

DUPONT™

Tyvek®



Mask Bag, designed by Shou Tao, 陶桃, China



DuPont™ Tyvek® Graphics EMEA Printability Guide



Water-resistant



Paper-like



Lightweight



Tear-resistant



Recyclable*



Printable

**Tyvek® is made of HDPE, and products made of 100% Tyvek® material can be recycled at facilities that recycle flexible HDPE materials. Please check recycling facilities in your area to ensure they can recycle Tyvek®.*

DuPont™ Tyvek® Graphics EMEA Printability Guide

DuPont™ Tyvek® is a popular printing substrate due to its light weight, smooth surface, high dimensional stability, opacity, toughness and durability. Uncoated Tyvek® can be printed using most digital and commercial printing processes. Some digital presses and some aqueous ink jet printers require a special coating. Tyvek® can be printed either sheet or web-fed. Tyvek® can be printed the same way as paper, although some of its physical properties do require special attention. To achieve excellent print quality, both the designer and printer must understand the unique properties and characteristics of Tyvek®.

Tyvek® is made of continuous high-density polyethylene filaments. By using heat and pressure, these filaments are bonded into a base material for printing which turns out to be neither paper, cloth nor plastic film, but it integrates the advantages of those three materials.

Tyvek® material has a melting point of 135°C and is a water-resistant and non-absorbent material with superior dimensional stability, high strength, and a smooth matt surface. Most traditional printing technologies can be used for Tyvek® printing, as well as some digital printing. The following Tyvek® printing quick reference guidelines have been summarized based on our current knowledge and the relevant contents will be updated continuously.

Which printing technologies are suitable for Tyvek® printing?

1. Traditional printing

| Printing method | | Tyvek® hard structure | Tyvek® soft structure |
|------------------------------|---|-----------------------|-----------------------|
| Offset Lithographic Printing | - Traditional sheet-fed offset printing - UV sheet-fed offset printing - UV web-fed offset printing | Suitable | Suitable |
| Flexographic Printing | - Water-based - Solvent - UV | Suitable | Suitable |
| Rotogravure Printing | - Water-based - Solvent - UV | Suitable | Suitable |
| Screen Printing | | Suitable | Suitable |

For detailed operating procedures, please contact us: graphics@dupont.com

2. Digital printing

With the growing demand for personalized and short lead time for orders, digital printing is used more frequently for the printing of Tyvek® brand materials, especially for the HP Indigo machine. Since the fusing temperatures of laser printers commonly seen on the market are much higher than the melting point of Tyvek®, they are not suitable for Tyvek® printing. However, the ProC7100X, 9100X machines of the Ricoh series have already been demonstrated for Tyvek® printing (such as the printing of Tyvek® 1082D certificates) because their fixing temperatures can be adjusted to suit Tyvek® materials.

| Printing method | | Tyvek® hard structure | Tyvek® soft structure |
|---------------------------------------|--------------------------------------|--|-----------------------------------|
| HP Indigo | - Sheet-fed | Suitable | Unsuitable |
| | - Web-fed | Suitable (refer to next table) | Suitable (refer to next table) |
| Laser printing | - Conventional | Unsuitable | Unsuitable |
| | - Ricoh Pro C7100X and C9100X series | Frequently used on 1082D but was not subject of authenticated tests of the equipment | Unsuitable |
| Narrow web-fed label printing machine | - Water-based ink-jet printing | Unsuitable | Unsuitable |
| | - UV/LED ink-jet printing | Frequently used but was not subject of authenticated tests of the equipment | Not used |

HP Indigo suitability

| Tyvek® styles | HP Indigo web-fed (roll to roll) | | | HP Indigo sheet-fed (only for one-shot technology) | |
|---------------|----------------------------------|------------|------------|--|----------------|
| | 20000 | WS6xx0 | WS4xx0 | HP Indigo 7xxx | HP Indigo 5xxx |
| 1025D | not tested | Certified | Certified | failed authentication | |
| 1057D | not tested | Certified | Certified | Not certified but frequently used for racing numbers | |
| 1058D | not tested | Certified | Certified | not tested | not tested |
| 8740DL | not tested | Certified | Certified | Certified | Certified |
| 1073D | not tested | Certified | Certified | Certified | Certified |
| 1082D | Profiled | Certified | Certified | Certified | Certified |
| 4158D | not tested | Certified | Certified | not tested | not tested |
| 4173D | not tested | Certified | not tested | Certified | Certified |
| 1442R | Profiled | Profiled | not tested | Unsuitable | |
| 1473R | not tested | not tested | not tested | Unsuitable | |

Note : 'failed authentication' means that the authentication test was conducted but didn't meet the evaluation requirements for testing result, which was likely due to the specifications of the materials exceeding the limits of the equipment.

HP Indigo
Certified Media

3. Wide-format ink-jet printing

HP Latex 3rd generation, Canon CrystalPoint™, and most UV/Inkjet presses are suitable for direct printing on Tyvek®. Water-based, solvent, and eco-solvent ink jet presses do not print with acceptable quality on uncoated Tyvek®.

Wide-format ink-jet printer

| Printing method | | Tyvek® hard structure | Tyvek® soft structure |
|------------------------|---------------|-------------------------------|-------------------------------|
| Ink-jet printer | Water-based | Suitable on pre-coated Tyvek® | Suitable on pre-coated Tyvek® |
| | Solvent-based | Suitable on pre-coated Tyvek® | Suitable on pre-coated Tyvek® |
| UV/LED ink-jet printer | | Suitable | Suitable |

Note: if water-based ink-jet coating or (slightly) solvent ink-jet coating is pre-coated on the surface of Tyvek® materials, it is feasible to directly print with water-based ink-jet printers or (slightly) solvent ink-jet printers.

Canon suitability

| Tyvek® styles | Colorwave CrystalPoint™ | Colorado M series UV Gel |
|---------------|-------------------------|--------------------------|
| 1073D | Profiled | Profiled |
| 1082D | Profiled | Profiled |
| 1442R | Unsuitable | Profiled |
| 1473R | Unsuitable | Profiled |

HP Latex suitability

| Tyvek® styles | 300 and 500 series | 1500 and 3000 series |
|---------------|--------------------|----------------------|
| 1025D | Certified | Profiled |
| 1057D | Certified | Profiled |
| 1058D | Certified | Profiled |
| 1073D | Certified | Profiled |
| 1082D | Certified | Profiled |
| 1442R | Unsuitable | Unsuitable |
| 1473R | Unsuitable | Unsuitable |

For certification information, visit the website <http://www.hp.com/go/mediasolutionslocator> and search 'DuPont' in the HP PrintOS Media Locator. For information on all machines that have passed authentication for use with Tyvek® materials, click 'download' to enter the downloading page or consult DuPont sales and technical personnel.

Certified for
HP Indigo

Certified for
HP Latex Inks



Product safety information is available upon request. This information corresponds to our current knowledge on the subject. It is offered solely to provide possible suggestions for your own experiments. It is not intended, however, to substitute for any testing you may need to conduct to determine for yourself the suitability of our products for your particular purposes. This information may be subject to revision as new knowledge and experience becomes available. Since we cannot anticipate all variations in actual end-use conditions, DUPONT MAKES NO WARRANTIES AND ASSUMES NO LIABILITIES IN CONNECTION WITH ANY USE OF THIS INFORMATION. Nothing in this publication is to be considered as a license to operate under or a recommendation. For any specific questions regarding the handling of solid waste, for items made of Tyvek®, please contact either your supplier or send an e-mail to: eu-info@dupont.com

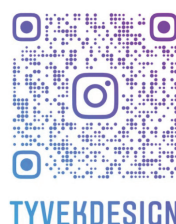
For further information, technical assistance or samples, please contact DuPont or your local distributor.

DuPont de Nemours (Luxembourg) SARL
2, rue Général Patton | L-5326 Contern | Luxembourg

www.graphics.dupont.co.uk

graphics@dupont.com

Tel 0080038766838/ 001 5712092351



TYVEKDESIGN



Appendix - Additional printing guidelines

Ink adhesion and corona treatment

Tyvek® styles for graphics are corona treated to improve adhesion of inks, adhesives and coatings. Unlike polyethylene film and other synthetics, Tyvek® does not lose the effectiveness of corona treatment with time. If uncertain whether Tyvek® is corona treated, test the surface energy with commercially available dyne pens or perform a simple “Water Drop” Test. Corona treated Tyvek® has a surface energy of 38-42 dynes; Tyvek® without corona treatment has surface energy of about 30 dynes. Tyvek® styles with a B suffix (ex: 1059B) are untreated and are used primarily for applications where food contact is required.

Printing on the smooth or rough side or both sides

Tyvek® has a smooth side and a rough side. When printing one-sided or where print clarity or full print coverage is most important, print on the smooth side. On hard structure Tyvek®, the difference is minor, but can usually be felt and can be seen easily under a low-power magnifying glass. Soft structure has a linen (smooth) and a rib (rough) side. The linen side is preferred for printing because of better ink hold-out and better surface stability.

Longer drying time may be required for conventional ink in offset and screen printing

Tyvek® is not as absorbent as paper, so inks take longer to dry on Tyvek®. Allow up to two days to complete the printing process because extra drying time-up to 24 hours per side - may be needed to allow the first side to dry before printing the second side. The drying time depends on room conditions, as well as the amount and type of ink used.

Temperature and tension guidelines

Tyvek® is more elastic than paper and should be handled under the lowest tension possible to avoid distortion and misregistration. Under tension, such as in printing or coating operations, we recommend temperature shall be no higher than 79°C to avoid deformation of Tyvek®. Heat transfer and dye sublimation printing are not recommended because the temperatures used to transfer the dyes exceed the melting point of Tyvek® which is 135°C.

Reducing static on Tyvek®

Tyvek® styles for graphics are treated with an antistatic agent to reduce static during sheet handling operations; these include any style with a D or R suffix. Antistatic agents function best at 50% RH or more. Below 20% RH, antistatic agents lose their effectiveness and sheet feeding will become noticeably difficult. The above-mentioned styles have also been treated by corona discharge to improve adhesion of inks, coatings and adhesives. To further reduce static, use copper tinsel to connect Tyvek® to ground and install active static eliminator bars and devices.

Printing tips for Tyvek® having no antistatic or corona treatment

Styles of Tyvek® without corona or antistatic treatment - B styles - can be printed using standard commercial printing equipment and suitable inks; however, special steps must be taken to obtain optimum printing results. When printing on Tyvek® B styles, we recommend testing before proceeding with production operations. When processing B styles, static charge can build on the roll and discharge to equipment or people. Static may also cause cut sheets to stick together.

