KYDEX THERMOPLASTICS

Bonding KYDEX® Sheet

For information applicable to KYDEX® FST please refer to 300 series technical briefs.

TB - 150-A

Introduction

Due to its excellent chemical resistance, KYDEX® sheet can be more difficult to cement than other plastics. Herein we discuss how to cement KYDEX® sheet to itself and other plastics, Metals, and Wood. Strong bonds can be obtained for most applications using the methods shown below. KYDEX® sheet can also be joined to itself or to other materials using mechanical fasteners in place of adhesives.

Bonding KYDEX® Sheet to itself, or other plastics

Solvent Cementing:

When bonding KYDEX® thermoplastic sheet to itself, excellent joints and adhesion can be obtained using solvents in one of the following ways:

The best joints can be obtained using a viscous solvent cement consisting of about 10% KYDEX® sheet shavings or sawdust dissolved in a 50/50 mixture of tetrahydrofuran (THF) and methylethylketone (MEK). The KYDEX® sheet shavings should be dissolved in the straight THF first, before adding the appropriate amount of MEK. Both of these solvents are available from lab supply companies such as Fisher Scientific (www.fishersci.com) Ashland Chemicals (www.sigmaaldrich.com), or other chemical distributors.

Without the KYDEX® sheet shavings, a relatively fast-acting capillary adhesive can be made by using only the 50/50 THF and MEK mixture. THF works well at 100%, but it tends to flash off too quickly resulting in a poor joint. The addition of MEK slows down the evaporation rate and affords greater time to work with the joint.

Adhesives:

In addition to chemical solvents, good bonds (both KYDEX® sheet to it self and KYDEX® sheet to other materials) can be obtained from various commercially available adhesives. Some examples are:

Cyanoacrylate adhesives (e.g. "Super Glue"), such as Henkel's S1000 Power Series (contact Henkel in the US at 1.800.934.9401 or on the web at www.henkel.com, yield very high joint strength for bonding KYDEX® sheet to itself or to other materials. They are especially suitable for smaller areas of application where a very fast cure is desired.

THF based adhesives by IPS work extremely well for KYDEX® sheet to KYDEX® sheet applications. Any of the following IPS Weld-On adhesives can be used: #4052, #4007, and #1007. For more information on these products, please contact IPS in the United States at 1.800.421.2677, or on the web at www.ipscorp.com. Tangit manufactured by Henkel, and HAKU 2091 manufactured by Chemische Werke Kluthe GmbH. Chemische Werke Kluthe GmbH, on the web at www.kluthe.de/kluthe, are other acceptable products. These adhesives also work well for KYDEX® sheet to PVC and KYDEX® sheet to ABS applications.

Urethane based adhesives are available in easy-to-use two-part cartridge dispensers and result in good bonds. One such example is Ciba's Uralane 5774 adhesive. Ciba can be reached in the US by calling 1.818.247.6210, in Europe by calling 44.1223.832.121 or on the web at www.cibasc.com.

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Adhesives, Continued:

Acrylic based adhesives such as Devcon's 'Plastic Welder ' or 'Plastic Welder II' can be used to form very strong bonds with KYDEX® sheet. Both of the 'Welder' products are 2-part adhesives, which are available in cartridges. The Welders produce a strong bond, which cures in about 15 minutes; the adhesive is white in colour. You may order the 'Welder' products from Devcon in the US by calling 508.777.1100, in Europe by calling 44.1.933.675.299 or on the web at www.devcon.com.

Adhesive Engineering & Supply offers "Adhesive 310B" in black which is comparable to Plastic Welder. They can be reached in the US by calling 1.800.888.4583, or on the web at www.stick-it.com.

Most hardware stores carry an adhesive for PVC pipe. This type of adhesive usually works well with KYDEX® sheet.

Bonding KYDEX® Sheet to Metals

Preparation for Bonding:

For best bonding results, the substrates MUST be free from dirt, grease, and dust. To clean the surfaces wipe with a solvent such as isopropyl alcohol before you apply the adhesive. Remember that the bonding process works best if done in a temperature controlled environment of approximately 18° - 24°C (65° - 75° F).

Recommended Adhesives	In the US	On the Web
S1000 Power Series, Sicomet 63 (Henkel)	1.800.934.9401	www.henkel.com
Uralane 5774 (Ciba)	1.818.247.6210	www.cibasc.com
Hybond J9238A (Pierce & Stevens)	1.716.856.4910	www.piercestevens.com
Lord 406/19 & 661/6 (Lord)	1.800.458.0434	www.lordadhesives.com
Devcon Plastic Welders I & II (Devcon)	1.800.933.8266	www.devcon.com
JDC 1132 Rubber-based foam tape	1.800.804.7435	www.JDCinc.com
Arlon 101 foam tape (Arlon)	1.800.854.0361	www.arlon-std.com

Please Note:

For bonding KYDEX® sheet to aluminum, all of the above listed adhesives may be used. When bonding KYDEX® sheet to Cold Rolled Steel, stainless steel or other grades of steel, only the S1000 Power Series or Hybond J9238A should be used.

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Using Cyanoacrylate Adhesives:
The S1000 Power Series and the Sicomet 63 adhesives are cyanoacrylates and are especially suitable for smaller areas of application. When using these adhesives, be sure to join your substrates immediately after applying the adhesive since they have a very fast cure time.

Using Foam Tapes:
For application methods and cure times of the foam tape adhesives, JDC 1132 and Arlon 101, please reference their respective manufacturer's technical data sheets.

Using Urethane Adhesives:
Uralane 5774 is a two part urethane adhesive. Please reference the manufacturer's technical briefs for recommended ratios and application methods.

Bonding KYDEX® Sheet to Wood

For best bonding results, free the substrates from dirt, dust, and grease. Wipe the surface of the KYDEX® sheet with a solvent such as isopropyl alcohol. Remember that the bonding process works best if done in a temperature controlled environment of about 18° - 24°C (65° - 75°F).

Please Note:
If a latex primer is applied to the wood before applying the adhesive, it will decrease the amount of adhesive that absorbs into the wood when the first coat is applied. The latex primer is not mandatory for good adhesion.

Using Water Based Contact Adhesives (3M Fastbond 30):
Apply two coats of adhesive to the wood, allowing the first coat to dry thoroughly before applying the second coat.

Apply one coat to the KYDEX® sheet.
- Adhesive should be dry and not feel tacky when you are joining the substrates together. SEKISUI SPI recommends a minimum of 45 minutes before adhering the substrates.

After adhesive dries, three hours remain to complete the job.
- The longer you wait (up to four hours) the stronger the initial bond will be.

Apply pressure to make good contact between the substrates. For hand lay-up, the Crain #333 high-pressure roller is recommended. You can purchase the Crain roller at www.craintools.com
- Contact adhesives bond immediately upon contact - use slip-sheets to prevent accidental bonding.

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Bonding KYDEX® Sheet to Wood

Recommended Adhesives	In the US	On the Web
3M Fastbond 30, 3M 2262	.651.736.0315	www.3m.com
Henkel #52-3056	1.800.934.9401	www.henkel.com
Ashland Chemical Isogrip Moisture Cured Urethane	614.889.3625	www.ashchem.com
Super Tek XT-2000 Mastic Adhesive	718.278.7900	www.super-tek.com
National Casein PVC-E (EVA base)	609.829.1880	www.nationalcasein.com
Rohm & Haas M670 and M672 Moisture Cured Urethane	815.337.5217	www.rohmhaas.com

Using Mastic Adhesives (XT-2000):

Apply the adhesive to the wood surface only; cover 100% of the surface uniformly, using notched trowel;

- Insufficient adhesive is the cause of most problems.

Allow adhesive to set up according to instructions on the adhesive container label.

Join the substrates, applying pressure to ensure good contact.

Using Solvent Based Contact Adhesives (3M 2262):
Apply a uniform coat of adhesive to both the wood and the KYDEX® sheet

Allow adhesive to dry until it is tacky but does not transfer to the knuckle when touched (about five minutes, depending upon temperature and humidity)

Complete the bond within 20 minutes using firm pressure to ensure good contact

For best results with the other adhesives listed above, please refer to the manufacturer's directions.

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