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## Pressure-Sensitive Mounting

Last month, I wrote about wet glues and spray adhesives. This month we'll study pressure-sensitives, and the pun in the title is no joke. I have soap-boxed about time, temperature, pressure, and moisture (TTPM) for years, stressing that these four elements apply to *every* form of mounting, and will confirm it once again.

Often we think of pressure-sensitive adhesives as the cold alternative that is quick, clean, easy, and permanent. Yet, this cold alternative to dry mounting is only quick in initial contact application, since the completed bond takes 24 hours to occur. Yes, it is clean and easy to use, but will be only be as permanent as the correct application techniques (TTPM) used.

Adhesive permanence is directly related to whether the adhesive makes a *molecular bond* or a *mechanical bond* between the layers. Adhesives with molecular attraction do not soak in and never really harden, making them weak like water, not strong like cement. Meanwhile, starches and white glues “squish” into and between fibers and harden when dry, making them a unified part of the whole mounting. This is an example of a mechanical bond and is why Chinese scrolls have stood the test of time.

### Basic Information

A pressure-sensitive adhesive (PSA or P-S)

is a permanently tacky substance that bonds to an untreated surface at room temperature with the application of slight pressure. They are meant to always retain their tack and this, in turn, is why they have lower bonds than heat-set adhesives. PSAs do not require any open time or solvent evaporation in preparation for bonding as do wet and spray adhesives. They are dry, synthetic adhesives that are clean, easy to use, odorless, and require no heat or solvents. These adhesives often have release papers applied to protect them from bonding until required to do so.

By definition, P-S adhesives differ from every other category of adhesive. They are predominantly “thermoplastics that soften under heat and are soluble in select solvents.” They are available in tape form on a paper, plastic, or similar carrier or backing, and are not and never can be “archival.” Since pressure-sensitives used in framing will always leave an adhesive residue behind when removed, they must *never* be used for preservation mounting of quality art.

### Pressure-Sensitive Tapes

Unlike tapes that require heat or moisture to activate the adhesive, P-S tapes (and adhesives) bond by mechanical (manual) activation and mutual attraction. As framers, we utilize pressure-sensitive tapes

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everyday. Transfer tape (called ATG tape) is a P-S adhesive film floated onto a single paper liner. The adhesive is applied to the surface and the liner is discarded, leaving only the film tape. It is applied with a dispenser (an ATG gun) or manually and requires aggressive burnishing to fully activate.

Pressure-sensitive transparent tapes (ie: Scotch Brand tape) are adhesive applied to a permanent acrylic carrier that remains intact with the adhesive even after application. They are available as both permanent and removable, and are also frequently used in framing. Permanent tapes hold v-grooved and inlaid mats together, while removable tapes are most often used for temporary masking during mat decoration. Burnishing encourages bonding longevity.

Cellophane tapes, masking tapes, and others often have harmful components (such as rubber) in the adhesive or carrier that can damage artwork and collectibles. The adhesives are not removable and they may stain, yellow, dry out, and/or leave adhesive residue behind. (For additional information on tapes, see "Framing Tape Products" *PFM*, February 1994).

## Adhesive Activation and Technique

It has been said that when an ATG tape is applied to the back of a matboard with an ATG gun, only 20 to 25% of the adhesive's capability is activated by simply pressing two mats together. In order for an ATG tape to be fully activated, it needs to be burnished after application. This is tough to do between two window mats. This is why a thin line of wet glue between two mats is

considered a more permanent bond that will not fail over time.

When a heavily textured paper or substrate is to be mounted, a double layer of P-S film may be used if it has no carrier to increase the adhesive between the layers. Remember, though, that the adhesion is created by the activation (by pressure) of the adhesive thickness between the layers. If only 20% of the P-S adhesive is activated due to lack of weight or pressure during bonding, additional adhesive thickness may not be the answer. It would be better to activate the remaining 80% of the inactive layer first. This can be achieved through use of a cold vacuum frame or aggressive burnishing by hand when initially applied by a squeegee or rubber roller.



*Photo 1: PMA (3M) Mounting film adhesive has only one release liner and no carrier, making this P-S film perfect for self-shaping. Two layers of film may be applied when bonding rough textures to make certain of full adhesive coverage.*

## Permanent Pressure-Sensitives

PSAs may be either *permanent* or *removable* and are available in low, medium, and high tack varieties. In this case, permanent means impossible to remove without destruction of the substrate or mounting, such as a mailing label or poster mounting. Coated or inked papers are the most difficult to

adhere (such as RC photographs) and require a softer, more aggressive pressure-sensitive adhesive to bond well. The difference between application temperature and use temperature affect bonding permanence, such as when something mounted at room temperature is to be displayed outside.

High moisture content also makes pressure-sensitive adhesion difficult. Moisture is a physical barrier to adhe-

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sion and long-term bonding. A coldness to the touch is often an indicator of moisture content in boards, so learn to feel what you are touching when selecting boards. If you only have cold mounting facilities, it is nearly impossible to dry out moist materials prior to mounting for a truly permanent bond.

Just as removable pressure-sensitives may not always “remove,” permanent pressure-sensitives may not always be permanent. Never select a pressure-sensitive product without knowing the exhibition conditions (where the project is to be displayed and used). A permanent, high tack pressure-sensitive applied at room temperature may fail at freezing temperatures if it is placed outside or in an excessively humid bathroom.

## Removable Pressure-Sensitives

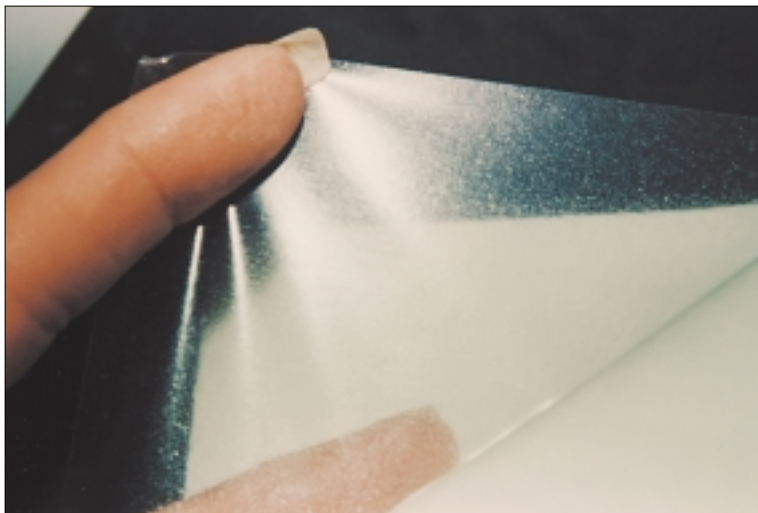
Removable PSAs may be removed without harming the substrate in any way or leaving adhesive residue, like a Post It note. However, this is subject to usage conditions and application techniques. A case in point: a “Hello” tag with a light tack removable P-S adhesive left a damaging adhesive residue on the lapel of one of my friend’s beautiful suede jackets.

Ease of removability depends on the selected substrate, the length of time the adhesive contacts the substrate, and the temperature during bonding. A pressure-sensitive that is removable in one application could become permanent in another (as on the suede jacket). If surfaces are dirty, oily, or too textured, it will not bond as well as it would to a smooth, clean surface. And the warmer the materials, the more aggressive the adhesive becomes. If a removable adhesive is left too long in con-

tact without removal, it may leave adhesive residue behind when finally removed. Such is the case with repositionable heat-set laminates and P-S films with carriers.

## High, Medium, and Low Tack Pressure-Sensitives

*High tack* PSA is aggressive and the most difficult to apply by hand since it often has no repositioning potential. It is often applied with roller machines and is generally geared to the commercial market. *Medium tack* PSA is often used in framing. It may be repositionable until burnished in place. *Low tack* PSA is not suitable for the longevity of framing demands. It may be found as a temporary positioning tack used in preparation for other bonding, as with HA adhesives.



*Photo 2: This film adhesive has a polyester carrier with the adhesive applied to either side with two paper release liners. It does not self-shape, but is repositionable.*

## P-S Products

There are a number of commercial pressure-sensitive products on the market, available as adhesive sheets, rolls, and pre-adhesed boards with release paper coverings. Let’s examine these, broken down into film and applied boards.

First, there are P-S films, available with and without carriers, both with positive applications. 3M Positionable Mounting Adhesive (PMA) is a sheet of 100% adhesive with release paper on only one side (see Photo 1). Since it has no center carrier, the adhesive is rather delicate and easily pulls apart by handling. It is the perfect P-S, capable of self-shaping for odd shaped projects, small prints, montage, and collage applications. Self-shaping is the process of the adhesive separating to the shape of the mounted artwork without requiring any additional cutting or trimming.

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Another pressure-sensitive film with single-sided liner is Neschen Gudy 870 Mounting Adhesive. It is a high tack, nonrepositionable film of polyacrylic ester in a water dispersion that is considered permanent for photos and posters. It is acid- and solvent-free and was designed for heat sensitive items that require long term bonding. Available ½", 12", and 24" wide, it has passed the Photo Activity Test (PAT). Although it is not harmful, it will never be archival.

Crescent Perfect Mount Self-Adhesive is another pressure-sensitive film, and has two release liners. This film consists of a very thin polymer (polyester) carrier sheet coated on both sides with pressure-sensitive adhesive (see Photo 2).

This allows the sheet to be handled more aggressively without pulling apart, though it will stick to your fingers and could wrinkle. Self-shaping is not possible because of the supporting carrier sheet; it requires trimming in order to be shaped. It is neutral pH with a chemically inert adhesive that trims cleanly with a blade without pulling. It is repositionable until burished in place and requires weighting for 24 hours while creating a maximum bond that is considered permanent. It is designed to be used for inexpensive poster prints, newspaper clippings, and craft projects. Since it has two liners, it can not be rolled and is available in flat sheets from 11"x14" to 32"x40".

Films are also developed on wide rolls for large format production used in conjunction with roller/laminators such as Seal PrintMount adhesives and Hot Press Double Sided and Self Healing Mount Films.

Another type of P-S adhesive—pressure-sensitive boards—have the film adhesive already applied to a mount or foam board with a protective release paper liner that is removed before mounting. They are available as low tack repositionable and more permanent “peel and

## **PRESSURE-SENSITIVE ELEMENTS OF MOUNTING**

### **TIME**

Maximum bond strength is not achieved until the adhesive has set for 24 hours.

### **TEMPERATURE**

Though not a dominant element, the warmer the materials, the more aggressive the bond. After initial bonding, extremes of heat and cold can affect the long-term bond.

### **PRESSURE**

A weight or vacuum is required to supply the pressure to create a permanent bond.

### **MOISTURE**

Damp materials won't bond together regardless of mounting methods. Make certain all materials are dry.

stick” versions in medium and high tack. Although some are considered acid-free, always remember that permanently attaching anything to a backing board is *never* archival! It is not the adhesive that will damage the artwork that makes it nonarchival, it is the adhesive residue if removed. Check specifications for products from manufacturers including 3M, Crescent (Perfect Mount Boards), Hartman (Hartac), Savage (Nucor), Hot Press, Hunt/Bienfang (Quick Stick), and International Paper (Gator).

Remember, many companies offer both low and high tack versions of their P-S adhesives on both foam and mounting boards. Low tack is generally repositionable while the

high tack will often immediately bond. In order for an adhesive to be repositionable, something must be sacrificed. In this case, it is high tack permanence.

## **Special Equipment and Techniques**

No major equipment purchase is necessary for pressure-sensitive mounting, though roller machines or cold vacuum frames are recommended for greater bonding permanence. The 20" Schild C-35 PMA Applicator will handle substrates up to ¼" thick. Heat presses may be used to accelerate the initial bond, though this may defeat the purpose of a cold application.

Large scale production operations may invest in a Hot Press Roller/Laminator or Seal Image Laminator designed for use with wide, high tack pressure-sensitives, but this machine is generally reserved for use in the reprographics and large format digital markets, advertising, and photo labs. In many cases, these applications are not meant to be long term permanent applications but only to look nice for the duration of use.

Manual applications are most common with a release liner (removed from the board or film) used as a slip

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sheet, and a squeegee, hand rubber brayer, or roller as the initial pressure activator. If using a board, remove the liner fully, and realign it to cover all but the top few inches to square up the image to the board. Then slip the liner from beneath the print as you lightly smooth the print into position with a gloved hand. Cover with the liner, smooth side against the image, and bur-nish firmly in position. Place under a weight for 24 hours before framing.

## **P-S Wrap Up**

As the above descriptions of PSAs have unfolded, perhaps you noticed the discussions and mentions of a 24 hour period of *time* for bonding, *temperature* suggestions of warmer is better than cooler, weighting under *pressure* in a vacuum frame, roller or glass, and the fact that *moisture* inhibits permanent from becoming permanent. Funny how those TTPM elements show up yet again, as with all mounting techniques (see Diagram 1).

Next month I'll complete this overview of basic mounting options with "Dry Mounting." Then maybe we'll be ready for some fun...or a quiz. Until then, mind your TTPM and beware of April Fools. ■

*Note: For additional reading see "Tapes" by Greg Perkins, PFM, May 1993; "Float Mounting With Pressure-Sensitives" by C. Paschke, PFM, October 1996; and specific individual products from major manufacturers. Excerpts and reference material also taken from The Mounting and Laminating Handbook, 1997.*