

Practical Solutions to Sticky Problems

Why use adhesives when nails will do? Without adhesives, the stress that builds up in structural members concentrates around nails or screws. If you use adhesives, the stress spreads throughout the material. You'll also need adhesives to bond two dissimilar materials, but picking the right one is tricky because dissimilar materials have different rates of expansion and contraction (think of joining glass and wood, for example).

Most small contractors use all-purpose "construction adhesive," picked up from the lumberyard for most on-site adhesive jobs. This is supplemented by a gallon of yellow glue that rolls around in the back of the truck. But all-purpose adhesives only scratch the surface of modern "stickum" technology. You can find adhesives that will give you just the right holding power for a loose tile, a subfloor, crawl space insulation, or a number of other construction needs.

To find out which adhesives contractors used, we sent out questionnaires to 40 readers. We also talked with techni-

bonding agent into the tiniest nooks and crannies of the material (see "How Glues Work"). The adhesive uses volume and leverage to hold the pieces together. You have to be sure to apply enough glue so that you don't "starve" the glue joint, or you won't get a good bond. You'll also need pressure from nails, screws, or clamps until the bond set up.

Subfloor to joists. "Creep," another name for slow deformation over time, is a big issue in structural applications. If the joint creeps, the glue isn't doing its job. Brian River, a U.S. Forest Products research technician, cautions that off-the-shelf white blue creeps under structural loads, even with a good bond. Therefore, it should never be used in structural applications, says River.

Another concern with white glue is that it becomes brittle as it ages. A brittle adhesive won't have the longevity needed for good long-term performance.

The American Plywood Association (APA) publishes a long list of adhesives that have been lab- and field-tested for use on the APA Glued Floor System. This is the only industry list that includes performance testing under "field conditions." (For a copy of the list, write APA, Box 11700, Tacoma, WA 98411.) These adhesives also perform well for glued-up headers and beams.

Several contractors we surveyed had already found their way to one of the APA-approved adhesives. "Sonneborn 400," "Elmer's Subfloor & Construction Adhesive," "DAP 4000 Subfloor & Plywood Adhesive," and B.F. Goodrich's "Professional Subfloor & Construction Adhesive" scored high in our survey.

Frozen or wet lumber. Damp wood or cold wood presents a tough gluing challenge because most adhesives won't stick to it. But when you're building in winter, the lumber pile is often wet and frozen. Try "DAP 4000 Subfloor & Panel Adhesive." It's designed to work at lower temperatures and to form a secure, structural bond.

Treated lumber. Better quality construction adhesives will generally perform satisfactorily on treated lumber. Miracle Adhesives Company says its "SFA-66 Sub-floor and Construction Adhesive" will work with wet or treated lumber. H.B. Fuller also makes "Sturdi Bond" for hot/humid or cold/wet conditions and for treated lumber. Contech's "PL500" works with CCA- or ACA-treated wood and resists deterioration in sunlight.

Walls and Ceilings

Using adhesives on walls and ceilings gives greater rigidity to the building, and if you use adhesives instead of nails, you can eliminate nail pops, although a few nails are cheap insurance.

Drywall manufacturers recommend three types of adhesives. One is a modified contact adhesive that you apply down the framing members. You press the drywall against it then pull the drywall back. The solvents flash off and dissipate, and after five minutes, you can reposition the drywall. If you use a modified contact cement you can eliminate most of your nailing, but you'll get a noseful of solvent.

High-quality panel adhesives require fasteners at the top and bottom plates



Marylee MacDonald

Structural jobs call for strong bonds. You can eliminate much of the nailing and use wider spacing between ceiling joists if you use the right panel adhesive.

With a little homework, you can select the right specialty adhesive for almost any construction problem

by Jim Cavanaugh & Marylee MacDonald

cal staff in adhesives companies and industry associations. We've distilled this information to help you pick the best adhesives for your jobs.

Structural Adhesives

Structural adhesives are formulated to work with structured components and panel materials. With many, you can reduce nailing and increase the distance between framing members. If you have attic temperatures over 120°F for Arctic cold, you'll have to narrow down your list to those that perform well in temperature extremes. A structural adhesive must establish an effective bond under job conditions, and it should last the lifetime of the building.

Most structural adhesives infuse a

until the adhesive sets up. With many, you can eliminate nailing in the field if you put temporary bracing in the middle of the panel until the bond forms. The pressure on the panel ensures good primary contact between the two surfaces and the glue (see Figure 1).

For a non-flammable drywall installation, you can use a latex-based, general purpose construction adhesive, but make sure the adhesive is on the APA-

makes "DSA-20" and "DSA-40" for bonding drywall to concrete, plaster, foam insulation, and wood.

Cabinets, Countertops, and Trim

If you need an adhesive for on-site cabinet work or trim, you'll probably use a yellow glue, but this glue must be clamped while it sets (see Figure 2). To secure a countertop to the cabinets, use a structural adhesive that will not show



M. MacDonald

Figure 1. Panel adhesives reduce the number of nails needed to hang drywall. With some, you only need to nail the top and bottom plates.

approved list.

The two largest drywall manufacturers have their own preferences for adhesives. For modified contact adhesives, Gold Bond recommends "M-C Adhesive," while U.S. Gypsum prefers "Wilhold Glu-on Panel and Construction Adhesive." For panel adhesives, Gold Bond's John Hovind suggests "SS 2000G," while U.S.G.'s experts in the DAP adhesives division suggest "DAP 4000 Subfloor & Panel Adhesive" for its strong, nail-like bond. For non-flammable (and non-solvent) adhe-

through your countertop. (Some dark-colored construction adhesives telegraph through cultured marble tops.) Wood trim. Liquid hide (animal) blue has been the standard trim glue for years, but it dries slowly and requires clamping. Its one advantage is that it will wash out of the pores of wood, something that helps if a little glue squeezes out of the joint into a tight-grained hardwood. You might want to keep some on hand if a customer wants you to glue an antique chair "while you're here."



Mark Pedersen

Figure 2. Yellow glue, used to glue cabinets, furniture, and other "frame" assemblies, must be clamped or held under pressure until the bond forms.

sion, you can use "DAP Big Stick."

Other manufacturers offer products for this application too. "Sonneborn 200" adhesive, made by ChemRex, bonds drywall to most rigid foam insulation, including polystyrene and urethane, or to concrete, masonry, wood, metal, or composition board. Miracle

"White" and "yellow" glues have surpassed hide glues as carpenters' favorites. While most are relatively freeze-thaw stable, in the winter you need to take them indoors at the end of the day.

Technically, white glue is polyvinyl acetate (PVA). The adhesive is heat

ADHESIVE PRODUCT INFORMATION

B.F. Goodrich
500 South Main
Akron, OH 44318
216/374-2000

Borden Chemical Company
277 Park Avenue
New York, NY 10172
212/573-4000

C.R. Lawrence Co., Inc.
2503 East Vernon Ave.
Los Angeles, CA 90058
800/421-6144

Darworth Company
P.O. Box K Tower Lane
50 Tower Lane
Avon, CT 06001
203/677-7721
800/624-7767

DAP, Inc.
P.O. Box 277
855 North Third Street
Tipp City, OH 45371
513/677-4461

Fomo Products
2775 Barber Road
Norton, OH 44203
800/321-5585

Franklin Glue Company
2020 Bruck Street
Columbus, OH 43207
614/443-0241

G.E. Company
Silicone Products Division
Waterford, NY 12188
518/237-3330

Gloucester Company, Inc.
P.O. Box 428
235 Cottage Street
Franklin, MA 02038
617/528-2200
800/343-4963

Gougeon Bros., Inc.
706 Martin Street
Bay City, MI 48706
517/684-7286

Insta-Foam Products, Inc.
Consumer Products Division
1500 Cedarwood Drive
Joliet, IL 60435
815/741-6800
800/435-9359

Loctite Corporation
705 North Mountain Road
Newington, CT 06111
203/278-1280

Lord Corporation
Chemical Products Group
2000 West Grand View Boulevard
Erie, PA 16514-0038
814/868-3611

Miracle Adhesives Corp.
Drawer D
250-T Pettit Avenue
Bellmore, NY 11710
516/221-0950

National Casein
601 West 80th Street
Chicago, IL 60620
312/846-7300

(OSI) Ohio Sealants, Inc.
7405 Production Drive
Mentor, OH 44060
216/951-5678
800/999-8920

Pecora Corporation
165 Wambold Road
Harleysville, PA 19438
215/723-6051

Permalite Plastics Co.
608 Terminal Way
Costa Mesa, CA 92627
714/548-1137

PRC (Products Research & Chemical Corporation)
410 Jersey Avenue
Gloucester City, NJ 08030
609/456-5700
800/257-8454

Rhone-Poulenc, Inc.
P.O. Box 125
Monmouth Junction, NJ 08852
201/297-0100

SIKA Chemical Corp.
P.O. Box 297
201 Polito Avenue
Lyndhurst, NJ 07071
201/933-8800
800/631-7270

Sonneborn-Contech
7711 Computer Avenue
Minneapolis, MN 55435
612/835-3434

Tec, Inc. (H.B. Fuller)
315 South Hicks
Palatine, IL 60067
312/358-9500

3M
Adhesives, Coatings & Sealers Division
St. Paul, MN 55144-1000
612/733-1110 Operator #55

Tremco, Inc.
3735 Green Road
Beachwood, OH 44122
216/229-5000
800/321-1376

UGL
Box 70
Scranton, PA 18501
717/344-1202

Uniroyal Products Co., Inc.
Adhesives Division
P.O. Box 2000
312 North Hill
Mishawaka, IN 46544-1399
219/256-8655
800/336-1973

W.J. Ruscoe Company
485 Kenmore Boulevard
Akron, OH 44301
216/253-8148 ■

Compiled by Jim Cavanagh and Marylee MacDonald

sensitive and gums up sandpaper. You can glue miters and repair split pieces of trim with a nearly invisible joint, but if any squeezes out, you should clean it off with a damp cloth before it dries. The glue quickly seals the wood's pores, and the spots show up when you apply the finish (see Figure 3).

Stronger than white glue, most "yellow glue" is an aliphatic resin adhesive that has built-in heat resistance; it won't gum up your sandpaper. It dries rapidly and feels "tacky" when you squeeze a drop between your fingers. Because some glue only looks yellow, you should read the ingredients or get a product sheet to make sure you're using the right stuff. Franklin International, makers of "Titebond" glues, have a range of products for special needs. For example, you might try "Titebond Supreme," a glue designed for oak and other ring-porous materials. For high-humidity environments, they make a "Multibond Type II" adhesive that is water resistant (see "Waterproof Glue").

Laminate to plywood. Contact cement is the way to go when you want to bond plastic laminate to a substrate. Because most plastic laminate was originally installed with contact cement, remodelers who spot a countertop bubble or a loose edge strip should know that contact cement is one adhesive whose bond can be "revived." Heat the area with an iron. (Protect the surface with a cloth first.) Apply pressure, and the resulting bond is even stronger than the original.

If you're using contact cement in new work, watch out for explosive solvent fumes. More than one guy has been seriously burned in his shop when the furnace kicked on. Good ventilation is a must.



Figure 3. Many glues make finishing difficult if they squeeze out of the glue joint. This is not a problem with liquid hide glue, which washes out of the wood pores, but hide glue dries slowly and requires clamping.



Figure 4. When working with contact cement, spray on two or three coats to seal the substrate if porous (left). Then position the laminate above spacers. Remove the spacers, (right) working from the center out, and roll or press thoroughly to form a bond.

WATERPROOF GLUE

Exterior doors, wood storm windows, replacement shutters, cornices, and historic moldings are frequently made of built-up components or frame construction that can be strengthened by a good waterproof glue (see Figure A). You'll also want waterproof glue in places that are exposed to the continual assault of water, such as a shower stall or tub surround (see Figure B). Many adhesives are merely water-resistant, designed to stand up to "intermittent" moisture. You can use them in the sheltered area beneath a porch roof or on a kitchen backsplash, but don't expose them to the weather.

You can tell the difference between a waterproof and a water-resistant glue if you get technical data sheets from the company or read the fine print on the label. If you need a waterproof product, look for the term "Type-I" adhesive. In the case of wood, Type-I adhesives will often outlast the materials they bond. Type-I adhesives are "exterior glues" that have passed a bond test developed by the American National Standards Institute (ANSI). If you're gluing a veneer layer to an exterior door, for example, woodworkers' specifications call for a Type-I adhesive.

Only two adhesives give you a Type-I bond: resorcinol-formaldehyde resin and cross-linked polyvinyl acetate (a sub-class of white and yellow glues). Resorcinol glues are frequently used in wood-



Figure A. Built-up moldings benefit from a waterproof adhesive. This worker is gluing the last piece in place with a waterproof PVA (yellow) glue. The assembly will be clamped until the glue dries.



U.S. Gypsam, Durabond Division

working shops, but these glues are tough to control in the field because they are sensitive to heat and humidity. The best buy in this type of glue is a phenol-resorcinol, and the best place to work with it is in a shop, where you can control the environment.

An alternative is to use the more predictable PVA glue, which is not as sensitive to the humidity. Franklin's "Titebond 31," for example, looks like a normal yellow glue, but it is waterproof. You'll also find Type-I tile mastic for use in shower

Figure B. Use a Type-I ceramic tile adhesive (mastic) in wet areas around tubs or showers when you're installing tile over cement backer board.

Contact adhesives are widely used to bond dissimilar materials, especially non-porous materials. With contact adhesives, the bond forms instantaneously upon contact. When one side of the material is porous (soft woods, untempered hardboard, plywood, and plaster), you have to apply two or three coats of adhesive to the porous surface, letting the adhesive dry between coats. The adhesive dries sufficiently in about 30 minutes to make bonds (see Figure 4). For edge bonding, use the maximum pressure you can exert by hand against a 3-inch roller.

The 3M Company makes several kinds of contact cement. "Fastbond 10," a thin, syrupy, solvent-based contact cement, will bond to aluminum, hardwoods, tempered hardboard, soft wood, plywood, plaster, or steel, as will Contech's "Formica Brand 145." Be cautious about the "flash" on these. Water-based, no-flash (N-F) contact adhesives don't have a vapor problem,

surrounds. An example is Miracle's "MA-5005" or their "40+" adhesive, or you could use U.S.G.'s "Durabond D-2001," a product compatible with Durock interior cement board. If you don't see Type I listed on the label, get technical data sheets from the company. You can assume it's not a Type-I glue if it isn't listed on the label or in the literature.

When you only need a water-resistant adhesive, you'll be looking for a Type-II adhesive, like urea-formaldehyde resin, casein glue, some contact cements, and some tile mastics. Ordinary white glue and yellow glue only give you "slight" moisture resistance, according to the Architectural Woodworkers Institute.

Epoxy. Another type of "waterproof" adhesive is epoxy. Epoxies aren't rated in the same way as other adhesives because all of them are "waterproof." (The two-part system, resin plus catalyst, can't break down when exposed to water.) Though there are many different formulations of epoxy, those of most interest to carpenters are "marine epoxies." These have been formulated for strength and workability with wood. One of the best known companies, its technology driven by its interest in protecting wooden boats from deterioration, is Gougeon Bros. Their "West" epoxy resin can be combined with special hardeners, additives, and fillers for waterproof repair work or new construction.

—M.M.

HOW GLUE WORKS

Everyone knows that glue sticks two things together. This is called gluing, bonding, laminating, sticking, mudding, cementing, and clagging; the list goes on. But why do the things stick? How does glue work? What is this magic called bonding? Basically, glue works either mechanically or molecularly; or it bonds using a combination of the two. The mechanical bonding process is the easier to understand. Molecular bonding gets very involved because it makes the two parts actually become part of each other, "welding" them chemically.

Mechanical bonds are formed when the glue line between two materials flows into the tiny nooks and crannies that exist in all materials, no matter how smooth they may seem. Larger, coarser materials, such as wood or concrete, have surfaces with very large pores that allow for thicker glues, like construction adhesives. Microscopic infusion of the adhesive into the "pores" of the bonded materials creates an interlocking action, sort of like a liquid velcro. This is considered a passive bond, not actually working until some sort of stress is applied to the connection.

Glues that bond mechanically have varying viscosities to match the types of surfaces being bonded. For larger, coarser materials, a thick consistency is important. For finer textures a finer glue is needed. The glue itself needs a strong matrix after curing, since most of its holding power

is in both the glue itself and the leverage used to hold the parts together.

Mechanical bonding is strongest in compression or shear, and relatively weak in tension. A concrete block wall, where the blocks are "glued" together with mortar, is a good example.

Chemical, or specific, bonds use a molecular attraction between materials to set up the bond. These are active bonds, with the parts becoming one with each other through a molecular welding process. The glue line of these more sophisticated bonds is usually very thin. The makeup of the adhesive causes some of the molecules of each part to mix, becoming fused. Sometimes a glue will cause only certain molecules to become attracted to each other, and sometimes there will be an electron bond, with the electrons of different molecules attracting each other. This creates an irreversible bond. These are high-tech bonds and directions for use and application need to be followed closely. Many of these adhesives require a specific primer. Without this special preparation a true bond can never form. Some epoxies and many silicone-type glues require these primers. One RTV adhesive that I have used requires a primer for the glass surface and a different primer for the aluminum part. Areas that have not been primed refuse to allow a bond.

—J.C.

but to bond properly they require greater pressure than you can get on the job. These are designed for shop conditions.

Tile, Slate, Marble

Rigid materials require a rigid, gap-filling adhesive that will not give once it has set. When an adhesive is used on walls, it must grab quickly to prevent the material from slipping.

Tile to plaster, drywall, or concrete. If you have to replace a couple of loose tiles, tech rep Ken Erikson from the

Tile Council of America recommends a waterproof organic adhesive for wet areas. Chapco's "Multi-Purpose Wall & Floor Adhesive" or Miracle's "MA-5005 Wall & Floor Adhesive" are two that carry a Type-1 (waterproof) rating.

Marble/slate to concrete or wood. If you are installing marble or slate in an entry, your adhesive must set up quickly to form a rigid base, or a corner of the material could snap off. A number of manufacturers make thin-set, cementitious mortars for marble, slate, and tile. Contractors in our survey mentioned

Miracle Co.'s "Thin-Set +" and H.B. Fuller's "TEC Full Set."

Metal, Plastics, and Glass

Metal, plastics, and glass are non-porous materials and require adhesives that cure chemically (contact cement, epoxy, or "superglue"). Most other adhesives depend on solvent or water evaporation to set up and bond. If you try to use an adhesive that cures by evaporation to bond two non-porous surfaces, you're merely "putting the lid back on the can." Because the solvent can only escape at the edges, the stuff will never dry.

Metal to other materials. Contact adhesives and epoxies don't depend on evaporation. Many can be used to bond metals. Because rubber-based adhesives form a chemical bond with metal, and are easier to work with than epoxies, they're a good bet for metal roofs and buildings. Many are formulated for the high temperatures and flexibility requirements of metal structures. Not everyone makes these rubber-based adhesives, but two that do are Rhone Poulenc ("Rhodorsil 5C") and PRC ("Rubber Calk"). To bond metal studs to drywall, one of our contractors suggested Contech Brand's "PL100 Dry-wall Adhesive" and OSI's "Panel and Foam Adhesive."

Flexible plastic to other materials. You may decide to use plastics instead of glass when you glaze storm windows, doors, or cabinet doors. Finding the right adhesive won't be easy because there are many different kinds of plastics on the market. To know whether a particular adhesive bonds to plastics (such as "Plexiglas"), do a test patch. Designed to bond many flexible plastics, both Miracle's "L-4000 Facing Adhesive" and Rhone Poulenc's "Rhodorsil 5C" bond to most substrates and to polycarbonate, acrylic, polyester, PVC, and fiberglass. You might also try 3M's new product line of "Pronto Instant Adhesives" for small repair jobs (like when you knock the homeowner's favorite blow-dryer on the floor). These adhesives are clear, one-part cyanoacrylate (like a "Superglue"), but they have extremely high bond strengths (up to 5,000 psi), and they bond a number of hard-to-bond plastics and substrates.

Mirrors to drywall. Mirrors require chemically dormant adhesives that will not attack the silver. Black mirror mastic spreads on with a trowel, or you can put "pats" or "gobs" on the mirror. You

can use Pecora's "7HR4 Mirror-Tac" to bond mirrors, blackboards, and even slate, but you have to keep it warm before and during use. Or, for small jobs, try Contech's "PL Mirror Mastic."

Glass to other materials. Glass is almost always exposed to the weather, so an adhesive has to tolerate temperature extremes and water if it's to work. Glaziers we talked with recommended "G.E. 1200" silicone adhesive/caulk or "Rhodorsil 6B." Silicone is expensive, but you only need small quantities for most glass installations. The glazing in residential construction is positioned and held mechanically, so the adhesive is merely placed to form a weathertight bond between the glass and the surround.

For glass to glass or ceramics, you can use 3M's "4475," "Spray 90," or "2216 Epoxy." For glass to wood, try 3M's "2216 Epoxy" or PRC's "PR-943," both are flexible, high-strength epoxies.

Insulation

Codes require foundation insulation, but what do you use to stick it to the walls? The adhesive needs good gap-filling properties, and it needs to be able to stick to both the insulation and the foundation. You want the product to last a long time (often in a damp crawlspace) without the aid of fasteners. Nothing will stick to wet basement walls or walls with fuel-oil residue or form-release agents. You'll have to clean the walls with solvent to get rid of residue before using an adhesive.

Polystyrene foam to wood/block. Solvents in some adhesives eat polystyrene insulation. It's safest to use adhesives labeled for the foam you are using. If you have any questions, place a bead of adhesive between two pieces of foam and allow it to remain overnight. Break it apart the following morning, and inspect it to see if the adhesive has etched, dissolved, or softened the foam.

Kansas City's Aylward Products recommends Franklin "Foam and Wall Adhesive," "Sonneborn 200," or 3M's "Scotchgrip 4289" or "4323." These are trowel-on materials. Or you can try "DAP 2000" or "Panelweld."

Polyurethane foam to wood. DAP recommends "DAP 2000," but not "400." Or you can use latex-based "DAP Big Stick." ChemRex recommends "Sonneborn 200."

Gluing to Concrete/Masonry

Before you glue anything to concrete

ADHESIVE CHOICES FOR BUILDING APPLICATIONS

Facing Surfaces	Gypsum									
	Brick Stone	Concrete Block	Concrete	Board (Drywall)	Gypsum Plaster	Hardboard	Metal	Particle Board	Plywood	Wood
Brick Veneer	Dbe	Dbe	Dbe	BDfhm	BDfhm	BDfhm	Dbek	BDfhm	BDfhm	BDfhm
Carpet	Bfhm	Bfhm	BFHM	Bfhm	Bfhm	Bfhm	Bfhm	BFHM	BFHM	BFHM
Ceramic, Slate, Quarry Tile	Bc	Bc	Bcf	BFch	BFch	BFch	Bc	BFch	BFch	BFch
Cove Base	DLbh	DLbh	DLbh	DLbh	DLbh	DLbh	Dhb	DLbh	DLbh	DLbh
Cultured Marble	BD	BD	BDh	BDh	BDh	BDh	BD	BDh	BDh	BDL
Furring Strips	BD	BD	BD	BDfm	BDfm	BDfm	D	BDfm	BDfm	BDfm
Gypsum Drywall	BD	BD	BDfm	BDafm	BDfm	BDafm	BD	BDafm	BDafm	BDafm
Hardboard Paneling	BD	BD	BDfm	Bdafm	Bdafm	Bdafm	BD	Bdafm	Bdafm	Bdafm
Metals	Bdk	Bdk	BDck	BDhkm	BDhkm	BDhkm	BCDEK	BDhkm	BDhkm	BDhkm
Marble	Bdk	Bdk	Bdk	Bdk	Bdk	Bdk	Bdck	Bdk	Bdk	Bdk
Wood Parquet	BDhk	BDhk	ABdhk	ABDhk	BDhk	ABdhk	BDcekh	ABdhk	ABDhk	ABDhk
Plywood & Paneling	Bdfm	Bdfm	Bdfm	ABdfm	ABdfm	ABdfm	BDfm	ABdfm	ABdfm	ABdfm
Polystyrene Foams	ABFHM	ABFHM	ABFHM	ABFHM	ABFHM	ABFHM	BFHM	ABFHM	ABFHM	ABFHM
Polyurethane Foams	ABDFHM	ABDFHM	ABDFHM	ABDFHM	ABDFHM	ABDFHM	Bdh	ABDHM	ABDFHM	ABDFHM
Sub-Flooring	BD	BD	BD	BDam	BDam	BDam	BD	BDam	BDam	BDam
Tileboard (Wallboard)	B	B	B	Bl	Bl	Bl	Bd	Bl	Bl	Bl
Plastic Tub & Showers	B	B	B	Bfhm	Bfhm	Bfhm	B	Bfhm	Bfhm	Bfhm
Wood Flooring, Strip & Plank	Bcdk	Bcdk	Bcdk	Bdk	Bdk	Bdk	Bdk	Bdk	Bdk	Bdk

ADHESIVE TYPES

A) Polyvinyl Acetate. B) Butadiene Styrene (SBR). C) Epoxies. D) Neoprene Rubber. E) Nitrile/Acrylonitrile (BUNA N). F) Latex Emulsions. G) Hot Melts. H) Acrylics (Latex). I) Animal Glues. J) Resorcinol. K) Polyurethanes. L) Resin/Rosin Based. M) Ethylene/Vinyl Acetate. Capital letters indicate the most commonly used adhesives. Lower case can also be used. Source/Franklin Adhesives and Robert Miller

or masonry, test to see if the surface is dry. Tape a 36-inch-square piece of polyethylene film onto it. If the concrete or masonry is damp, condensation will show up within 48 hours. You may have to reroute the downspouts or have the owner regrade the slope around the house before you take a chance on finishing below-ground space. Once you've made sure the surface is dry, choose a good gap-filling adhesive because a concrete or masonry surface is bound to be uneven.

Wood to concrete/block. If you want fastening power to dry concrete, you could use 3M's "4323 Construction Mastic" or "1838 Epoxy." Their mastic is designed for bonding concrete to hardwoods, plywood, concrete, aluminum, steel, or polystyrene foam. You can use it for basement paneling or wherever a high-strength bond with good flexing and racking resistance is needed. The "1838 Epoxy" bonds wood to concrete, and it also bonds most rubber, metal, or plastics products.

If you're faced with the stickiest of all adhesive problems, like bonding to damp concrete, you may find a friend in one of the Sika Corp.'s "Sikadur" adhesives. Almost all of these are designed to bond other materials to concrete—even to damp concrete—or to repair concrete cracks and bond new concrete to old.

Desperation Adhesives

A contractor doesn't have to be an adhesive engineer to determine which glues work best in a given situation. You can lick a stamp and it will stick on an envelope all the way to Japan, but you can lick a 2x4 all day long and it won't stick to anything.

You need to match the strength, bonding, and filling properties of an adhesive to the job requirements. Consider the conditions under which the bond will be expected to work: humidity, moisture, heat, cold, or exposure to sunlight. Though adhesives are often

used in addition to a mechanical fasteners, they're also expected to stand on their own.

Take a little time and write for information from adhesive manufacturers (see "Adhesive Product Information"). They'll send information that can help you escape from any sticky situation.

The manufacturer wants to help you get the right technical information. Aside from the fact that everyone in business is afraid of being sued, they will work just as hard to keep you from using an improper adhesive as they will to sell you their product. Many of them have 800-numbers and technical people available to answer your questions.

Many adhesives have specific requirements for their proper usage. Some need to be stored at certain temperatures, some can be thinned, many have shelf lives and pot lives which do not lend them to job-site use. You'll have to take temperature and humidity into consideration with some adhesives, and the actual application can make or break the bond. Whether rolled, brushed, troweled, or gunned on, adhesive quantities and consistencies have to be considered, as well as the skill level of the worker applying the stuff. The condition of the bonding parts also is important. Some adhesives will work on frozen wood, as long as there is no frost on the surface. Some glues require the parts to be sanded, others planed, primed or scored, so it is obvious that one of the important elements in a good bond is knowledge. ■

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