Vacuum Laminating/Membrane Pressing KYDEX® Sheet

INTRODUCTION

Laminating processes where unprimed KYDEX® sheet is heated until it is formable and then a strong vacuum draws it down onto a substrate coated with adhesive. Ideal for contoured forms with rounded corners or curved parts. Vacuum laminating only uses vacuum to help the KYDEX® sheet wrap around the edges. Membrane pressing adds positive pressure to the surface of it after the vacuum cycle has begun to help force it into the profile and around the bottom edge of the part.

HOW DOES IT WORK?

A design is routed into the substrate (MDF, wood, etc.) and a heat-activated adhesive is applied to the surface. These parts are placed on the vacuum table and KYDEX® sheet is placed over the parts; clamps on the edges of the table hold it so that vacuum can be pulled. The table slides into the press and is heated, the KYDEX® sheet becomes formable, and the adhesive is activated. Then vacuum from below and pressure from above, when membrane pressing, pushes/pulls it around the contoured part. The table and parts then begin to cool. Minutes later, the table slides out of the press and the parts are ready for trimming.

WHAT GRADES OF KYDEX® SHEET WORK BEST FOR MEMBRANE PRESSING?

Thicknesses from 0.71mm (0.028”) to 1.02mm (0.040”) are recommended in the vacuum laminating/membrane pressing process. Thicknesses up to 12.80mm (0.500”) are available for other application methods.

KYDEX® XD: Extreme durability (XD), superior impact, membrane pressable thermoplastic 3D laminate with integral color from 0.76mm-1.02mm (0.030”-0.040”) thickness, offers Class 1/A rating.

KYDEX® XD03: Extreme durability (XD), superior impact, membrane pressable thermoplastic 3D laminate with integral pearlescent color from 0.76mm-1.02mm (0.030”-0.040”) thickness, offers Class 1/A rating.

KYDEX® XDWG: High impact, membrane pressable thermoplastic 3D laminate with wood grain design in 0.91mm (0.036”) thickness only, offers Class 1/A rating.

PROCESSING

Most membrane presses have a preheat step, then a pressure/vacuum step and a cooling step. Each machine has different optimum settings, but a good starting point is below:

	Pre-Blowing Time	Preheating Time	Pressing Time	Cooling Time	Top Heater Temperature	Bottom Heater Temperature	Pressure
0.76mm (0.030”)	1 second	70-80 seconds	65-75 seconds	80-90 seconds	130°C - 150°C (266°F - 302°F)	82°C - 88°C (180°F - 190°F)	2 Bars (29 psi)
1.02mm (0.040”)	1 second	120-140 seconds	85-95 seconds	110 seconds	130°C - 150°C (266°F - 302°F)	82°C - 88°C (180°F - 190°F)	2 Bars (29 psi)

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MINIMUM RADIUS

The minimum radius using 0.571mm (0.028") KYDEX® sheet would be about 3.18mm (0.125") at a19.05mm (0.750") draw. Any smaller and tear-out may occur. In general, the thicker the sheet stock the better chance of wrapping tight radiuses with deeper draws.

BOWING

On long and large parts, when the KYDEX® sheet shrinks as it cools, it can pull of the edges of the substrate, causing the substrate to bow. This is a common occurrence with most laminating foils. However, there are some steps that can be taken to combat warping or bowing:

1. Get a stronger or higher density substrate
2. Purchase a pre-bowed substrate, and press the KYDEX® sheet so that its bowing tendency is in the opposite direction.
3. Use thinner gauge material. Product minimum thicknesses are listed above.
4. Some parts will allow for structural support; i.e. fastening the part at the ends can correct bowing effects.

- Helmibond 854 with catalyst #552, (Helmitin Adhesives) US: 800.634.8761 / Canada: 877.823.2624 www.helmitinadhesives.com
- JOWAPUR 151 00, (Jowat Adhesives) USA: 800.322.4583 // UK: Ltd. +44 1785 716565 // AG Germany: 49 (0)5231 749-0 www.jowat.com
- Bostic 7132R/Boscodur 24T, (Bostic) 414.774.2250 // UK Ltd: 44 1785 257 755 // GmbH: 0 (54) 25/8 01-0 // S.A. France (33) 1 47 96 94 65 / www.bostik.com
- Daubond 6429, (Daubert Chemical) USA 800.688.0459 / (Outside US: +1.708.496.7350) / www.daubertchemical.com
- RK-4000-B, (H.B. Fuller)USA: 888.423.8553 // UK: 00800 385 53711 / www.hbfuller.com
- Vy-Lok 1011 with hardener IS205, (National Starch and Chemical USA: 800.797.4992 // UK: 44 1753 533494 www.nationaladh.com

Additionally, many PVC adhesives normally work well with KYDEX® sheet.

MEMBRANE PRESS MANUFACTURERS

- Buerkle Process Technologies GmbH: Tel: 49 7441 58 0 / www.buerkle-gmbh.de
- Italpresse Engineering SPA: USA: 888.743.5805 // Italy: 39 035 681122 / www.italpresse.com
- Wemhoener Presses, Germany Tel: 49 5221 77020 / www.wemhoener.de
- Friz Kaschiertechnik GmbH: Germany Tel: 49 7134 5050 / www.friz.de
- ORMA MACCHINE SPA: Italy Tel: 39 035 3640111 / www.ormamacchine.it
- Midwest Group One: USA: 612.721.5347 / www.midwestgroupone.com
- Euro Mercury Vacuum Presses: Ireland Tel: 00 353 85 7039544 / www.euro-mercury-presses.ie
- Shaw-Almex: USA: 404.294.0574 / www.almex-online.com
- Midwest Group One: USA: 612.721.5347 / www.midwestgroupone.com / Greco and Orma distributor
- Stiles Equipment: USA: 616.698.7500 / www.stilesmachinery.com / Wemhoener and Friz Distributor

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