

Beva 371 Film, Testing, and Application

From dry mount adhesives to preservation film, who knew?

Yes, another article on the ever-disappearing materials from our industry, and the substrates it is mounted to. All of the Film 4000 I located is gone in less than a year, and since there is no sign of any version of a Film 4000 replacement, research needed to be done on other alternatives of adhesive to fill the void.

Aside from wet/dry mounting with EVA (ethylene vinyl acetate), or pressure-sensitive mounting with Gudy 870, there has been a transparent permanent PSA film hiding in plain sight: Beva 371 Film.

History and Development

BASF (Baden Aniline and Soda Factory) was established in 1865 in Mannheim, Germany, and at the time produced dyes, as well as the necessary inorganic chemicals, and today is the largest chemical producer in the world with subsidiaries and ventures in over 80 countries. When Gustav A. Berger developed BEVA 371 [solution] in 1970, he was obtaining some of his ingredients [for Beva] from BASF, and he realized that some of the components may become unavailable in the future.

In the 1990's, Berger identified new components that could replace any of the 5 existing compounds in BEVA 371 when he needed



them, so when Laropal K80 (formerly Ketone N) was discontinued by BASF in 2008, aldehyde ketone resin was chosen to replace it, maintaining adhesive strength and elasticity. The reformulated adhesive was developed between 2009-2021 and was designated BEVA 371b. It was slightly more yellow than the original formula because the new resin was more yellow, but when Laropal K80 went out of production, the 2021 replacement Laropal A81 eliminated the previous yellow with its clear/white color and Beva 371a was born.

An open edition Wild Apple print was test mounted in a 210-X mechanical press at 150°F for 15 seconds, 1 minute, and 175°F for 3/16" foam-board resulting in excellent tear strength bond.

Liquid to Film

Originally only available as a gallon liquid, Beva 371 solution has been converted as a pure 371 solution into film form for easy workability without the use of flammable solvents, and in applications where liquid Beva



Chris A. Paschke, owner of Designs Ink in Tehachapi, CA, is a professional picture framer with over four decades of experience. She is an artist, a National Conference educator, has authored numerous magazine series, including *The Essence of Design*, *Design Concepts*, and *Digital Directions* for PFM, and has four self-published books on mounting. She currently writes the *Mastering Mounting* column for PFM and is a contributing writer to *The Artist's Magazine*, *The Pastel Journal*, and *Watercolor Artist Magazine*. She was honored with the PPFA Award of Distinction for Leadership 2008, the Vivian Kistler Recognition for Innovation Award 2010, and the PMA Distinguished Service Award 2012.



Beva film is sandwiched as opaque white 4mil silicone coated release paper, adhesive attached to a sheet of 1.5mil Mylar release film (Release paper + Adhesive + Mylar release film).

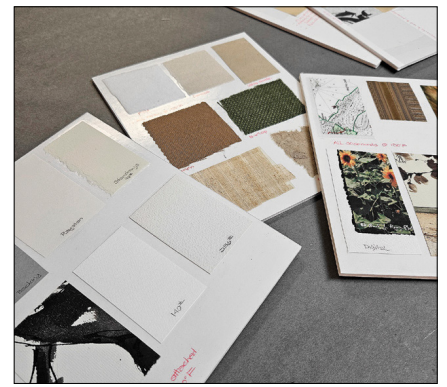
may not be suitable. Since its development as a film, it may soon be the only heat-activated film available. It is transparent, smooth, non-toxic, non-flammable, does not trap air; and heat activates with a tacking iron, house iron (at polyester temperature setting), vacuum table, or dry mount press, and is most frequently used for relining deteriorating or torn canvases with a new structural substrate.

An MSDS states that the adhe-

sive is a solid polymer film composed of four major elements: Ethylene Vinyl Acetate (EVA) Copolymers Cyclohexanone resins, Phthalate Ester of Hydroabietyl Alcohol, and Paraffin; all of which ensure flexibility, good adhesion, tackifiers for initial stickiness, and lower bonding temperature. these elements allow for it to bond well on assorted paper textures and weights, fabric, canvas, textiles, wood, metal, plastic, and boards making it well suited for relining paintings, mending tears, bookbinding, textile and leather conservation, and more.

Composition

It comes in 27" and 54" wide rolls at 1 mil and 2.5 mils. The roll appears to be composed of two materials rolled together, one of which contains the Beva 371 Film, the other a release liner. The white paper is a silicone



(L to R) Panel 1 – 40# Lineco, 30# Ragston, 90# Stonehenge, 140# and 256# rough watercolor; Panel 2 – Felt, Raw canvas, Ultra Suede, Linen, Burlap, Papyrus, Amate Bark paper; Panel 3 – Encapsulated map, 1ply embossed accent strip, Xerox digital print, dye sub digital canvas, Epson digital canvas, digital photo. All perfect in 15 seconds at 150F.

coated paper; this is the release layer. The other clear sheet is a polyester (Mylar) film, one side of which has been coated with the Beva 371 adhesive. The side of the clear sheet facing the release paper is the adhesive side, which may be verified as slightly tacky and scrapes with a fingernail.

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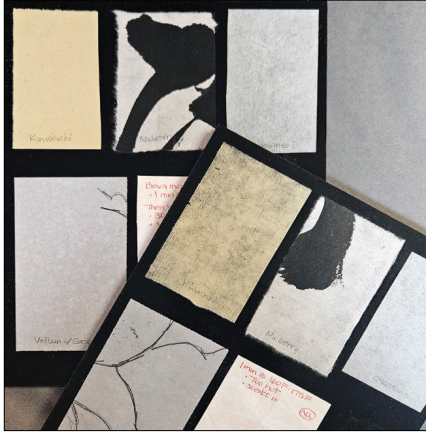
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Once mounted it is removable using hexane or acetone, or by heat, though adhesive residue will remain.

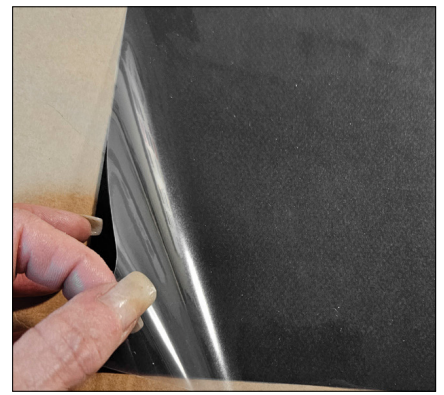
Test, Test, Test

Beva is perfect for relining delicate posters and torn canvases, but wait,



Kinwashi, mulberry, glassine, tracing vellum with graphite on back, Tyvek, Unryu dyed black, Unryu thick Chiri/Brown all bonded perfectly at 150F for 30 seconds with no visible saturation damage. But at 160F - 175F for 1 minute there was visible saturation of all the porous Asian papers.

there is more. The first step was to determine all the basics for this adhesive including what it will mount to tear strength, as well as basic time and temperature tolerances, whether it could be used in dry mount presses, and if it adapts to creative applications. It was basically tested using a mechanical press set at 150°F for 15 seconds and 1 minute, and 175°F for 1 minute, using a folded single-sided commercial release paper envelope and no release board. On to what will bond and at what time and temperature. Assorted papers, decorative papers, fabrics, digitals, photos, and encapsulated charts were tested, and—though small—remarkably they ALL mounted at 150°F in 30 seconds. Even the very thin, sheer Asian kinwashi and mulberry papers, polyester encapsulate, glassine, vellum with graphite on the back, and Tyvek all mounted perfectly.



Once cool, peel the Mylar liner from the mounted adhesive.

Since part of the reason we need a clear dry mount film is to apply it to any desired substrate to prevent ghosting, it needed to be tested on black foamboard. At 150°F it was fine, but at a hotter 165°F - 175°F for 30 seconds all the decorative Asian papers showed soaking through. Since no testing was done in the 4060 Vacu-Seal, allowing for the draw time will add time to the process, while the temperature should still stay between

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This shows the layout of the Pin-striped Tiered mat of 2 black 4-ply ragboards with 3 sheets of Canson red paper between them.

150-175°F. Time and temperature will need to be tested in your unit before using on a real project.

Basic Beva Instructions

Usually, it is recommended to apply to the substrate first, but this may change with the application. With the Beva intact, cut the film to size. Separate the clear layer and lay the tacky side onto the substrate. Using a tacking iron set at 150°F or a house

iron set at Polyester, iron the adhesive to the substrate, across top and center down, then out to all edges. Once cooled, peel the Mylar, leaving the adhesive on the surface. Place the material to be mounted on top of the adhesive you have just prepared. Use the silicone coated white paper as a release paper to protect the art. Iron 150°F heat to melt the adhesive between the two layers to adhere. The final mount may be achieved by either hand iron or dry mount press (it will take longer to heat up all layers to bonding temperature to activate).

The basic mounting rule of “increase time or temperature, but not both” holds true here too. Beva melts at 150°F but the window is 150°F-185°F. If there are numerous layers or an 8-ply substrate, often the temperature is better for final bond at 175°F, with 2 minutes in a



This shows the gloss of the premounted Beva that was hand ironed to each layer for a Surface Tiered (Precious Metal Gold and Black Canson) atop Pin-striped Tiered core of 4-ply cream ragmat (top and bottom) with 2 sheets of Black Canson between.

mechanical press. Beva Film easily mounts oversized works because it is premounted to one surface (substrate) and once cooled the Mylar liner is removed. Non-tacky adhesive allows for ease of alignment.

Pin-Striped and Surface-Tiered Mats

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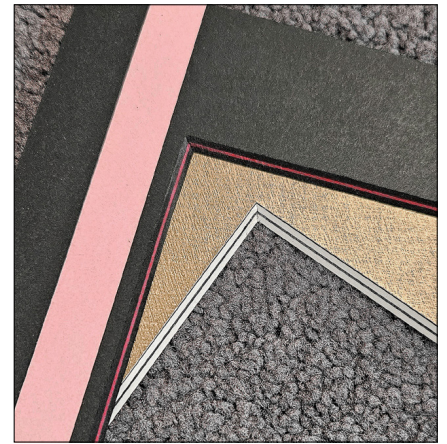
hesive, so Beva needed to be tested in that venue also. Tiered matting is very profitable but has the option of becoming time intensive when requiring a wet/dry mount with dry mounting making it quick and easy with size and bond—everything at once. Both the mechanical press version for each layer and final bond, as well as manual hand house iron for each individual layer then bonding the final as a unit in the press were tested. Interestingly, once all layers were sized, it seemed simpler and quicker to hand iron the Beva to the back of each separate sheet then mount the unit at 175°F for 2 minutes.

The first sample is a pin-striped, tiered mat consists of 2 black 4-ply ragboards with 3 sheets of Canson red paper between them. The Beva was applied to the backs of the top mat and three single sheets of paper then

to the back mat. The second sample is a surface-tiered pin-stripe with Precious Metal Gold and Black Canson atop a 4-ply cream ragmat, 2 more sheets of Black Canson between that and the back 4-ply cream rag. All layers were hand premounted, cooled, aligned, then placed in a release envelope into the mechanical press at 175°F for 2 minutes.

As framers, we never throw anything away, especially this Beva. Every scrap could also become the perfect bonding adhesive for a surface decoration. The Canson pink strip was premounted to the Beva then trimmed to size and hand ironed to the surface of the black pin-striped mat. These are great front room samplers to illustrate what you are pitching tiered mats to a prospective client.

The price difference between Beva and Film 4000 is significant, but



Completed Tiered mat samples 1 and 2. These are great front room samplers to illustrate what you are pitching to a prospective client when they have no idea what you mean by a tiered mat.

the composition and applications are much improved. Anytime a product comes along that fills a void and can make a job more predictable and dependable, it should be considered. As with any service offered, the charge should always reflect the hard costs by increasing the mounting charges to cover the upgraded adhesive. **PFM**

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