



# Application Notes

## An Explanation of Woven PE and Polybanner Materials

### Industry Confusion

Polybanner and Woven PE are regularly confused in conversation due to the fact that they seem to be made of the same base material. It is important to understand both materials; what applications they are intended for, and the strengths and limitations of both. In fact, they have very little in common and serve different purposes. With a little background, it should be easy to distinguish between these two popular substrates.

### Applications and Attributes

Woven PE	Polybanner
Paper billboard replacement.	Lightweight, short-term banners.
Polyethylene	Polypropylene
Structurally strong woven, lightweight & recyclable. Outdoor Use.	Tear-resistant, smooth surface. Indoor Use.

The table above simplifies the intended applications and the attributes of both materials. Polybanner is a mature product that has been used extensively by screen print producers for banners and event signage. Woven PE has recently been introduced to serve as a lightweight, single sheet alternative to paper billboards where PVC flex-face is too costly or heavy. A secondary bonus to Woven PE is the fact that it is recyclable, making it a potential "green" alternative to vinyl. This document is intended to clarify the confusion often associated with the two materials.

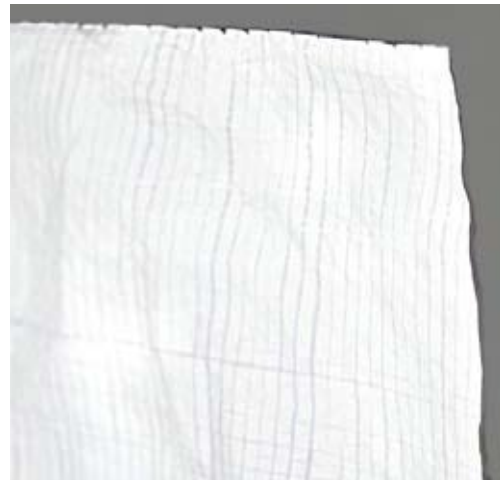
### Woven PE

Woven PE comes from the tarp industry. It has been used primarily to cover products in shipment such as skids of lumber and machinery. Other products made from PE include tote bags, livestock feed bags, pool cover, pond liners and vapor barriers.

Woven PE has a distinctive woven pattern with each strip being between 1/8 and 3/8 of an inch wide. The material can be gray or white on the back face for opacity, eliminating the need to remove prior paper postings. PE has less than 1/3rd of the weight of traditional PVC. Intended for outdoor use, PE has an expected life of six months. It's primary feature is that it eliminates the need for pasting and allows for a seamless, single-sheet installation that can be done with clips or other stretch methods. This allows an

alternative to the pasted paper 30-sheet posters without the need for heavy, costly flexface PVC sheets.

PE is suitable for outdoor use but is generally not used in indoor and close view applications as the weave and surface characteristics are undesirable. As a billboard material, this is acceptable and it's strength and the fact that it is lightweight make it ideal. UV curable inks are almost always used, as solvent inks are not generally suitable.



Woven PE sheet showing typical weave pattern.

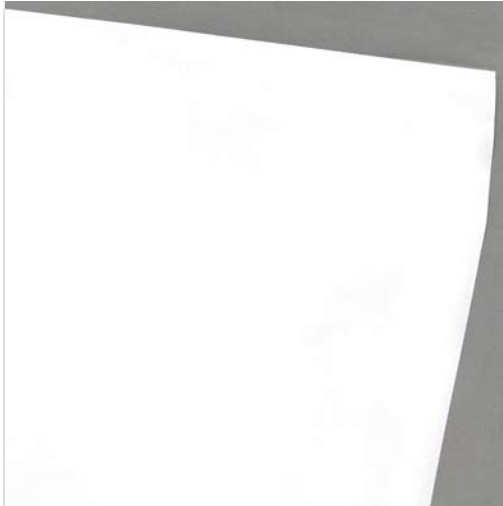


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## Polybanner

This material has been used for some time as an alternative to banner vinyls where a lightweight, smooth substrate was desired in indoor banner applications. The material is made of polypropylene and has a satin finish without any visible scrim or pattern. It has very good tear resistance and is a good choice for poster prints, photo enlargements, tradeshow displays and indoor banners.

This material tends to be very reactive to heat. It is an unsupported thin plastic sheet and is prone to expansion and contraction at temperatures above 140°F/60°C. Additionally, it is stretchy and can cause problems as it moves through material transport systems. Too much tension will cause it to move in an inch-worm like way, causing image quality issues.



*Polybanner sheet showing typical smooth, satin finish.*

The tear resistance of polybanner allows it to be hemmed and grommeted similarly to PVC banner materials. The lightweight aspect makes it ideal for indoor beverage and event banners that require reduced shipping costs and ease of installation. Long used with screen print inks, Polybanner is best described as the material used for lawn and garden fertilizer bags. Very difficult to tear open, smooth and glossy finish. There are coated versions available for aqueous and solvent inks available for large-and wide-format printers. UV curable inks introduce heat issues but the inks tend to have very good adhesion to the material if the proper cure level can be applied without causing expansion problems.

## Different Materials, Similar Names

The two materials are often confused mainly because of the word poly they both share as part of their names. Polyethylene is a thermoplastic produced by direct polymerization of ethylene at high temperatures and pressures. It is often referred to simply as PE. Once made into the construction known as Woven PE, it is strong and stable. While Woven PE is more resistant to the effects of heat while printing, material inconsistencies in the weave can result in transport issues through the printer system.

Polypropylene is a thermoplastic similar to PE but with a higher molecular weight resulting from the polymerization of propylene gas and is the lightest of the thermoplastics. It is smooth, flat and strong but can be affected easily by normal amounts of heat generated by UV lamp systems. When used with UV curable inks it is important to realize that testing will be necessary to determine if it performs at the required throughput and adhesion levels required for the intended application.

## The Right Material for The Job

Woven PE and Polybanner are both popular materials with many compelling characteristics in their appropriate applications. As with any material, they also have some limitations that must be kept in mind when selecting them for a particular application. The table below summarizes some of the target applications and guidelines to keep in mind for successful utilization of these materials

Woven PE	Polybanner
<p><b>Target Applications</b></p> <p>Billboards, Construction Wraps</p>	<p><b>Target Applications</b></p> <p>Indoor Banners and Event Signage</p>
<p><b>Usage Guidelines</b></p> <p>Review adhesion with desired ink set</p>	<p><b>Usage Guidelines</b></p> <p>Test for heat issues at required throughput</p>



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