high-white and has higher ink capacity to enable stronger colour reproduction. The rear of this paper is coated with a barrier to prevent ghosting from one image to another. Suitable for thermal laminates. Use for all presentation applications.

Applications

Good for all presentation graphics such as posters, courtroom graphics, corporate presentations, point of sale graphics, framed images, trade show graphics, museum signage, in-house graphics, merchandising materials, mounted prints, exhibit graphics, promotional displays, corporate graphics, mural panels, media decals, backlit displays, laminated prints, fine art reproductions, photo-realistic imaging, proofs, directional display and map reproductions.

Physical Characteristics

Base Weight	115 g/m ²	Durability	Indoor Laminated	5 years
Calliper	146 microns		Indoor Unlaminated	6 months
Opacity	94%		Outdoor Laminated	2 years
Brightness	107		Outdoor Unlaminated	Not recommended

Dimensions

Code	Width	Length
023R01627	54"	1372mm
023R01628	50"	1270mm
023R01629	42"	1067mm
023R01630	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt. It is recommended that cotton gloves be used for handling to avoid fingerprints.
- Shelf life of this material is 2 years if kept in original packaging as specified.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- Print in 360dpi print mode only.
- Laminate only with hot melt laminates if satin or gloss finishes are required, or if protection from UV, moisture or abrasion is necessary for extra durability.
- The fine structure of this paper can cause laminated graphics to split if subject to frequent flexing such as with some pop-up exhibition display systems.

Description

A premium quality, medium-weight paper, designed for optimum performance in 720 dpi print mode. It is specially coated to accept the high level of ink saturation and precise dot placement required for 720 dpi imaging. Use for all high quality presentation applications where sharp lines, crisp text and maximum colour gamut are required. *NOTE: For use with Thermal laminates only.*

Applications

Good for all highest quality presentation graphics, such as posters, courtroom graphics, customer, sales or boardroom presentations, point of sale graphics, framed images, trade show graphics, museum signage, in-house graphics, merchandising materials, mounted prints, exhibit graphics, promotional displays, corporate graphics, backlit display, fine art reproductions, photo-realistic imaging and map reproductions.

Physical Characteristics

Base Weight	125 g/m ²
Calliper	170 microns
Opacity	92%
Brightness	75

Durability	Indoor Laminated	15 years
	Indoor Unlaminated	3 months
	Outdoor Laminated	3 years
	Outdoor Unlaminated	Not recommended

Dimensions

Code	Width	Length
023R01363	54"	1372mm
023R01364	50"	1270mm
023R01365	42"	1067mm
023R01181	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture. Shelf life is 2 years if kept in original packaging.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt. It is recommended that cotton gloves be used for handling to avoid fingerprints.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- Print in 720 dpi print mode only.
- Laminate only with hot melt laminates if satin or gloss finishes are required, or if protection from UV, moisture or abrasion is necessary for extra durability.
- Specific settings are required to obtain acceptable laminate adhesion when using some laminates and laminators. Higher temperature settings and slower speed may be necessary. Refer to the *Lamination Procedures* section of this guide for specific settings.
- Take extra care when handling 720 dpi prints after lamination to avoid splitting the laminate adhesion to the paper. Do not tap edges on tables, counters, etc. Roll images loosely (no smaller than 3" in diameter).

Description

This heavyweight presentation paper is suitable for heavier ink loading and can be printed in either 360 or 360x720dpi mode. The high ink capacity allows production of bright dense images and a broad colour gamut. The higher base weight and bulk gives strength and stiffness and therefore improved handling and better performance without an over-laminate. Nevertheless an over-laminate is recommended to preserve the quality of imaging best suited to this paper. The extra calliper helps to avoid ghosting for high-speed, high-volume print production.

Applications

Ideal for retail graphics Good for all presentation graphics, such as posters, courtroom graphics, customer, sales or boardroom presentations, point of sale graphics, framed images, trade show graphics, museum signage, in-house graphics, merchandising materials, mounted prints, exhibit graphics, promotional displays, corporate graphics, mural panels, media decals, laminated prints, fine art reproductions, photo-realistic imaging, proofs, directional display and map reproductions

Physical Characteristics

Base Weight	160 g/m ²	Durability	Indoor Laminated	5 years
Calliper	200 microns		Indoor Unlaminated	1 year
Opacity	97%		Outdoor Laminated	2 years
Brightness	100		Outdoor Unlaminated	3 months

Dimensions

Code	Width	Length
023R01437	54"	1372mm
023R01438	50"	1270mm
023R01439	42"	1067mm
023R01440	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture. Shelf life is 2 years if kept in original packaging.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt. It is recommended that cotton gloves be used for handling to avoid fingerprints.
- Use within the temperature range 18-30 °C and relative humidity of 40-60%.
- For use in either 360 dpi or 360x720dpi print modes. Ensure the appropriate colour profile and resolution setting is used when imaging a file. If an image must be printed in 360x720dpi print modes, the digital file must be sent to the RIP twice (once using 360dpi settings, and again using 720 dpi settings). The profile settings MUST match the printer setting (i.e. DO NOT print an image with 720dpi printer settings if the 360dpi colour profile was used, and vice versa).
- Laminate only with hot melt laminates if satin or gloss finishes are required, or if protection from UV, moisture or abrasion is necessary for extra durability.

Description

This matt white water-resistant poster paper is inherently opaque but has a blue back to reinforce the highest possible opacity to meet the requirements of billboard poster applications as is the case with traditional screen print papers for this application. It is suitable for a wide range of indoor graphic applications too, but is primarily designed for outdoor use without lamination. Wet strength is suitable for soaking as part of the bill posting process. High ink capacity allows bright prints with excellent colour density and gamut. Tested and approved by the Swiss billboard association APG and other authorities. Compatible with commonly used adhesives, application practices and Northern European weathering to meet the needs of billboard advertising specifiers such as Viacom.

Applications

Excellent for all single or multi panelled billboard applications: Bus shelters, subway advertisements, sporting event signage and promotions, outdoor festival signs and displays, outdoor markets, construction signs, indoor presentation applications. Also excellent as a low cost backlit display for such applications as bus shelter advertising.

Physical Characteristics

Base Weight	120 g/m ²	Durability	Indoor Unlaminated	1 year	
Calliper	155 microns		Outdoor Unlaminated	6 months	
Opacity	98%				
Brightness	100				

Dimensions

Code	Width		Length
023R01420	54"	1372mm	76m
023R01429	50"	1270mm	76m
023R01614	42"	1067mm	76m
023R01421	36"	914mm	76m

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, out of direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store rolls in original carton and wrapper to protect from dust and moisture. Shelf life is 2 years if kept in original packaging as specified.
- Ensure that roll ends are protected and that edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- Wet paper at least 8 hours prior to pasting. Longer soaking has no negative impact on the paper's strength. Ensure appropriate microbiological precautions.
- This paper may expand up to 2.5% when wet. If intended installation requires exact size consider imaging the design approximately 98% to compensate for possible expansion.
- Let the graphic dry for at least 24 hours prior to soaking and installation.
- This is a same day paste and post product. Let soak in water for 1 hour prior to pasting to minimise wrinkles during installation. Can be soaked in water for up to 48 hours prior to use.
- Do not use anti-freeze during billboard installation as ink adhesion may be lost.
- Recommended Pastes:
 - Zellura UST
 - Natural Paste (Fish Paste: K. Blattman, potato starch: AVEBE)
 - Tylose C 6000, Planatol & Chimcoll (contains biocide, difficult to dissolve)
- Lamination is not required and this paper may not adhere well to some laminate films.

Description

This water-resistant poster paper has its opacity reinforced with a blue back to meet the requirements of billboard poster applications, as is the case with traditional screen print papers for this application. It is suitable for a wide range of indoor graphic applications too, but is primarily designed for outdoor use without lamination and is suitable for soaking as part of the bill posting process. Tested with authorities for compatibility with the various adhesives, application practices and Northern European weathering, meet the requirements of billboard advertising and standard specifiers such as Viacom for most outdoor campaigns.

Applications

Excellent for all single or multi panelled billboard applications: Bus shelters, subway advertisements, sporting event signage and promotions, outdoor festival signs and displays, outdoor markets, construction signs, indoor presentation applications. Also excellent as a low cost backlit display for such applications as bus shelter advertising.

Physical Characteristics

Base Weight	120 g/m ²	Durability	Indoor Unlaminated	1 year
Calliper	150 microns		Outdoor Unlaminated	4 months
Opacity	97%			
Brightness	95			

Dimensions

Code	Width	Length
023R02180	54"	1372mm
023R02181	50"	1270mm
023R02182	42"	1067mm
023R02183	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, out of direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store rolls in original carton and wrapper to protect from dust and moisture. Shelf life is 2 years if kept in original packaging as specified.
- Ensure that roll ends are protected and that edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- Wet paper at least 8 hours prior to pasting. Longer soaking has no negative impact on the paper's strength. Ensure appropriate microbiological precautions.
- This paper may expand up to 3% when wet. If intended installation requires exact size consider imaging the design approximately 98% to compensate for possible expansion.
- Let the graphic dry for at least 24 hours prior to soaking and installation.
- This is a same day paste and post product. Let soak in water for 1 hour prior to pasting to minimise wrinkles during installation. Can be soaked in water for up to 48 hours prior to use.
- Do not use anti-freeze during billboard installation as ink adhesion may be lost.
- Recommended Pastes:
 - Zellura UST
 - Natural Paste (Fish Paste: K. Blattman, potato starch: AVEBE)
 - Tylose C 6000, Planatol & Chimcoll (contains biocide, difficult to dissolve)
- Lamination is not required and this paper may not adhere well to some laminate films.

Description

A nylon reinforced paper designed for producing vivid, full colour images in 360 dpi mode. The exceptional durability of this media provides maximum flexibility during post print handling allowing for edge sewing, taping and grommeting. It provides excellent laminate adhesion with pressure sensitive as well as thermal laminates. It is an economical paper alternative to using standard outdoor materials for indoor banner applications.

NOTE: For use with both Thermal and Pressure Sensitive overlaminates. Must be overlaminated on both sides of a print for long term outdoor use (more than 3 days exposure).

Applications

Excellent for all large format, indoor banner applications including retail, car showrooms, supermarkets, suspended ceiling displays, office parties, museums, art galleries, entranceways, office corridors, industrial signage (warnings, hazard, etc.) - vertical or horizontal.

As a laminated paper, this media can be utilised for all presentation applications like trade show backdrops, mounted prints, window posters, suspended ceiling displays, exhibition graphics, shopping centre displays and retail signage.

Physical Characteristics

Base Weight	236 g/m ²	Durability	Indoor Laminated	10 years
Calliper	280 microns		Indoor Unlaminated	1 year
Opacity	97%		Outdoor Laminated	2 years
Brightness	104		Outdoor Unlaminated	2 days

Dimensions

Code	Width		Length
023R01296	54"	1372mm	23m
023R01293	36"	914mm	23m

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture. Shelf life is 2 years if kept in original packaging.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt. It is recommended that cotton gloves be used for handling to avoid fingerprints.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- For use in 360 dpi print mode only.
- This material is suitable for standard finishing procedures for banners: Edges can be sewn and the banner can be punched for eyelets. To form large displays, panels should be overlapped 2-3 cm and seamed. A double stitched hem with a maximum of 5 stitches per inch is recommended.
- Laminate with either pressure or thermal laminates if prints are to be exposed to severe conditions, or if longer durability is required. Heavier weight thermal laminates work best on this paper. Use at least a 125 micron laminate to avoid showing an "orange peel" effect.

Description

A matt white film designed to produce vivid, full colour direct write digital images in 360 dpi mode. This tear resistant film provides instant drying with good ink fixation for high-definition, photo-realistic images. The matt finish of the base film offers an image surface with minimal light reflection from white or un-imaged areas, but does not dull the printed image. A true water resistant media for use as an alternative to paper in "field" projects or when graphics will be exposed to weather or rough handling. Finished with an over-laminate, this film has the strength, rigidity and dimensional stability for roll up and pop up displays.

Applications

Good for all presentation graphics, such as posters, courtroom graphics, customer, sales and corporate presentations, point of sale graphics, framed images, trade show graphics, museum signage, in-house graphics, merchandising materials, mounted prints, exhibition graphics, promotional displays and directional display.

Physical Characteristics

Base Weight	167 g/m ²	Durability	Indoor Laminated	2 years
Calliper	145 microns		Indoor Unlaminated	1 year
Opacity	94%		Outdoor Laminated	18 months
Brightness	95		Outdoor Unlaminated	7 months

Dimensions

Code	Width	Length
023R01451	54"	1372mm
023R01455	42"	1067mm
023R01453	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt. It is recommended that cotton gloves be used for handling to avoid fingerprints.
- Shelf life of this material is 2 years if kept in original packaging as specified.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- For use in 360 dpi print mode only.
- Laminate with either pressure or thermal laminates if prints are to be exposed to severe conditions, if longer durability is required, or if a satin or gloss finish is preferred.

Description

A versatile polyester film specifically coated to provide excellent image quality with rich deep colours and superior saturation and contrast. This polyester-based material is dimensionally stable with heat generated in a light box and ideal for all backlit applications, indoors and out. Image Details are sharp, and image clarity is excellent. Small text will not "break-up" or become fuzzy. Images will not "wash-out" when viewed under fixture lights, or seem too dark when lights are turned off.

Applications

Excellent for all displays with some degree of back illumination, artificial or natural, to boost display impact: Lobby signs, parking garage signage, transit shelters, airport fixtures, elevator displays, retail promotion, shopping centre directories, subway plans, kiosks, window display units, menu fixtures, retail/supermarket aisle signs, and convenience store signage.

Physical Characteristics

Base Weight	200 g/m ²	Durability	Indoor Laminated	2 years
Calliper	177 microns		Indoor Unlaminated	Not recommended
Opacity	60%		Outdoor Laminated	1 year
Brightness	75		Outdoor Unlaminated	Not recommended

Dimensions

Code	Width	Length
023R02430	54"	1372mm
023R02429	42"	1067mm
023R02428	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture. Shelf life is 2 years if kept in original packaging.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt. It is recommended that cotton gloves be used for handling to avoid fingerprints.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- For use in either 360 dpi or 360x720dpi print modes. Ensure the appropriate colour profile and resolution setting is used when imaging a file. If an image must be printed in 360x720dpi print modes, the digital file must be sent to the RIP twice (once using 360dpi settings, and again using 720 dpi settings). The profile settings MUST match the printer setting (i.e. DO NOT print an image with 720dpi printer settings if the 360dpi colour profile was used, and vice versa. Print 4-colour to achieve maximum colour densities for illuminated display without over-saturating with ink. Ensure the appropriate colour profile and resolution setting is used.
- For colour critical images, add a blank sheet of white paper to the back of the print and encapsulate. Ensure that there is at least a 4mm sealed laminate edge around the graphic.
- To enhance the appearance of an image when using this media by altering the digital file or to decrease banding during printing, follow the instructions provided elsewhere in this guide.
- Laminate images immediately, within 4-8 hours of printing, using *Thermal* laminates only.

www.xerox.com/iccprofiles.com

Description

This is a general-purpose, calendered self-adhesive white vinyl – pressure sensitive – that will adhere to a wide variety of smooth substrates with flat or gently curved surfaces using only the slight pressure of a hand or small tool (such as a squeegee). This PSV has a medium tack adhesive that enables good adhesion in service but will enable complete removal from substrates without the use of chemicals or heat. It is designed for use in all indoor, and most outdoor, PSV applications when properly constructed with an over-laminate.

The in receiver coating gives a bright white imaging surface with a good degree of water and scratch resistance, although lamination is recommended for prints requiring satin, high gloss or other finishes and/or prints requiring protection from dirt, abrasion or UV, for greater general durability. This media is suitable for pressure (cold) laminates but not for thermal (hot-melt) laminates.

Applications

For all indoor and some outdoor applications where the printed image is needed to adhere to a smooth, flat or slightly curved surface: General signage, retail and event promotions, trade show displays, galleries, museums, hallways, showrooms, markets, retail merchandising and display.

Physical Characteristics

Base Weight	290 g/m ²	Durability	Indoor Laminated	2 years
Total Calliper	275 microns		Indoor Unlaminated	6 months
Vinyl Calliper	140 microns		Outdoor Laminated	1 year
Opacity	98%		Outdoor Unlaminated	2 months
Brightness	118			

Adhesive	Clear, removable, acrylic , pressure-sensitive
Release Liner	Coated paper 120g/m ²
Min. Surface / Ambient Air Application Temp.	10° C
Application Surface	Flat or slightly curved

Dimensions

Code	Width	Length
O23R02405	54"	1372mm
O23R02404	42"	1067mm
O23R02403	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture. Shelf life is 12 months if kept in original packaging.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt.
- Print within the temperature range 18-30° C and relative humidity of 40-60%.
- Clean and prepare substrates following instructions detailed elsewhere in this guide
- Freshly lacquered or painted surfaces should be allowed to dry or cure completely before self-adhesive vinyl is applied. Test compatibility of surfaces, paints or lacquers prior to application.
- This media is suitable for pressure (cold) laminates but not thermal (hot-melt) laminates.

Description

Vinyl designed for excellent image quality when used in either 360 or 720dpi print mode. This material is constructed of a tear resistant polyester base fabric embedded between two layers of white vinyl. It is water resistant, and designed for use in all banner applications indoors and most outdoor applications except where durability in extreme wind and weather conditions is required. Use standard finishing procedures for banners. Banner Vinyl gives excellent image permanence and does not require the use of an over-laminate unless subject to abrasion or extreme moisture.

Applications

Ideal for indoor and outdoor banner applications, e.g., art galleries, retail and event promotions, long hallways, showrooms, supermarkets, ceiling displays, museums, theatre lobbies, entranceways, petrol stations, car park advertising, backdrops, signage, and tradeshow.

Physical Characteristics

Base Weight	400 g/m ²	Durability	Indoor Laminated	2 years
Total Calliper	356 microns		Indoor Unlaminated	2 years
Opacity	98%		Outdoor Laminated	1 year
Brightness	95		Outdoor Unlaminated	1 year
Tensile strength	>1500 N/5cm warp, >1400 N/5cm weft			
Tearing resistance	>70 N warp, >70N weft			
Temperature stability	-10deg C to +60 deg C			
Dimensional stability	<0.5%			
Fire Rating	M2			

Dimensions

Code	Width	Length
O23R01418	54"	1372mm
O23R01419	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture. Shelf life is 2 years if kept in original packaging.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- Avoid over-saturating with ink for such as CMY / CMYK black. Reduce individual and overall ink limits (<220%) to improve drying and production speed. Too much ink may cause light "oil-spots" to appear. Working at lower ink limits improves image weather resistance.
- Some banding may be evident close viewed but from the likely viewing distance for banner graphics it should be invisible. Unidirectional printing can help reduce banding.
- This is a heavily coated, extremely thick material. It may be easier to run this media from the back roller and an automatic cutter should not be used during media loading or print production.
- Do not fold images. Use "slip sheets" to prevent image offset from one print to another.
- Over-lamination is not required except for conditions of extreme moisture or abrasion. Use Pressure Sensitive laminates only.

Description

Tear resistant, free-flowing polyester fabric designed for optimum image quality in either 360 or 720 dpi print mode, for use indoors or outdoors against a flat surface without lamination. A functional fabric that can be "finished" to become a vast array of graphics. It has a satin sheen on the backside.

Applications

Ideal for indoor and outdoor banner applications, hanging banners, table fronts, backdrops, window decorations, ceiling displays, drapes or flags: Trade shows, art galleries, retail and event promotions, entrance lobbies and corridors, showrooms, supermarkets, shopping centres, restaurants, ceiling displays, museums, sport arenas, political campaigns ...

Physical Characteristics

Base Weight	160 g/m ²	Durability	Indoor Unlaminated	2 years
Total Calliper	250 microns		Outdoor Unlaminated	1 year
Tensile strength	>1500 n/5cm warp, >1400 n/5cm weft			
Tearing resistance	>70 N warp, >70N weft			
Temperature stability	-10deg C to +60 deg C			
Dimensional stability	<0.5%			

Dimensions

Code	Width	Length
023R01415	54"	1372mm
023R01414	42"	1067mm
023R01416	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture. Shelf life is 2 years if kept in original packaging.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- Fabric is coated over a textured, porous surface. The coating layer on the peaks of the weave may develop a tendency to "rub-off" if over saturated with ink such as in areas of CMY / CMYK black. Working at lower ink limits improves image weather resistance.
- An automatic cutter should not be used during media loading or print production.
- Can be handled normally immediately after printing. Use cotton gloves to minimise image rub-off during installation. Only a small amount of moisture from hands can increase rub-off.
- Do not fold images. Use "slip sheets" to prevent image offset from one print to another.
- Can be stitched with care. Avoid "bunching-up" when sewing. Grommets can be used.
- Over-lamination is not required.
- Outdoors this product should be fixed to a flat structure e.g. building wall. If hung without protection wind may cause the coating surface to crack, leading to image deterioration.

Description

Tear resistant polyester fabric designed for fine image quality in either 360 or 720 dpi print mode, for use indoors or outdoors against a flat surface without lamination. This fabric has a fire retardant coating and is certified M2 flame retardant for use in fire sensitive indoor spaces. A functional fabric that can be "finished" to become a vast array of graphics.

Applications

Ideal for indoor and outdoor banner applications, e.g., art galleries, retail and event promotions, long hallways, showrooms, supermarkets, ceiling displays, museums, theatre lobbies, entranceways, petrol stations, car park advertising, backdrops, signage, and tradeshow.

Physical Characteristics

Base Weight	250 g/m ²	Durability	Indoor Unlaminated	2 years
Total Calliper	260 microns		Outdoor Unlaminated	1 year
Tensile strength	>1000 N/5cm warp, >800 N/5cm weft			
Tearing resistance	>70 N warp, >70N weft			
Temperature stability	-10deg C to +60 deg C			
Dimensional stability	<0.5%			
Fire Rating	NF P 92-503 - Class M2, DIN-4102 - Class B1			

Dimensions

Code	Width	Length
023R02002	54"	1372mm
023R02004	42"	1067mm
023R02005	36"	914mm

Compatibility

Xerox X2
Xerox Xpress
Seiko IP4XXX

Operating Instructions

- Store in a cool, dry environment, free from direct sunlight, within temperatures of 10-35°C and non-condensing relative humidity of 30-70%. Store the product in its original carton and wrapper to protect from dust and moisture. Shelf life is 2 years if kept in original packaging.
- Ensure that roll ends are protected and that the edges of the media are not damaged. If the media edges are not flat this can result in damage to the printer.
- Keep the image surface dry and free of grease, oil, silicones and dirt.
- Use within the temperature range 18-30°C and relative humidity of 40-60%.
- Avoid over-saturating with ink for such as CMY / CMYK black. Reduce individual and overall ink limits (<220%) to improve drying and production speed. Too much ink may cause light "oil-spots" to appear. Working at lower ink limits improves image weather resistance.
- Some banding may be evident close viewed but from the likely viewing distance for banner graphics it should be invisible. Unidirectional printing can help reduce banding.
- This is a heavily coated, extremely thick material. It may be easier to run this media from the back roller and the automatic cutter should not be used during media loading or print production.
- Do not fold images. Use "slip sheets" to prevent image offset from one print to another.
- Over-lamination is not required.

General Hints & Tips

Here are few tips that may help regardless of media type or application. Beyond these general tips a series of more specific suggestions are given for several of the key application categories.

PrePress	<ul style="list-style-type: none"> • Include crop marks for trimming. Precondition the material in a controlled printer environment for 24 hours prior to printing.
Lamination	<ul style="list-style-type: none"> • Use only laminates approved for use with the base media and the application. • For outdoor use, prints should be fully encapsulated with a 4-6mm sealed edge. • Laminate papers at higher temperature and slower speed to ensure successful adhesion.
Trimming	<ul style="list-style-type: none"> • ON-PRINTER: Trim with sharp razor or automatic cutter. Check knives to make sure they're sharp and properly adjusted to cut cleanly with minimal dust. • OFF-PRINTER: Ensure images for encapsulation are individually pre-trimmed flush to the edge of the required panel size prior to being laminated. • OFF-LAMINATOR: Trim with sharp hand cutter or large format trimmer. Take precautions to keep prints from slipping or falling to the floor, especially stacked.
Handling	<ul style="list-style-type: none"> • PRINTS are easily damaged when handled improperly. If not laminated, avoid contact with laser printer or photo-copier output. Use a slip-sheet when rolling several posters together. Use low tack tape to secure the roll. Do not use rubber bands around an unlaminated print.
Storage	<ul style="list-style-type: none"> • MEDIA: Store material in all original packaging in a temperature and humidity controlled room. Keep away from direct sunlight, external doorways and heating/air conditioning vents. If rolls are stored vertically, use core hangers and keep rolls away from direct contact with floor. Do not expose graphics to extreme temperatures.
Mounting	<ul style="list-style-type: none"> • Mount graphics to a substrate e.g. foamboard. Clean and coat the substrate prior to mounting the graphic, or apply an adhesive coating to the back of the laminated print. • Use the overlap as a skew allowance. Mount a middle panel first to avoid a cumulative skew effect on the entire image. Beginning on either end may result in a skew effect that does not allow panels to match. • Once mounted, the graphic is flipped face down and the excess image is trimmed to fit the edges of the board.
Shipping	<ul style="list-style-type: none"> • Use a tube whenever possible to ship rolled images. If shipping flat, sandwich posters securely between rigid packaging. • The corners of a Mounted Print are easily damaged if packaged improperly. • Carriers may not handle boxes carefully, so take the time and expense before the job is sent to the customer to prepare for any possible mishandling while en route.
Printing	<ul style="list-style-type: none"> • Choose the appropriate "Print Mode" for the application and/or media. • "Nest" images as groups based on similar finishing requirements.
	<ul style="list-style-type: none"> • Use the media specific RIP curve available with your front-end software. If one is not available, start with a profile setting for a similar media type as a base, and make alterations to achieve acceptable output.
	<ul style="list-style-type: none"> – DON'T COMPARE the image quality of one media to another.

1. Poster Graphics

1.1 Single Panel Poster Graphics

Single panel posters are generally intended to be viewed from a short distance. A complete design that is contained within one print is considered a poster, or a "single panel", regardless of whether multiple copies are involved.

Unlaminated posters are images printed on the base material of choice only, such as paper or film, without being "finished" with an over-laminate. These posters are not protected from moisture or abrasion damage, and are generally for one-time or short-term use.

Laminated posters have a protective layer on the front and/or back of the print to protect from minor abrasion damage, moisture, and handling. Laminates increase print rigidity, may increase image longevity, and can provide a glossy, satin or even textured finish to the poster. Laminating is recommended for long-term indoor as well as short-term exterior applications. Once a poster is laminated it can be installed with tape, Velcro, pins, tacks, or grommets. It can also be mounted to a substrate or put into a frame or fixture.

1.2 Proofs / Check-plots

Any design printed prior to final approval or project completion to check colour, layout, or content is considered a proof. This application does not require good image density, clarity, high resolution, or quality base material. In most cases, the print is to be used only once, then discarded. Multiple versions with only slight changes may need to be produced. Therefore, an economical grade of paper is preferred as an alternative to a more expensive, presentation grade paper.

1.3 Mounted Prints

"Mounted" prints, or "Display Graphics", are prints applied to a rigid material. The added support of the mounting surface increases the durability and life of the print. This type of post-print finishing can be utilised for all types of graphics. There are several lamination and base material options for this application, all dependent on customer requirements for the final "look" of presentation. When shipping, proper packaging is critical as mounted prints can damage easily.

1.4 Multi-Panel Images

Multi-panel images are prints of virtually unlimited size that require special pre-press setup and post-print construction. Accurate measurements, forethought and planning are critical to this application. The pre-press operator must obtain specific output expectations from the end-user or installer to ensure that the resulting output is successful. With the help of a computer layout programme, images are "tiled" to specific panel dimensions, incorporating overlap or "butt-seam" construction.

1.5 Billboards

Display size of billboards, as well as appropriate design, will vary. Quick turnaround and image flexibility are a key advantage of digital printing methods. The final image quality depends not only on prepress and production, but also proper pasting and installation. Most limitations in expected life of billboards is due to pasting methods. Flagging, chalking, and other problems are due primarily to installation procedures.

1.6 Billboard Application Tips

- Choose the appropriate "Print Mode" for the application and/or media. X2 is designed to provide sellable output at high speed. There are a number of printer and RIP settings that help X2 efficiency for high volume billboard printing such as adjusting resolution and dot screening. Please ask your Xerox supplies contact for further information.
- Panels should be created with a minimum 2-inch internal bleed and a 2-inch external bleed.
- Panel size should not exceed maximum width one person can handle (48" wide) but is usually determined by standard as 42".
- Carefully label panels for easier installation (eg: 1 of 4, 2 of 4, etc.).
- The whole print may be wetted with paste immediately before application. Use a recommended billboard paste but do not add alcohol or glycol as this dissolves inks.
- POSTING: Installer should follow standard posting procedures. Ensure mounting surface is clean, dry and free of rust and debris. Loose or peeling portions of a previous layer should be removed and rough spots should be feathered by sanding. Unfold wet panel. Align top and edge to be joined. Light pressure with a soft smoothing brush or squeegee should be used to smooth wrinkles and air pockets. Work from the centre towards the edges.

2. Backlit Display

2.1 Application Characteristics

A high quality, photo-realistic graphic placed in a fixture that is illuminated from the rear is a "backlit" display. The fixture is typically mounted to a wall or stand.

The image quality of a backlit graphic is critical: The image should be sufficiently dense so that it does not appear "washed-out" when viewed under fixture lights, but should not be too dark (or dense) when the back lights are turned off. Most back lit displays are printed on polyester backlit film which gives a completely uniform light transmission, is dimensionally stable, staying flat and in place under the temperature conditions inherent with light-boxes.

Some papers are also suitable provided their formation, the structure of the paper itself, doesn't give a mottled appearance when illuminated. Paper backlit offers reduced cost in interior or short-term exterior displays, and this can allow customers to change messaging more frequently than viable with a traditional polyester film. Using a blue backed paper helps to provide a more even light diffusion, masking any mottling from paper fibre formation that becomes evident as a result of the light. Extra opacity helps to maintain strong image colour both lit and unlit although backlit films generally should be capable of supporting high levels of ink coverage to produce more brilliant colour display.

3. Self-Adhesive Vinyl

3.1 Application Characteristics

Pressure Sensitive Vinyl (PSV) or self-adhesive vinyl can be directly applied to a range of smooth, flat, or gently curved surfaces such as metal, glass, stainless steel, painted surfaces, etc. This capability saves additional steps for graphics production during imaging, finishing, and print installation. These media are designed for short-term promotional graphics, but also for long-term signage and specialist applications such as vehicle wrapping. A range of vinyls serves this variety of application.

Vinyls in the Xerox range are not suitable for applications with corrugated shaping, rivets, or complex contours. A specialist cast vinyl would be appropriate and specialist application techniques are necessary.

3.2 Print Finishing

Trimming	<ul style="list-style-type: none">• ON-PRINTER: DO NOT use the automatic cutter. Manually trim. Always check the knives to make sure they are sharp and properly adjusted to provide a clean cut.• OFF-PRINTER: it is best to unroll the finished graphics onto a table and cut between images. Handle the material in roll form for shipping or subsequent roll-to-roll over-lamination.• When winding onto a core, tape the outer wrap to the roll to keep it wound tightly. Wind onto as large a core as possible, 3" or larger. Wind the roll image side out. Wrap the roll in plastic or place in a sealed tube to prevent moisture damage.
Lamination	<ul style="list-style-type: none">• Xerox oil inkjet PSV is designed for short term promotional graphics and should always be over-laminated.• Use Pressure Sensitive laminates only.• Laminate between 30 minutes and 24 hours after printing, as this material is sensitive to moisture curl.• ENCAPSULATION: The over-laminate vinyl should be trimmed to provide 6-19 mm of material beyond each edge of the pre-cut graphic to seal the edges of the vinyl to prevent moisture damage to edges of the print.

- Cut a length of over-laminate film to properly fit the graphic (including necessary overlap).
- Feed the leading edge of the over-laminate (still on the liner, liner side down) into the laminator. Stop the laminator once the leading edge has passed through the nip.
- Split the over-laminate film away from the liner, draping the over-laminate film over the top laminating roll.
- Place the printed graphic on the over-laminate liner with the printed side facing the adhesive side of the over-laminate film. Take care to align the graphic to make sure that at least 12 - 20mm of overlamine film extends beyond each edge to seal the edges of the print after application.
- Start the laminator and run the graphic completely through the nip.
- Stop the laminator and trim the overlaminated graphic to size, allowing the overlamine to extend beyond the edge at least 12 -20 mm.

3.3 Surface Cleaning and Preparation

It is the responsibility of the applicator to ensure all substrates are suitable and appropriately prepared to avoid problems with a decal either not adhering or adhering too firmly such that removal damages the substrate. The substrate surface must be completely clean, smooth, and dry. There must be no dirt, oil, grease or solvent residue remaining.

Prior to cleaning with solvents, test the cleaning solvent on an inconspicuous area of the application surface to check for potential damage. Always test adhesion and paint/adhesive compatibility prior to installation.

The following cleaning and surface preparation conditions must be followed immediately prior to application. Failure to adhere to these requirements can cause adhesion loss and therefore reduce the durability and performance level of the decal.

Pre-Cleaning	<ul style="list-style-type: none"> Remove all dirt and grime with soapy water. If grease, oil, wax, etc. are present, the substrate must be scrubbed with a solvent wipe (Xylene, heptane, ethylacetate, denatured alcohol).
Final Preparation	<ul style="list-style-type: none"> After proper cleaning, the substrate surface should be thoroughly wiped by using a clean rag saturated with a cleaner such as DuPont's Pre-Sol Brand Solvent 3919S, Rapid Prep by Rapid Tack, or Sherwin Williams R7K-156. Other solvents such as IPA (isopropyl alcohol), VM&P Naptha, Xylol, or lacquer thinner may also be used instead of DuPont 3919S. However, care should be taken to assure that the final dry wiping is accomplished prior to the solvent evaporating.

3.2 Painted Surfaces

Avoid highly pigmented or dull metallic paints (which tend to chalk and flake), latex paints, paints containing migratory agents such as chlorinated waxes and silicone, oil alkyd primers and enamels. If applying film to a newly painted surface, follow all drying and curing instructions. All air-drying paints should be allowed to dwell at or near room temperature and humidity conditions for one week prior to vinyl application. Chalked and otherwise weathered paint surfaces must be refurbished or refinished.

High quality exterior grade paints are recommended as a good base for self adhesive vinyl.

3.3 Other Surfaces

Tin	Including Alloys of Tin, Copper, Magnesium, Lead: Not recommended.
Stainless Steel	Stainless steel tends to maintain cold surface temperatures longer than most substrates. Use a heater immediately before and after application to accelerate bond.
MDF / Wood	Generally not recommended.
Aluminum, ABS, Acrylics	Use high quality exterior grade paints.
Galvanised Steel	Ensure the substrate is properly galvanized, it is recommended to test all galvanized steel substrates and prepare thoroughly before application.
Poly-carbonate Fibreglass	With a soft cloth wipe the surface with isopropyl alcohol. Inadequate preparation may result in air bubbles. Test for out-gassing
Glass	Glass must be perfectly clean. Remove anything attached to the surface using a scraper. Spray the glass with cleaning solution and dry using a soft rubber squeegee. Wetting the glass with cleaning solution (DuPont Prepsol or Isopropyl Alcohol) will reduce the chance of scratching the surface during the scraping process.

3.4 Installation

Before starting installation, consult the appropriate product data sheet for information regarding application temperature range and recommended substrates. These factors are critical to a successful application and future decal performance. If the substrate surface temperature is below minimum requirements, the substrate must be heated to application temperature to accelerate the ultimate adhesion of the vinyl.

Mark the decal location on the application surface. For multi panel decals the overlap should be 6-12mm.

Generally do not use application fluid or the "wet method" for installation as this can reduce ultimate adhesion or cause fogging with clear vinyls.

The decal must be squeegee-ed before and after pre-mask removal. During pre-mask removal, decals are exposed to potential edge lifting. In order to eliminate this, re-squeegee the decal (especially the edges).

3.5 Top Hinge Installation Method

Position the decal on the application surface using small pieces of tape to hold it in place. Once the decal has been properly registered, apply a masking tape hinge along the top edge of the decal. Flip the decal up over the hinge and remove the liner. Hold the decal away from the application surface with one hand and squeegee down from the top centre towards the sides using short, firm, overlapping strokes to prevent wrinkling of the vinyl and minimize air bubbles. Remove the masking tape hinge (if one was used). Re-squeegee the top edge to which the tape hinge was applied using overlapping, upward strokes. Re-squeegee the entire decal using very firm squeegee pressure, including all edges. Puncture any air bubbles with a straight pin and re-squeegee from the edge of the bubble towards the puncture.

3.6 Professional Installation

The above information provides basic information on how to apply PSV graphics. The instructions are designed to help ensure success across a broad range of applications. Depending on the size and complexity of applications, a certain amount of expertise is needed. Professional installers can be hired to ensure proper application of finished graphics and could be considered for applications with multiple panels to be registered, complex surfaces or where harsh environmental conditions are involved.

3.7 Removal

Removal method has to be adapted to suit the specific substrate surface. This guide gives only a general removal overview of hot and cold methods. Always test a small area prior to removal.

- **Hot Method** Warm the entire decal by holding a heat source 6-12" from the surface. After 30-60 seconds, slowly pull back a corner of the decal. Pulling and lifting slowly and steadily, at less than 90° angle, should avoid breaking the vinyl and should remove most of the adhesive. If the decal becomes hard to pull, stop and reheat it. Remove residue by wiping with a cloth saturated with decal remover.
- **Chemical Method** Apply decal remover with a spray dispenser and, after 10-15 minutes, the vinyl will begin to bubble and can be peeled from the substrate. If the vinyl doesn't remove easily, use a hot water pressure washer with a pressure of 2500psi and temperature of 70-75° C. Keep the water stream narrow and the wand 50cm from the surface. Repeat if necessary.
- Adhesive residue may be removed by wiping with a clean saturated rag of XXL1000 decal remover, heptane, Xylene, and/or mixture of 75% MEK/25% Toluene.

4. Banners

4.1 Application Definition

Banners display short messages in a large format for viewing from a distance. The success of this application largely depends on the design element used as well as the physical placement of the banner. Banners can be installed virtually anywhere from ceilings in shopping outlets to table fronts for exhibit halls. Durable materials make for the best choice when creating a banner because of the extreme amount of post print finishing necessary for this application, and particularly because of the heavy stresses placed on large area banners by wind and weathering. In outdoor applications, heavyweight fabrics and vinyl are used because of their ease of use and durability. In less demanding conditions paper and lightweight fabric banners can be considered.

4.2 Banner Vinyl

Finished vinyl banners need to have appropriate properties to allow hemming or joining by welding or stitching, application of eyelets and fixing components, and of course they must withstand a level of weathering depending on the display environment. Strength is less determined by overall weight but is more a function of the way in which the vinyl is constructed, and the reinforcing textile which forms the core of the material.

4.3 Fabrics

The high strength and range of finishing options for fabrics make them ideal for use in banner, flag, drapery, and panelled backdrop applications. Fire retardant properties are a consideration when a graphic is to be displayed in environments with the most stringent regulations.

Banner Fabric is a tear resistant, polyester fabric and is a functional, flexible substrate that can be "finished" to become a vast array of graphics. The free flowing nature of the product makes it suitable for use as cloth banners, tradeshow or theatre backdrops, flags, window decorations, table fronts and partition dividers.

Flame retardant banner fabric has some similar characteristics but has reduced conformability as a result of the fire retardant coating. Those fire retardant properties enable its use in situations where fire certification is important or an absolute requirement.

4.4 Fabric Application Tips

Printing	<ul style="list-style-type: none"> • Avoid overly heavy ink coverage on fabrics or images may rub off easily. Colour enhancement to the digital file before RIP processing (such as altering single colour blacks to 4 colour blacks, etc.) may help to increase colour intensity. • LOAD banner vinyl or fabrics in the rear roll position in an X2. • Print test images and Pantone charts prior to beginning any production run. This will help to set expectations as to the type of colours that this material will yield.
Lamination	<ul style="list-style-type: none"> • Cloth/Canvas do not require the use of an over-laminate. A liquid laminate can be used.
Trimming	<ul style="list-style-type: none"> • DO NOT use the automatic cutter in the printer.
Stitching	<ul style="list-style-type: none"> • A double stitched hem with max. 5 stitches per inch is recommended. Unlaminated images are easily scratched – stitch hem side up so the sewing machine foot comes in contact with the rear of the print. • FINISH edges using normal procedures for scrim vinyl (grommets, stitching, tape, pockets, etc.). Standard banner tape purchased from a banner supply store is appropriate.
Handling	<ul style="list-style-type: none"> • Properly printed, banner vinyl and fabrics can withstand handling straight after printing. The coating sits over a porous surface, some on top of the peaks, some in the valleys of the weave; therefore, it may exhibit a tendency to "rub-off" if handled improperly.
Production Notes	<ul style="list-style-type: none"> • GROMMETS- place lengthways along the hemline of the banner so that the grommet is through two layers, and four in the corners. The folds can be taped with standard banner tape or sewn.

5. GIS, CAD, Engineering and Technical

CAD and GIS applications are generally less demanding for media than graphics printing. Ink and area coverage is lower for CAD and any areas of block colour shading are often only relatively pale colours with low levels of ink applied. Application requirements dictate the media selection for each specific job but the media types appropriate for these applications would include Line Art Paper, Coated Design Paper, Hi White Paper, Presentation Papers and perhaps White Matt Film

Other media types from the portfolio (eg. backlit film or fabric) could also be used for. However, the front-end software typically used in association with ColorgrafX X2 TECH printers may not provide the same level of image specific quality control per media as those supported for Graphic Art applications.

Expectations of Image Archive-ability

Archive-ability (Archive Stability) is defined as the potential for the collective attributes of a print, including the physical and chemical properties of the inks and media by which it was generated, to resist changes from their initial state during an indefinite period of storage within a controlled environment.

For prints generated within the approved specification for materials and conditions, Xerox expects image legibility, or print life, to be sustained for the normal observer, with regard to the following degrees of image permanence and durability afforded by the related conditions of referral:

- **High Image Permanence and Durability** – Print life of at least 100 years: Requires low frequency and duration of referral, or equivalent combinations, not to exceed 60 minutes of exposure per year.
- **Medium Image Permanence and Durability** – Print life of at least 50 years: Requires ordinary frequency and duration of referral, or equivalent combinations, not to exceed 12 hours of exposure per year.
- **Low Image Permanence and Durability** – Print life of at least 20 years: Requires high frequency and duration of referral, or equivalent combinations, not to exceed 208 hours of exposure per year.

NOTE: This statement excludes prints archived in improperly controlled environments, prints damaged in any manner during referral, regardless of circumstance, and prints subject to continuous referral. It remains contingent on printer component design and supplies formulations, which are subject to change at the discretion of Xerox.

Archival Conditions and Specification

Given the myriad of preparation techniques, which include folding, rolling, flat stacking and hanging of single or multiple prints, only image legibility is considered.

Archival Environment: There are 4 environmental components that affect image permanence, durability, and therefore legibility: Water content (% relative humidity), elemental content (e.g. salt, NaCl), radiation (exposure to light), and heat.

Xerox specifies an ambient archival environment of no greater than 70°F, 50% Relative Humidity, and total darkness. A temperature and/or humidity lower than 70°F/50%RH can afford additional increases in permanence, durability and Archive stability.

Conditions of Referral: Each time a print is referred, or removed from archive storage, its environment and, therefore, Archiveability is considered changed. Print referral is restricted to the indoor environment, utilising typical office (fluorescent) lights. Frequency is described as follows:

1. Low: once a year, or less, and not in excess 4 times per year.
2. Ordinary: more than 4 times per year, and not in excess of 12 times per year.
3. High: more than 12 times per year, and not in excess of 52 times per year.
4. Maximum: more than 52 times per year.

Duration of exposure to a non-archival environment is described as follows:

1. Low: No more than 15 minutes of per referral.
2. Ordinary: 0.25-1.0 hour per referral.
3. High: 1.0- 4.0 hours per referral.
4. Maximum: More than 4.0 hours per referral.

The state of continuous referral exists when a print is seldom or never placed in an archival environment during its life. Maximum frequency and maximum duration is considered as continuous referral.

Combining a degree of frequency with the matching degree of duration results in a specific number of hours per year through which the print can be exposed. The hours of exposure dictate the permanence and durability of an image, and the print life. Varying degrees of frequency and exposure can be combined to yield a general life expectancy in years.

Applications per Media Type

80g/m ² Line Art Paper	Most economical media - for line art graphics, check plots and proofs.
90g/m ² Coated Design Paper	Medium grade papers designed for GIS /CAD and general display applications excellent image quality at an economical price.
125g/m ² Hi White Paper	Premium quality, for high quality for 360dpi, photo-realistic graphic presentation imaging.
125g/m ² Presentation Paper 720 dpi	Premium quality, optimum performance in 720 dpi print mode. Use for all presentations with sharp detail and maximum colour gamut.
160g/m ² Presentation Paper	Heavyweight, photo-graphic quality presentation paper for high resolution images.
150 micron White Matt Film	Excellent image quality and vivid colour rendition. A true water resistant media for use as an alternative to paper in "field" projects.

Introduction

Lamination can be the most critical portion of graphics construction. Finishing the print offers a value-added service by the print provider that can produce higher revenues per print. Lamination protects the print from mechanical damage that may be caused by contact, handling or abrasion, but an over-laminate also protects prints from colour deterioration preventing reaction of atmospheric components with colourants over time.

- Laminate a graphic if it is to be exposed to extreme conditions or abrasion.
- Lamination adds a gloss or lustre finish, as well as enhancing colours (without altering the colour) depending on the laminate used.
- If the print is displayed under harsh lighting, use a matt finish to reduce glare.
- Use heavier grades of laminate to add bulk and stiffen prints or add a high gloss appearance.

Inappropriate lamination technique is the leading cause of material waste. This information is intended to be a starting point. Each laminator has its own characteristics, which vary depending upon ambient conditions, laminator model, settings and adjustments, age and condition of the laminator, etc. Temperature, pressure, speed and tension adjustments may need to be made to optimise laminate bond and to obtain flat graphics.

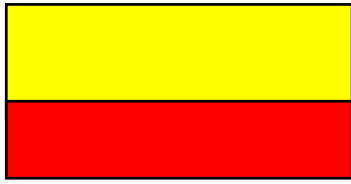
Generally, do NOT use low-melt laminates with oil inkjet prints. Xerox oil inkjet media require hot-melt thermal adhesive. Delamination can occur if the heat and pressure settings used are inappropriate specifically for oil inkjet prints: Oil inkjet requirements for laminating differ from aqueous and solvent inkjet prints.

Understanding Laminates

Use the appropriate laminate for your media and your application. Check the appropriate media specification sheet to verify if certain laminates are not appropriate.

Laminate Types	<p>THERMAL laminates consist of a polyester (PET) face film with heat-activated adhesive on one side. With heat applied to the adhesive via the laminator the adhesive melts (activates). Once the heat source is removed it sets within a few seconds.</p> <p>PRESSURE SENSITIVE laminates have a pressure sensitive adhesive applied to one side. This type of lamination does not use heat to activate the adhesive. Adhesive is activated by pressure alone.</p> <p>PET based laminates are durable and tough, with high tear and impact strength, excellent scratch resistance, and flexibility once applied. Since PET laminates do not contain plasticisers, they do not become brittle with age under normal conditions</p>
Laminate "Looks"	<p>GLOSS: provides maximum clarity and colour enhancement and is used when the customer desires a 'photo-glossy' look.</p> <p>SATIN / LUSTRE: gives a less glossy finish while maintaining excellent clarity and colour enhancement - should be used when there is concern about light reflections (glare) but the image benefits from some degree of gloss.</p> <p>MATT: least glossy finish while maintaining good clarity and colour enhancement and should be used to eliminate or minimise glare.</p>
Laminate Composition	<p>A lamination film is a post-printing material made of two parts: polyester and adhesive. "Construction" refers to the film and glue relationship. Construction is typically described by micron or mil thickness, eg. 5mil laminate will be described as a having a 3/2 construction (3 mil polyester / 2 mil adhesive). 1 mil = 25 microns</p> <p>It is the polyester that affects colour saturation and gives you rigidity. The greater the ratio of polyester to adhesive, the better the quality of film. A 5 mil laminate with a 3/2 construction is higher quality than a 5 mil laminate with a 1/4 construction.</p> <p>All laminates are not the same. Typically laminates that have thinner face films (economy construction) will be more problematic than those with a thicker polyester layer. Thinner face films will stretch and distort more easily creating wrinkles and other image defects.</p>

Premium Construction
75mic Polyester + 50mic Adhesive



Economy Construction
25mic Polyester + 100mic Adhesive



Lamination Production Notes

This information is intended to be a starting point. Each laminator has its own characteristics that may vary depending upon ambient conditions, laminator adjustments, age and condition of the laminator, etc. Temperature, pressure, speed and tension adjustments may need to be made to optimise laminate adhesion to the base material and to obtain flat, wrinkle-free prints.

- Make certain that ink in high saturation areas of the print has completely dried before laminating.
- Encapsulate prints intended for outdoor applications.
- Hot melt adhesives generally give greater adhesion. De-lamination could occur if heat and pressure settings are not correct for the media.
- Keep the laminator supplies, media, and all work areas clean. Any debris trapped under laminates cannot be removed.
- Static charges build on laminator and supply rolls. This might attract dust. A static elimination device may help.
- Use temperature tape to verify nip temperature before laminating prints, especially prior to beginning multiple quantities or oversized projects. Some laminators may have to be set higher in order for the nip to reach optimal temperature.
- Grommets may be added to laminated or vinyl prints to aid in display. To avoid tearing, strengthen the print prior to setting the grommets by adding a 2" triangle of heavy laminate between the grommet and the back of the print.
- If laminated prints curl up, the top laminate tension is too high. Likewise, if the print curls downward, the bottom laminate tension is too high.
- If laminated prints curl up, the top laminate tension is too high. Likewise, if the print curls downward, the bottom laminate tension is too high.
- Boat waking can occur when the nip pressure is too high or too low or pull tensions are too low.
- Improper cooling after lamination can result in wavy finishes or other defects.
- Uneven waves or wrinkles can indicate a misaligned roller. Do not attempt to adjust a laminator roller without proper instructions from the manufacturer.
- Silvering can occur if heat or pressure is too low, or speed is too high. This can also happen if there is too much moisture in the media prior to lamination. Heating or pre-drying before laminating the prints may help correct this problem.
- Refer to the Supplies Data Sheets section of this guide for instructions regarding lamination requirements for specific media.
- ALL 720 dpi PAPERS require higher temperature settings and slower speeds than 360 dpi papers to ensure acceptable laminate adhesion. EX: NIP temp @ 240°F and 1 FPM.

Glossary of Terms

A	
3-Colour black	Area of solid Cyan, Magenta, and Yellow combining to form a black.
Accelerated Light Testing	Equipment is used to expose materials to light, at elevated energy levels, more concentrated than the actual light source.
Adhesion	Bond between two surfaces. A substance capable of holding materials together by surface attachment
Adhesion, Initial	Force required to remove a pressure sensitive material from a substrate (Important: this force can only be measured under specific, standard conditions to obtain reliable and comparable results.)
Adhesion, Peel	Peel adhesion, measured 20 minutes after the self-adhesive material has been applied.
Adhesion, Ultimate	Peel adhesion, measured 24 hours after application of the material
Adhesive Permanent	Adhesive that provides permanent bond to a wide variety of surfaces
Adhesive Removable	Adhesive giving low ultimate adhesion to a variety of surfaces
Adhesive Repositionable	Adhesive that permits removal and re-positioning shortly after application, prior to development of ultimate adhesion.
Application	A method for creating a graphic for a specific purpose. This can include materials, printing, finishing and construction methods.
B	
Backlit	A print illuminated from behind. These prints may also be viewed from the front with the back lighting off.
Bleed	Amount an image extends past the desired size of a print. This extra image area allows for errors in sizing and positioning during finishing. External bleed is measure outside the final trim dimension of the print. An external bleed of 0.5" will create a print 1" larger than required. Internal bleeds is the amount an individual panel extends over a seam between panels. An internal bleed of 10mm will give 20mm overlap between adjacent panels
Boat-waking	During lamination, uneven tension can cause ripples in the prints. Boat waking is when ripples originating at the center of the print extend diagonally out towards the edges.
C	
Calendered PVC	PVC (poly vinyl chloride) sheet formed by means of system of cylinders, distributing and pressing the PVC into a sheet of the required caliper.
Caliper	Distance between the 2 surfaces of a material, measured in microns.
Cast Coated PVC	PVC sheet manufactured by coating PVC onto a web of coated paper. This technique allows the production of PVC sheeting with low caliper, high flexibility and improved dimensional stability.
Chemical Resistance	The resistance of a material to the deterioration effects resulting from exposure to chemicals under specified conditions
Cohesive Strength	The internal strength of an adhesive, often determined by the force required to split or separate it internally.
Conformability	Ability of a material to adjust itself to the contours of a surface.
Curl	Tendency of a paper or laminate to bend around the axis of one of its main directions.
Cyan, magenta, yellow	The subtractive (process) primaries

D

DPI	Dots per inch
Decal	Decals are laminated prints with some adhesive applied to the back.
Dimensional Stability	Ability of a material to retain its original dimensions when subjected to specific exposure conditions.
Dither	The process of distributing dots to create the appearance of a solid hue and tint. The dither patterns used in inkjet printing will determine the sharpness, colour, contrast, and saturation of a print.
Durability	The time period a graphic will retain an acceptable appearance for its intended use under the specific exposure conditions (eg: indoor, moderate = normal office environment with limited window exposure and outdoor, moderate = climate with mild temperature ranges, low humidity, and minimal ambient UV and pollution exposure).

E ---

Elongation	Increase in length of material brought on by extending it to breaking point.
Emulsion	A dispersion of fine particles or globule of a liquid normally incompatible
Encapsulate	When the top and bottom laminates extend past the edge of a print, they form a bond that seals out dirt and moisture. This aids in outdoor durability. Proper temperature and pressure required for an even, permanent seal.

F ---

Face Material	Any paper, film, fabric, etc. adhesive coated on the backside. In laminates, it is the material to display image.
Fading	The process of degradation of colour brilliancy.
Failure Rate	Actual number of prints or "Finishing Material" destroyed during the production process. The print provider can have a print failure without a "Finishing Material" failure. But a "Finishing Material" failure always results in a destroyed print.
Final trim	Final trim is the actual size of the finished print, usually as displayed.
Finish	Surface property of a material determined by its surface contour and gloss.
Finishing Material	Generic term representing any number of materials in post-print production for application assembly. An example of a "Finishing Material" would be banner vinyl used in the assembly of the application Indoor Vinyl Banner.
Fleet Markings	General term applied to decals (for promotion) or pressure sensitive applications designed and produced for customers having more than one-company owned vehicle for business use, delivery transport use, etc.

G ---

Gloss	Light-reflective property of a surface measured in gloss units.
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H ---

Haze	Property of transparent film that appears as a reduced look-through
Heat Resistance	The ability of a material to resist physical or chemical changes caused by exposure or elevated temperatures.
Hue	A colour's name

I ---

Ink Coverage	Ink coverage is the coverage at a particular point on the surface of the media (i.e., 0-400% ink) and varies throughout an image.
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J

Job Orientation Print Dimensions for width and height of a file as it is going to be printed. Height could also be referred to as length.

L

Laminate Any protective, transparent material applied to either side of a print. Available in many thicknesses, finishes, with anti-graffiti treatments and scratch resistance. Laminates with heat-activated adhesives are known as hot laminates. Pressure activated laminates are known as cold laminates.

Laminate bead When the top and bottom laminates extend past the edge of a print, they form a bond that seals out dirt and moisture. This aids in outdoor durability. Proper temperature and pressure is required for an even, permanent seal.

Lay-Flatness The ability of a self-adhesive laminate to remain flat under changing temperature / humidity conditions

Lightfast The ability to withstand a predetermined amount of light with minimal or acceptable change.

M

Migration Movement of one or more components from one material into another. (e.g. plasticiser from film to ink, plasticizer from film to adhesive, etc.)

Mottle Random blotchy irregular pattern in solid fill areas giving loss of density.

Mounting The process of adhering a digital print to a substrate using an adhesive, either on the back of the laminated print or coating the substrate.

N

Nip The gap between the heat or pressure rollers of a laminator.

Normal Observer Person whose visual acuity and colour perception fall within normal limits

O

Opacity The degree to which a material can prevent the transmission of light

Overlamine Typically a pressure sensitive (cold) laminate that is applied on top of a finished print (usually vinyl) to add durability, special finishes, increased thickness or other characteristic.

Over saturation Excessive amount of ink placed onto media causing image to bleed through or across the media.

P

Plasticiser Component of plastic materials that provide flexibility

R

Red, Green, Blue The additive (display) primaries

Referral The state in which a print is being handled and/or viewed

Reflective Colours that are seen after they bounce off an object's surface

Release The force required to separate a pressure sensitive laminate. This force varies with test conditions - peel speed, temperature and peel angle, etc.

Release Coat The coating applied to the backing paper, which enables the latter to separate readily from pressure sensitive adhesives.

Rough trim Prior to final trim, it may be necessary to trim the print to approximate size for ease in handling. When final trim is not known until at the display site, rough trim may be used.

S

Saturation	The relative colourfulness or chromaticity of a colour
Secondary Colour	The colour that results when two primaries are added or mixed together.
Shade	The result of adding black to a pure hue
Silvering	A problem occurring during lamination. It is seen as a silver sheen or discolouration in dark areas. The silvering is produced by very small bubbles in the adhesive layer of the laminate, usually indicating separation due to low pressure, low heat, or high speed.
Solvent Resistance	The resistance of a pressure sensitive material to the action of specific organic liquids.
Stiffness	The property of a material that enables it resist bending forces
Substrate	The surface to which a self-adhesive material is to be adhered.

T

Tack	The property of a pressure sensitive material that causes it to adhere to a surface under conditions of low pressure and short contact.
Tear Strength	Property measured by the force required to tear a specimen under specified test conditions.
Tensile Strength	The force required to break a material under specified test conditions.
Tint	The result of adding white to a pure hue
Translucent	Transmitting light in a diffuse manner so that the object beyond cannot be clearly distinguished, partly transparent
Transparency	The light transmission rate of a clear film
Transmitted	Colours that are seen through a transparent or translucent object
Trim	The final size of a finished graphic. Usually the final trim is the size of the print as it is displayed.

U

UV light	An invisible light radiation. This may change properties of paper, plastics or inks after prolonged exposure.
UV Stabilizer	A chemical compound which absorbs UV - radiation selectively, preventing or delaying a change in characteristics of a plastic material or adhesive.

V

Value	A colour's lightness, darkness, or brightness.
Voids	Small circular non-imaged areas with or without dark centers. Voids can be partially coloured with one or more colours.

W

Water fast/Water Resistant	Ability to withstand the effects of water with minimal or acceptable change.
Water Proof	The ability to be unaffected by water.
Weather-ability	The ability of a material to withstand the effects of exposure to weather conditions, without significant change in physical or chemical properties.
Weather Testing	Material is subjected to the actual environments that they need to be used in (accelerated weathering is not possible).
White, Black & Gray	Colours that have no hue, only value.
Worms	Wiggly coloured streaks in image. Can show in many ways. For example, could appear to look like trails of water droplets or a finger painting.
Wrinkle	Folds, wrinkles, or stretch marks in media.

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Xerox House
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