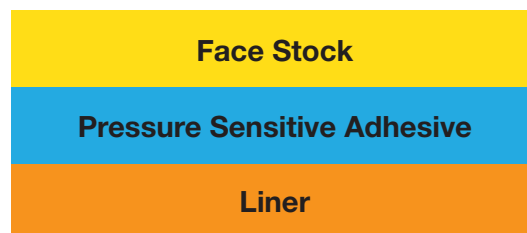


General Formulations is a major producer of pressure sensitive media for the printing industry. Glues and adhesives have been discovered in archeological excavations of primitive cultures. However, the commercial pressure sensitive tape industry is relatively young, being less than 100 years old. In 1925 a 3M research assistant, Mr. Richard Drew, developed pressure sensitive masking tape to improve efficiency in two tone automotive painting. At that time the state of the art was to paint one color, dry and cure the paint, apply glue to the first color than paper over the glue, dry that combination then paint the second color. If you were lucky the paper and glue may come off the first color without damage but that process was unpredictable with many paint jobs being ruined. 3M developed a masking tape based on a pressure sensitive adhesive that could be applied to the dried and cured first paint color, painted with the second color and then removed without damaging the first color. Masking tape resulted in improved efficiency and quality of two tone automotive painting and led to development of additional pressure sensitive tapes such as clear cellophane tape for gift wrapping. Pressure sensitive tapes and media have evolved continually to the point where there is a product for about every conceivable use that requires some type of fastening.

#### **JUST EXACTLY WHAT IS PRESSURE SENSITIVE MEDIA?**

Pressure sensitive media is a printable face stock that has a pressure sensitive adhesive on the opposite side of the face stock which is to be printed. In order to process through a printing press, there is a liner against the other side of the adhesive to protect the adhesive and face stock from sticking to the printing press and protect the adhesive until its intended application. The following illustration is typical for pressure sensitive graphic media. Certain face stocks may require a topcoating to offer adhesion to common printing inks.



#### **TYPICAL PRESSURE SENSITIVE PRINT MEDIA**

#### **WHAT IS A PRESSURE SENSITIVE ADHESIVE?**

By definition a pressure sensitive adhesive is dry soft permanently tacky material, viscoelastic polymer, that holds two surfaces together by surface contact. No water, solvent, or heat is required to activate adhesive bond. Only slight external pressure is required to accelerate wet out of the adhesive to the intended surface. In pressure sensitive print media, one side of the adhesive is bonded to the face stock during manufacture. The second side of the pressure sensitive adhesive layer is protected by the liner until application. At that time slight pressure is used to wet out the adherent surface.

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## WHAT IS A VISCOELASTIC POLYMER?

Viscoelastic is derived from two words, visco from viscosity and elastic. While a pressure sensitive adhesive is a solid polymer it exhibits the property of molecular wet out when in contact with a solid surface similar to liquid water. An elastic polymer will exhibit strain when a stress is applied. It will stretch. When the stress is removed, the polymer will return to its original state. You can think of an elastic polymer as being able to stretch and contract when stress is applied or removed from the polymer. A pressure sensitive adhesive is a viscoelastic polymer because it has both properties. Somewhat like a rubber band. A functional pressure sensitive adhesive must have the correct flow or wet out from the high viscosity component to adhere to the substrate but have enough elasticity to keep flow under control and maintain adhesive bulk.

## WHAT IS A POLYMER?

A polymer is the linking of monomers in a chemical reaction that usually involves heat, time and a catalyst. Think of a multi-link chain as a polymer and each individual link as the monomers. Add a specific amount of monomers to a common solvent, add heat over a specific time period and possibly a specific catalyst and the monomers will chemically react to link together forming a polymer. By selecting the blend of monomers the resultant polymer will be permanent tacky at room temperature resulting in a pressure sensitive polymer.

## WHAT POLYMERS ARE COMMONLY USED AS PRESSURE SENSITIVE ADHESIVES?

Acrylics, various “rubber” based and silicone polymers comprise most commercially available pressure sensitive adhesives. For a further discussion of these types of pressure sensitive adhesives refer to General Formulations Technical Article on Pressure Sensitive Adhesives in the Technical Articles section of the website. [LINK](#)

## GRAPHIC MEDIA FACE STOCK

The second component of pressure sensitive media is the face stock. Just about anything can be used as a face stock as long as it will accept ink. Paper, synthetic paper, plastic films, and metals are some common face stocks. A face stock is chosen depending on a combination of factors:

- Is the face stock compatible with the ink chemistry and printing process?
  - Some face stocks require coating with an ink receptive layer before ink will bond to its surface.
- Is the face stock compatible with the pressure sensitive adhesive for the intended application?
- Will the face stock be resistant to the environmental exposure conditions encountered during its application period?
- Is the face stock economically positioned to effectively compete in its intended application?

The face stock is the most visible component of a pressure sensitive graphic. It provides the background color and gloss to your graphic. During post printing processing, a face stock may need to be easily die cut into individual graphics. Therefore, the face stock is a critical component of a pressure sensitive graphic. For a detailed discussion on the various face stocks used to produce pressure sensitive graphics refer to General Formulations Technical Article on Face Stocks in the Technical Articles section of the website. [LINK](#)

## GRAPHIC MEDIA LINERS

The final component of pressure sensitive media is the liner. Liners act as protection to the pressure sensitive adhesive until the time of application. At that point the liner is removed and disposed, exposing the adhesive allowing it to bond to its intended surface. However, before it is removed and thrown away, the liner may have to perform a variety of functions. Liners may have to assure the media stays flat during printing and processing. In some instances, the liner must offer a hard consistent caliper base for precise die cutting, be it rotary or clam shell cutting. Finally, in some applications the liner may have to offer some degree of printability. Some graphics

require application instructions or a retailer may offer some type of promotion on the backside of the liner. Most liners are paper or a paper lamination that is compatible with most printing presses and finishing processes. Some plastic films also are used as liners for pressure sensitive media. After the correct liner base is defined a release coating must be applied to produce a functional graphic release liner. Silicone polymers are the primary release coating. For additional information on release liners refer to General Formulations Technical Article on Release Liners in the Technical Articles section of the website. [LINK](#)

This brief review shows that pressure sensitive graphic media is a complex technical product. It is a combination of hydrocarbon polymers ultimately sourced from oil or natural gas. There are natural components such as paper with the ultimate source being trees. Pigments are mined

from the earth. Before a raw material is incorporated into a pressure sensitive graphic it may have gone through many

manufacturing steps. Therefore, what may look simple is highly technical and complex and containing many variables that can affect your printing, processing and application. To help select the correct pressure sensitive graphic media for your application, contact your General Formulations Customer Service Representative at 800 253-3664 or through the website at [www.generalformulations.com](http://www.generalformulations.com). Your customer service representative is available under Contact Us/ Customer Service Team.

