

**Product:** Tyvek 1073D

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**Category:** Folio Papers - Synthetic

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## **Tyvek**

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**Classification:** Synthetic Specialty Grade

**Mill:** DuPont, USA. ISO 9002

**Environmental:** Fully recyclable (there are no additives or fillers)

**Features :**

- Strength
- Can be printed
- Lightweight
- Water resistant
- Dimensional stability
- Lint free
- High opacity
- Less abrasive
- Flexible
- Well suited to offset, lithography, letterpress, screen process, ink-jet process

**Benefits:**

- Tyvek ® will not rip or tear
- Yields superior strength at very light weight
- Won't disintegrate in contact with water, equally as strong wet or dry
- Won't stretch or shrink between machine passes
- Reduces the instance of printing hickies, ideal for sensitive processes such as diskette sleeves
- Security for envelope contents, less print show through
- Knives, dies and punches last longer
- Will not crease, crack or split

**Physical Properties:**

- 100% high density polyethylene fibre, spunbound with heat and pressure
- No binders, sizes or fillers added
- No linting
- Six times stronger than Kraft
- Ten times stronger than paper
- Water resistant
- No grain direction
- Dimensional stability - sheet diameter changes less than 0.01% between 0-100% RH at constant temperature
- Biologically inert
- Inert to most organic and inorganic chemicals
- High calliper variation
- Compressible

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Archival Properties:	Will last up to 30 years if not exposed to ultra violet light
Applications:	Maps and instruction manuals, baggage tags, nursery tags, flags and banners, food labels, steel wire tags, fun run labels, chemical labels, brick and building material labels, envelopes
Finishes:& Tints:	White, Sheets and Reels
Alternative Stocks:	Polyart and Teslin
Competitive Grades:	Unique product with no competitors

### Tyvek

### Additional Information

Typical Properties:

	Style 1057D	Style 1058D	Style 1073D	Style 1082D	Test Method
	55	54.3	75	105	ASSTM S 3376
Basis weight(g/sqm)	53-57	51-58	72-79	101-111	ISO 536
Thickness (mm)	0.16	0.16	0.19	0.26	DIN 53104"
Tensile MD N/25.4 cm	130	150	210	290	ISO 534
Tensile XD N/25.4 cm	160	175	250	360	ASTM D 1682
Tear Elmendorf MD N	5.5	3.2	6.6	7	DIN 53112"
Tear Elmendorf XD N	5.5	3.9	6	7	ASTM D 1682
Opacity (%)	95.4	90	95.5	97	DIN 53113"
Corona	Yes	Yes	Yes	Yes	ISO 1974
Antistat	Yes	Yes	Yes	Yes	ASTM D 1922
					SDO 1974"
					DIN 53146

Typical Properties  
of Type 10 Tyvek :

	1057D	1073B	1073D	1085D	Test Method
Basis weight(g/sqm)	54	75	75	108	ASTM D3776
Thickness (mm)	145	185	193	259	ASTM
+/- Sigma Range	76-213	107-264	112-274	165-353	D1777
StripTensile MD N/cm	56	80	87	129	ASTM
CD N/cm	62	88	87	129	
Elongation MD %	18	20	19	22	D1682(1)
CD %	23	25	24	26	
Work to MD Nm	1.9	3	2.7	4.3	ASTM
Break CD Nm	2.7	3.6	3.3	5.2	
Tear, Elmendorf MD N	3	3.7	4.4	5.4	D1682(1)
CD N	3.1	3.8	4.2	5.8	
Opacity Col. Quest %	90	93	94	97	ASTM
Porosity, Gurley Hill, sec	21	22	24	42	D1682(1)
Internal Bons. N/cm	0.79	0.88	0.74	0.86	ASTM
Water Resistance Hydrostatic Head cm				160	D1424
<b>Treatment</b>					ASTM D726-84
Corona	Yes	Yes	No	Yes	ASTM D2724(2)
Antista	Yes	Yes	No	Yes	AATCC 127

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### Converting Banner Tips:

DuPont TYVEK® is composed of 100% high density polyethylene fibre. It is a tough, durable, tear-resistant material that is unaffected by water. TYVEK® retains its flexibility to -73°C (-100°F) but being a thermoplastic material it melts at 135°C (275°F).

TYVEK® can be converted in much the same way as paper or plastic films and on the same equipment. If you understand the properties of TYVEK®, you will find converting to be much easier.

All styles of TYVEK® with a "D" or a "R" suffix are antistated and permanently corona treated.

TYVEK® will stretch up to 30% before breaking. To minimise distortion or neck down during roll fed converting, keep tension less than 1.4 N/cm (0.75 pounds/inch.) A floppy web is recommended. This is particularly true when die cutting TYVEK® business forms with rotary punched sprocket holes.

### **Slitting, Sheeting, Cutting**

Because TYVEK® fibres are very strong, each must be completely severed; hangers will not break off. Knives, dies and punches must be set to close tolerances. A sharp, slightly rounded edge gives longer service than a pointed edge for crush cutting, but a sharp edge is preferred for other slitting methods.

### **Rotary Die Punching**

Because soft steel male/female rotary dies dull quickly when Set to the close tolerances required to punch TYVEK® cleanly, the use of rotary dies made of hardened tool steel or tungsten carbide is recommended. A list of manufacturers of these dies for TYVEK® is available from your TYVEK® Technical Specialist.

### **Die Cutting**

TYVEK® can be die-cut using either steel rule, male/female or closed dies. TYVEK® fibres must be completely cut and dies must be in good condition with sharp, nick-free edges. Dull dies cause edges to curl. When using closed dies, the use of a side cutter with internal relief is recommended. Deaerate and keep lift height below 7.6 cm (3 inches) when die cutting to avoid oversizing to blanks.

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### **Punching**

TYVEK® can be punched on tag, letterpress and rotary line-hole equipment. Best results are obtained for sharp, well registered and closely fit punches. Punches may be either smooth or serrated and cut best if ground concave on the ends. A soft self-honing male punch in a hardened female die is recommended.

### **Folding**

TYVEK® will take a dead fold and can be folded on conventional bindery folders. An increase in roller and spring tension will produce sharper creases. Due to the inherent slippery surface of TYVEK®, soft, rubber-covered rollers will aid feeding.

### **Perforating**

To make clean tearing perforations a 10:1 cut to reserve ratio is recommended, i.e. 8.0 mm cut: 0,8 mm reserve (5/16in.: 1/32in.). Tear initiation can be assured by positioning a cut at the edge of the sheet.

### **Embossing**

TYVEK® can be embossed with either high or low pressure equipment. Cold embossing does not significantly reduce the strength of TYVEK®. It does, however, reduce opacity. Embossing cylinders used for TYVEK® usually are very shallow, having a depth of only 0.13-0.65 mm (5-25 mils.). A Shore "D" hardness of 70-80 for the rubber back-up cylinder is preferred.

### **Foil stamping**

This is readily accomplished on TYVEK® due to its thermoplastic nature. A variety of foils is available from suppliers for label and book cover applications. A foil that will transfer cleanly to TYVEK® between 135-160°C (275-325°F) should be chosen. Large, solid foil-stamped areas tend to pucker and distort TYVEK® and should be avoided.

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#### **Coating**

When coating or laminating TYVEK®, the web temperature should not exceed 79°C (175°F).

#### **Dyeing**

Conventional textile dyeing processes do not impart permanent colour to TYVEK®. For this reason, Type 14/16 TYVEK® is usually printed by the flexographic or gravure process using either solvent or water base inks. Sublistatic printing of TYVEK® is not recommended because of the high temperatures used.

#### **Laminating**

TYVEK® can be extrusion, adhesive and calender laminated. Extruded, branched polyethylene is an excellent adhesive for laminating foil and film to TYVEK®. Polyurethane adhesives can be used to adhere a variety of films and fabrics to TYVEK®. When laminating TYVEK® to paper or board, it is important to completely cover TYVEK® with adhesive to prevent bubble formation.

#### **Heat Sealing/Dielectric Sealing/Ultrasonic Sealing**

Heat sealing TYVEK® to itself or other films is usually accomplished by applying a heat seal coating such as branched polyethylene to one of the materials. High seal strength can be achieved using hot-bar or impulse techniques. TYVEK® cannot be dielectrically sealed under ordinary conditions because it is non-polar. Recent developments in ultrasonic sealing have demonstrated seals almost equivalent to heat seals.

#### **Glueing**

Natural product adhesives based on dextrin, casein or animal by-products can be used to adhere TYVEK® to itself and a variety of paper materials. Water based synthetic lattices such as the ethylene/vinyl acetate adhesives form fibre tearing bonds with TYVEK®. Hot melt polyamide adhesives are available which form good bonds to TYVEK® with a variety of materials. Acrylic pressure sensitive adhesives are commonly used with a release liner.

#### **Sewing**

TYVEK® can be sewn on conventional sewing machines. Best results are obtained with machines equipped with

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puller or drop-feed. Smooth, rubber covered rolls should be used rather than knurled metal rolls which tend to leave impressions on TYVEK®.

#### Stitching

When stitching the Type 10 styles of TYVEK®, 2-3 stitches/cm (4-5/in.) and the smallest needle practical should be used to avoid postage stamp tears. On soft type 14/16 TYVEK®, it is recommended to sew rough side to rough side.

#### Coating

Coatings are used to colour, improve print fidelity, add gloss or mask the fibre pattern of TYVEK®. Air-knife coating is preferred for aqueous coating because it applies a uniform thickness of coating on TYVEK®. Usually an increase in binder content is needed to achieve acceptable coating adhesion to TYVEK®. The air knife also produces a very smooth surface which is ideal for printing. Gravure coating is preferred for solvent-based systems, particularly where deep coloration is required.

#### TYVEK® FLEXO TIPS

TYVEK® is 100% high density polyethylene (HDPE). It has been corona treated on both sides to improve ink adhesion and it is coated with an antistatic agent facilitate converting. Unlike with other materials these treatments are permanent.

- Water base or alcohol/pigmented polyamide inks are preferred for printing TYVEK®. Optimum adhesion is attained with alcohol/polyamide inks, however, nitro-cellulose lacquers can be added to produce a harder ink film. Aniline dye inks are not recommended for printing TYVEK®.
- Photopolymer plates with a Durometer hardness of 50° shore A or less are preferred for printing fine type, reverse type and bar codes. It is recommended to print on the smooth side.
- Soft rubber plates with a Durometer hardness of 40° shore A or less are preferred for printing large solids.

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- Mount all plates with 0.5 mm of sticky back, closed cell foam tape. This will help compensate for the inherent thickness variation in TYVEK®.
- DuPont CYREL® plates and foam tapes are widely used for flexo printing.
- Medium density bar codes and 4 pt.Type can be printed using photopolymer plates and the press set-up described above.
- Multi-colour process printing is best accomplished with 48 lines/cm screens.
- Print at low tension - A floppy web going into and out of the printing nip is required. Web tension should not exceed 1.4 N/cm to prevent sheet distortion and print misregister in multicolour work.
- Drying temperature must not exceed 80°C (176°F).TYVEK® is a thermoplastic material with a melting point of 135 °C(275°F).

For more information on printing TYVEK® contact your TYVEK® supplier or DuPont



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### TYVEK® OFFSET TIPS:

TYVEK® is 100% high-density polyethylene (HDPE). It has been corona treated on both sides to improve ink adhesion and it is coated with an antistatic agent to facilitate sheet handling. Unlike with other materials these treatments are permanent.

- Use low solvent content inks - TYVEK® is unaffected by water, but hydrocarbon solvents found in most offset inks will swell and distort it (for a list of these solvents please refer to the "solvents" under properties). It is important to use inks containing less than 3% volatile solvent. These inks are usually made from dry pigment.
- Most ink suppliers have offset inks for TYVEK®.
- Inks made from permanent pigments are recommended for printing TYVEK®.
- Add more impression - Usually TYVEK® will require about 0.08 - 0.10 mm additional impression compared to a sheet of paper of equivalent thickness, because it is more compressible.
- Reduce level of dampening solution - TYVEK® does not absorb water as readily as paper, for this reason, the press should be run with less dampening solution. If the printing is dull or washed out, reduce the amount of dampening solution, verify its pH (ideal is 7). Don't increase the ink volume.
- Print with the minimum ink film thickness - This will minimise dot distortion, sheet distortion and the appearance of fibre swirl and will also reduce ink drying time.
- Offset inks dry more slowly on TYVEK® than on paper. When doing full coverage multi colour printing, keep the pile height below 50 cm. Winding the sheets will also accelerate drying.
- TYVEK® is unaffected by alcohol and alcohol substitute dampening solution additives.

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- Either side of TYVEK® can be printed - Generally, the smooth side, with a slight downward curl at the edges is preferred. However, for two-side printing with heavy coverage, print the smooth side first with the least coverage and back it up on the rough side with the heavier coverage.

- DuPont-Howson plates are widely used for offset printing.

For more information on printing TYVEK®, contact your TYVEK® supplier or DuPont.