A guide for handling and using G/flex 650 Epoxy

Instructions for handling epoxy and basic techniques. Sample projects include repair to plastic canoes and kayaks, wooden boats, and household and sporting equipment. Also included are tips on gluing to wet surfaces and gluing underwater, joining wood, gluing in fasteners, and blending epoxies.

G/flex 650 Epoxy is the result of years of experimentation to develop a toughened epoxy that was simple to use and would adhere tenaciously to a variety of materials under difficult conditions.

G/flex 650 is all that, and more. It is a marine-grade glue that can be accurately mixed in small batches with a simple 1:1 mix ratio. It has the advantage of a long open working time and a relatively short cure time.

G/flex 650 is, first of all, a high-strength epoxy—designed for permanent, waterproof, structural bonding. Furthermore, G/flex has a modulus of elasticity of 1.03 GPa, which gives G/flex the toughness to make structural bonds that can absorb the stresses of expansion, contraction, shock, and vibration.

G/flex adheres tenaciously to difficult-to-glue hardwoods, both tropical and domestic varieties—white oak, Ipe, teak, greenheart, purpleheart and black walnut to name a few. G/flex also has the ability to glue damp woods. It can be used on wet surfaces, even underwater when applied with specific techniques.

G/flex is ideal for bonding a variety of other materials, including dissimilar ones—metals, plastics, glass, masonry, and fibreglass.

We encourage you to read these instructions and then experiment with G/flex. We think you will find many projects for which the particular properties of G/flex are ideally suited. As always, our Technical Staff is available to answer your questions, and we will be eager to hear about your projects and repairs using G/flex Epoxy.

Handling Epoxy & Basic Techniques

Safety

- Avoid skin contact with resin, hardener or mixed adhesive. Wear liquid-proof gloves and adequate protective clothing to keep the epoxy off your skin.
- Avoid eye contact with resin, hardener or mixed adhesive. Wear protective glasses. In case of contact with eyes, flush with water for 15 minutes and consult a physician.
- Avoid inhalation of vapours. Provide adequate ventilation. Wear a dust mask when sanding epoxy, especially epoxy that has not fully cured.
- Read and follow safety information on resin and hardener containers.

Starting out

Remove and discard the red inner seal from both containers. Trim the tip of each spout about 6mm from the end.

Before mixing epoxy, gather all necessary application tools, clamps and equipment. Check all parts for proper fit and be sure all surfaces to be glued are properly prepared.

Mixing and curing

Dispense equal volumes of G/flex 650 Resin and Hardener into a small mixing cup (1). Use a mixing stick to thoroughly blend the resin and hardener, while scraping the sides and bottom of the mixing cup (2). Small quantities can be mixed on a paper or plastic palette.

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After mixing the resin and hardener, you will have about 45 minutes, at 72°F (22°C), to apply the mixture before it begins to gel

and up to 75 minutes to assemble and clamp parts after it is initially applied. At 72°F (22°C), the adhesive mixture will solidify in 3–4 hours and reach a workable cure in 7-10 hours. The adhesive may be sanded, clamps can be removed, and joints can be moderately loaded. Wait 24 hours before subjecting joints to high loads.

G/flex 650 Epoxy cures faster in warmer temperatures and slower in cooler temperatures. When a quicker cure is desired, apply moderate heat to substantially reduce cure time. Cure time is reduced by half with each 18°F increase in temperature.

G/flex 650 will cure in temperatures as low as 40°F (5°C), but cure very slowly. When using 650 at lower temperatures, it is a good idea to warm resin and hardener to room temperature for easier dispensing and mixing.

Curing epoxy generates heat. Thicker layers of 650 generally cure a little faster than thinner layers, as this heat is concentrated in thicker layers and dissipated in thinner layers.

Cleanup

Clean uncured epoxy from skin and clothes with the alcohol pad provided, followed by washing with soap and water. Remove excess epoxy from work surfaces with the flat end of a mixing stick or with paper towels. Clean up residue with an alcohol pad, citrus-based cleaner, acetone or lacquer thinner.

Basic surface preparation

For best adhesion, gluing surfaces should be:

CLEAN—Remove loose, chalky or flaky coatings, and contaminants such as grease, oil, wax, and mould release. Clean contaminated surfaces with an appropriate solvent applied with plain white paper towels. Wipe the surface with a clean, dry paper towel before solvent dries. Do not use laundered rags to apply or remove solvent as they may contaminate the surface with fabric softener residue.

SANDED—Sand smooth and non-porous surfaces with 80-grit sandpaper to provide good texture for the epoxy to “key” into. Brush away sanding dust.

DRY—Although G/flex 650 Epoxy can be used to bond damp and wet surfaces (see *Gluing to wet surfaces and surfaces under water*, on the reverse side), maximum adhesion will be achieved when bonding to dry surfaces.

Additional surface preparation

Metals

Sand or grit-blast the surface to expose bright metal.

Clean the area with acetone or lacquer thinner using white paper towels. Allow the surface to dry completely.

Abrade through wet epoxy—Apply a thin coat of G/flex 650 Epoxy and immediately scrub metal surfaces through the wet epoxy coating with a fine wire brush or sandpaper.

Adhesion to aluminium can best be improved by treating it with the two-part propriety Aluminium Etch prior to applying the epoxy. Aluminium can be prepared using the “abrade through wet epoxy” method with good results if an aluminium etch kit is not available.

Plastics

Sand ABS, PVC and polycarbonate plastics with 80-grit sandpaper to provide texture for improved adhesion.

Some plastics like HDPE and LDPE (high-density and low-density polyethylene) benefit from flame treating. First wipe the bonding surface with a solvent to remove contamination and dry with a clean paper towel.

FLAME TREATING—Pass the flame of a propane torch across the surface quickly. Allow the flame to touch the surface, but keep it moving—about 30 to 40 cm per second. No obvious change takes place, but the flame oxidizes the surface and dramatically improves adhesion with adhesives and coatings applied over it.

While flame treating will improve adhesion to most plastics, it appears to provide the greatest benefit to polyethylene. If you are unsure of the type of plastic, it doesn’t hurt to flame treat.

Hardwoods, including tropical woods

Bonding to dry wood (between 6 and 12% moisture content) is best for achieving long-term reliable bonds. Sand mating surfaces with 80-grit parallel to the grain. Clean oily woods with a WEST SYSTEM 850 Solvent such. Apply solvent with plain white paper towels. Wipe the surface with a clean, dry paper towel before solvent dries. Do not use laundered rags to apply or remove solvent.

The extent of wood failure in tensile adhesion tests indicate that tensile adhesion achieved using G/flex 650 Epoxy, with proper surface preparation, approached the grain strength of the wood in all of the woods we tested.

Surface preparation for various dry materials		
Material	**Basic surface preparation**	**Additional surface preparation**
Fibreglass laminate	As necessary, Remove soft and loose surface material Remove contamination with solvent wipe Sand with medium-grit sandpaper	
Aluminium		Aluminium Etch, two part
Steel		Wire brush through wet epoxy
Steel-galvanized		Wire brush through wet epoxy
Copper		Wire brush through wet epoxy
Bronze		Wire brush through wet epoxy
Lead		Wire brush through wet epoxy
ABS		Flame treat optional
PVC		Flame treat optional
Polycarbonate (Lexan™)		Flame treat optional
HDPE, LDPE plastic		Flame treat
Ipe		70% Isopropyl Alcohol wipe
Teak		Solvent wipe
White oak		
Walnut		
Purpleheart		
Greenheart		

Bonding

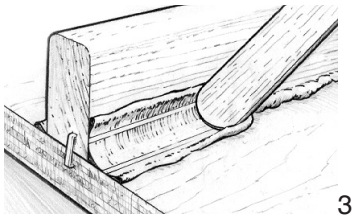
Apply the epoxy mixture to all properly prepared mating surfaces and clamp the components in position before the epoxy begins to gel—about 75 minutes at 72°F (22°C). Use just enough clamping pressure to squeeze a small amount of epoxy out of the joint. Leaving some glue in the joint increases bonding strength. Allow the epoxy to cure thoroughly before stressing the joint.

Thicken the epoxy with WEST SYSTEM 406 Adhesive Filler, included in the kit, as necessary to fill voids when gluing uneven mating surfaces or to bridge gaps in joints.

Use a spreader or notched trowel to apply G/flex 650 Epoxy to larger surfaces prior to clamping. Use a pipe cleaner or syringe to apply adhesive to hard to reach areas such as cracks and fastener holes when bonding hardware.

Making fillets

When parts are joined at or near right angles, fillets can be used to add considerable strength to the joint by increasing the surface area of the bond. Make fillets by applying a bead of G/flex 650 Epoxy, thickened with the filler provided to a mayonnaise consistency, along the inside corner of the joint. Form the epoxy into a cove section using the round end of a mixing stick **(3)**. Clean off the excess epoxy with the bevelled end of the mixing stick before the epoxy gels **(4)**.



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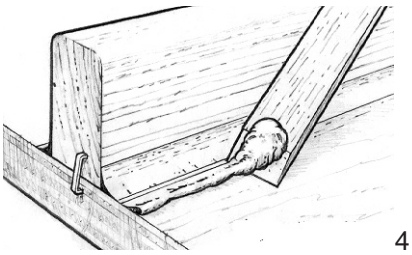

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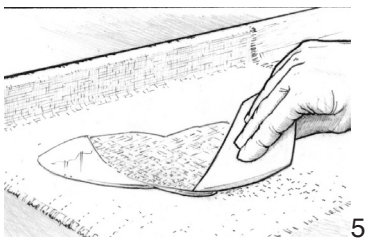
Fibreglassing

Lightweight fibreglass fabrics and tapes (4–9 oz/sq yd range) can be used with G/flex 650 Epoxy when fibre reinforcement is desired to add stiffness or abrasion resistance, or to patch a damaged area.

Cut the fabric to fit the area. If heavier reinforcing is desired, use multiple thin layers rather than a single thick layer. Properly prepare the surface before applying fabric.



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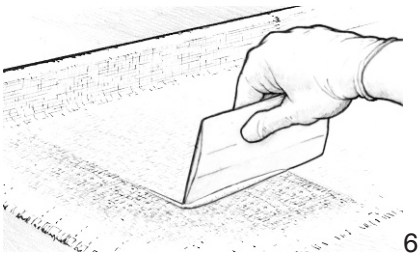

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Coat the substrate with 650. Lay the fabric in position on the wet adhesive. Spread mixed adhesive onto the fabric using a plastic spreader **(5)**. When the fabric and substrate have been saturated, use the spreader to smooth and remove excess epoxy **(6)**. Repeat the process with additional layers.

Fairing (surface filling)

Use WEST SYSTEM 407 Low-Density Filler to thicken G/flex 650 Epoxy for use as a fairing compound. This mixture also works for light bonding, surface filling, and shaping. The more 407 Filler you add to the epoxy, the easier it will be to carve and sand. Use a mixing stick or spreader to apply and shape the mixture slightly higher than the desired surface contour. Sand it to shape after the epoxy cures. Seal the sanded fairing compound with unthickened epoxy before painting.

Coating and re-coating

G/flex 650 Epoxy can be used as a moisture barrier coating. It has a mixed viscosity similar to honey, but it has good flow characteristics when brush applied. Use a stiff bristled brush (cut the bristles of a standard paintbrush to half their length) or apply with a flat spreader for best results. On horizontal surfaces, a fine notched trowel can be used to apply a uniform coat. One to two coats are usually enough given the viscosity of G/flex 650 Epoxy.

If you are gluing to or applying more coats of epoxy, apply the next coat while the previous coating is still tacky—usually 2–3 hours after applying at 72°F (22°C). Cured G/flex can be varnished, painted, or recoated or bonded to with epoxy. Wash cured G/flex with water and sand surfaces to a dull finish, providing a texture for good adhesion.

WEST SYSTEM® Epoxies

G/flex 650 Epoxy is the latest addition to the WEST SYSTEM line of epoxy products. While G/flex offers physical properties and applications that are different than WEST SYSTEM 105 Resin-based epoxies, they share the same high standards for performance and reliability.

For forty years, reliability has been the hallmark of WEST SYSTEM. We adhere to the highest standards of quality assurance in our formulating and manufacturing practices, from raw material qualification to testing and certification of finished resins and hardeners. This means that every properly mixed batch of WEST SYSTEM resin and hardener, including G/flex resin and hardener, will cure as it is supposed to, every time. This commitment to quality has earned certification to the ISO 9001:2008 standard. WEST SYSTEM is your reliable solution.

Outstanding customer service

WEST SYSTEM provides you with something else as reliable as our epoxy—knowledge. Whether your project is large or small, the WEST SYSTEM Technical Staff and comprehensive instructional publications will help assure the success of your building and repair project. WEST SYSTEM is renowned for its outstanding customer service.

WEST SYSTEM technical publications and DVD provide detailed procedures and instructions for specific repair and construction applications.

The WEST SYSTEM website provides basic product information, dealer locations and links, project articles and galleries, and safety information. Visit west-system.co.uk.

Further assistance can be obtained by contacting the friendly and knowledgeable Technical Staff. Send e-mail to Techinfo@wessex-resins.com or go to our website www.wessex-resins.com.

Gougeon Brothers Inc.
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Sample projects

The repairs described on this page are just a sample of the potential uses for G/flex® 650 Epoxy. Products not included in the kit can be found in the *WEST SYSTEM® User Manual& Product Guide* and are available at WEST SYSTEM dealers.

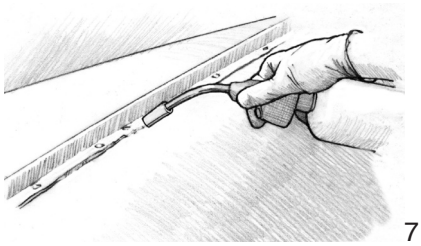
Be sure to read *Handling epoxy* and *Basic techniques* on the reverse side of this guide before beginning these repairs.

Aluminium boat seam repair

Determine the exact locations of leaks by putting the dry boat in the water or partially filling a small boat with water to see where it leaks.

Pressure wash the leaking area to be sure debris is removed from the rivets and seams. Abrade the area with a wire wheel on a drill motor or a wire brush to further remove debris. Drain and dry the boat.

Mix a small batch of G/flex 650 Epoxy and transfer it to a syringe included in the kit.



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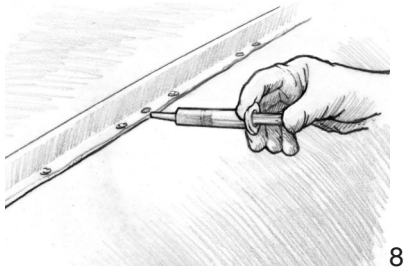

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Heat the leaky seams with a heat gun or propane torch. The heat will drive residual moisture from the seams in the form of steam or boiling water, which is a good visual indicator that you are bringing the metal up to temperature **(7)**.

Inject the epoxy with the syringe or apply it with a small brush along the seam while the metal is still warm **(8)**. The epoxy will thin when it touches the warm metal and will flow deep into the crack. Use the heat gun to warm the metal along the seam as you direct the epoxy into it. The heat will help release air in the epoxy and speed the cure.

On very loose and leaky joints, a combination of new rivets and epoxy will work best. If rivets are not available, leaks have been sealed by filling the seam with thickened epoxy.

First warm the metal and apply the liquid epoxy as described above. Then use a putty knife, plastic spreader or syringe to force thickened G/flex into the seam. Thicken the epoxy with 406 Colloidal Silica Adhesive Filler, included in the kit, to a mayonnaise consistency. Try to push the mixture through the seam to the other side of the hull. Thickened G/flex will bridge gaps and stay in the seam until it cures.

420 Aluminium Powder can be added to the thickened epoxy mixture prior to forcing it into the seams to make the repair less obvious and to provide UV protection for the epoxy.

Wipe up excess uncured epoxy from both sides using paper towels and dry cheesecloth. Solvents can be used sparingly if care is taken to avoid washing out the epoxy in the seam or dissolving paint in the area.

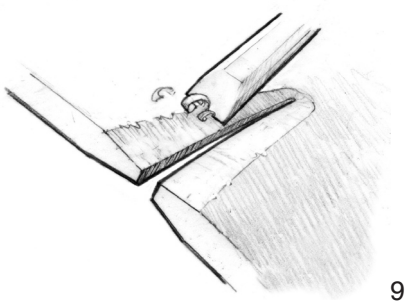
Let the epoxy cure overnight before using the boat. You may you use a heat gun or heat lamp to shorten the cure time. For every 18°F increase in temperature, G/flex cures in half as much time, but do not heat the curing epoxy over 120°F (49°C).

Plastic canoe & kayak repairs

Plastic canoes and kayaks are often made with thermoformed plastics like HDPE (high-density polyethylene), ABS, and occasionally PVC. G/flex adheres to these materials if specific surface preparations are followed. Refer to the *Surface Preparation* chart on the reverse of this page.

Split and crack repair

Open up cracks and splits with a sabre saw or hacksaw blade to create a slight gap in the break. Bevel the edges of the crack with a sharp scraper like the end of a sharp chisel or with a cabinet scraper to create a $^{3}/_{8}$" to $^{1}/_{2}$" long bevel on both sides of the split and on both sides of the hull **(9)**. Sand the bevelled surfaces to round the edges and create more taper with 80-grit sandpaper **(10)**.



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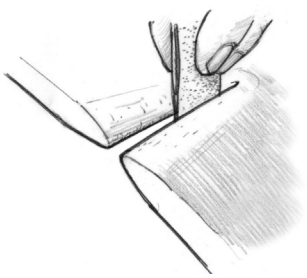

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Flame treat HDPE and LDPE (high-density and low-density polyethylene) plastic with a propane torch to oxidize the repair surfaces. See *Special surface preparation* on the reverse of this page.

Mix an appropriately sized batch of G/flex 650 Epoxy. Apply a bead of the adhesive to the bevelled joint, overfilling it slightly.

Cover the adhesive filled joint with 2" wide cellophane packaging tape while forcing the excess (overfill) epoxy through to the other side of the joint. Avoid using too much force, which could leave the taped side under filled.

Spread out the adhesive on the opposite side to fill in the bevelled seam. Add or remove epoxy to fill the bevel flush.

Allow to cure 7–10 hours before removing tape. Use a scraper or sandpaper to remove high spots and smooth the surface. Paint the area with plastic-compatible paint like Krylon™ Fusion.

Small hole repair

Canoes and kayaks are often dragged over sand and rocks, resulting in worn off ends and eventual leaks near the bow and stern.

Clean the area being repaired with a mild solvent like rubbing alcohol and paper towels. Sand with 80-grit sandpaper to create a slight taper around the perimeter of the repair. Flame treat the repair surfaces of HDPE and LDPE plastics.

If the worn section has a gap that is too wide to bridge with G/flex 650 Epoxy, say $^{1}/_{4}$" to $^{3}/_{8}$" across, cover the back of the hole with a temporary backer to support the epoxy while it cures. The backer can be a wad of plastic wrap, piece of polystyrene foam, or any appropriately shaped material covered with plastic wrap. The plastic wrap will allow for easy removal after the epoxy cures.

Mix an appropriately sized batch of G/flex 650 Epoxy.

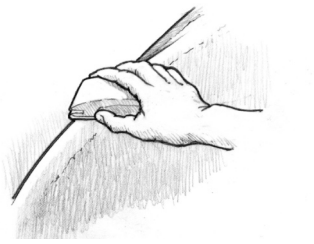
Apply the adhesive to the area with a mixing stick or plastic spreader. Apply enough epoxy to fill the hole and build up low areas to match the original thickness. Apply additional epoxy, if necessary, while previous applications are still tacky.

Allow to cure 7–10 hours before removing excess cured epoxy and shaping the surface with a cabinet scraper, file, or sandpaper. Paint the area with a plastic- compatible paint like Krylon Fusion™.

Create skid plates / repair larger holes

Avoid wearing holes on the keels and ends of canoes and kayaks by applying an abrasion resistant fibreglass strip on the wear areas. Fibreglass or Kevlar™ reinforcement can also be used to patch larger holes (over $^{3}/_{8}$").

Clean the surface with a mild solvent like rubbing alcohol and paper towels. Sand the end of the canoe along the bottom and up the sides a few inches with 80-grit **(11)**. This area will define the size of the skid plate. Flame treat HDPE or LDPE plastics. If you are patching a hole, cover the back with a temporary backer as described earlier.



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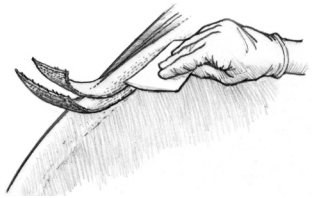

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Cut three or four layers of light fibreglass cloth (4–6 oz fabric) to cover the sanded area. Cut the bottom piece of fibreglass to fit to the sanded/flame-treated boundary. Trim each successive layer an inch or two narrower and shorter than the previous. This tapers the thickness of the fibreglass skid plate/patch toward the edges so it will easily deflect and cling to the hull as it flexes.

Mix enough G/flex 650 Epoxy to wet out and apply one or two layers of fabric.

Apply a coat of epoxy to the sanded/treated area. Lay the largest piece of fibreglass onto the adhesive. Apply more adhesive to wet out the fibreglass cloth. If necessary, a heat gun can be used to warm the epoxy and improve wet out in cooler temperatures. Use a spreader to smooth the fabric and remove excess epoxy **(12)**.

Repeat the fibreglass application with the remaining piece(s). Centre each smaller layer on the one before it. Wet out the fabric, and then use a spreader to smooth the fabric and remove excess epoxy.

Apply a coat of adhesive to fill and smooth the edges of the fabric if desired while the fibreglass application is still tacky.

Allow to cure 7–10 hours before removing any rough edges or excess cured epoxy with a cabinet scraper, file or sandpaper. Paint the area with a plastic compatible paint like Krylon Fusion™.

Wood construction and repair

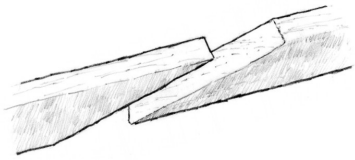
G/flex 650 is an excellent adhesive for wood. It is especially good for gluing native hardwoods like white oak and for tropical woods like teak and purpleheart. There are many uses for G/flex Epoxy in building and repairing boats, indoor and outdoor furniture, cabinetry, and trim.

Refer to *Special surface preparation* and *Bonding* on the reverse page for basic gluing information. Here are some additional wood bonding applications that extend the uses of G/flex 650 Epoxy.

Joining wood

BUTT JOINTS are used to edge glue lumber to create wider boards. Edges are typically square cut at 90° and simply butted up to one another when gluing. This joint is used for edge gluing lumber; it is not recommended for end gluing, or lengthening boards parallel to the grain.

SCARF JOINTS are used to join two pieces of wood together along their length. The ends of lumber are machined with an 8:1 to 12:1 bevel angle (13). Longer bevels create more gluing surface and potentially stronger joints. Scarf joints are often used to replace damaged sections of frames and ribs in traditionally built wood boats. Use G/flex 650 unthickened if your fits are good or thicken G/flex 650 with the 406 Filler provided to bridge gaps in the joint.



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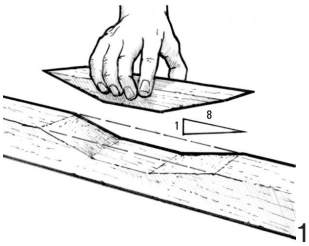

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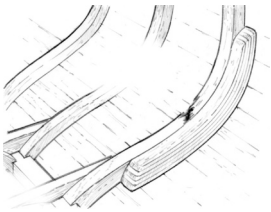
A DUTCHMAN is a wood splice used to repair damaged sections of wood timbers. We recommend creating an 8:1 bevel (14) on each end of the joint to provide adequate gluing area to maintain structural integrity.



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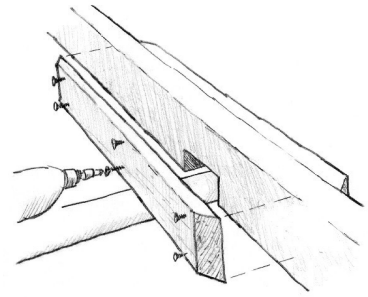
SISTER PLANKS are used to build up the strength of the lumber by gluing additional pieces or sister planks on one or both sides.



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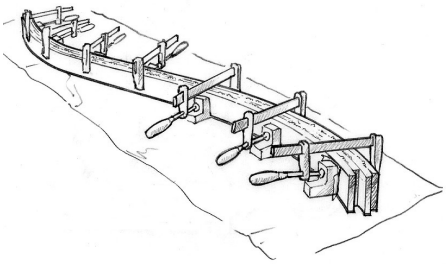
Bond sister planks where structural members have been damaged by rot (15) or weakened by cut outs for plumbing or drain holes (16). They are useful where weight or appearance is not a factor.



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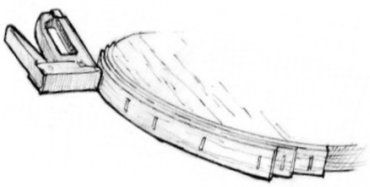

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LAMINATING multiple layers of wood strips is a great way to create custom-shaped lumber for frames, sister frames, legs, arches, railings, and trim. Laminated lumber is stronger and more stable than steam bent or sawn lumber. Glue strips using the preparation and bonding techniques on the reverse page. Use a jig or mould to clamp strips to the desired shape (11, 12). Jigs should be strong enough to provide even clamping pressure and prevent spring back until the epoxy cures.

Repairing splits, cracks and delaminations

Paddles, oars, garden tool handles, and sports equipment made with wood or laminated materials can split or crack under normal use or abuse. Ice hockey sticks, for example, are exposed to bending loads as well as high shock forces from impact with the puck, the ice, and other sticks. Handles and blades often chip and split, as does the equipment from many other sports. G/flex 650 Epoxy's tenacious adhesion and ability to resist shock loads make it a good choice for these kinds of repairs.

Insert a wedge into the crack(s) to expose as much bonding area as possible without increasing the damage. Heat the area to be repaired with a heat gun or hair dryer. This will lower the epoxy's viscosity on contact, allowing it to penetrate deeper into cracks. Fix the item in position so gravity will pull epoxy into the crack.

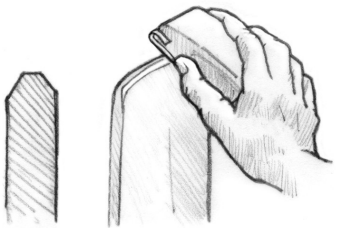
Mix a small batch of G/flex 650 Epoxy. Work epoxy into the crack with the mixing stick or a small brush, or inject epoxy with an 807 Syringe. Use a fine blade or stick to push epoxy as far down into the crack as possible.

Wait a few minutes for absorption to take place before removing wedge and clamping the crack(s) closed. Allow to cure 7–10 hours before removing clamps and sanding away epoxy squeeze-out. Wait 24 hours before using.

Thicken the epoxy as necessary to bridge gaps or fill in missing material. A layer or two of light weight fibreglass fabric (4–6 oz) can be applied for additional reinforcing. Refer to *Fibreglassing* on the reverse page.

Create durable tips on wood paddles & oars

The tips of canoe and kayak paddles take lots of abuse from scraping bottom, pushing off rocks, and fending off debris. Use G/flex 650 Epoxy to produce a durable edge to protect tips from damage.



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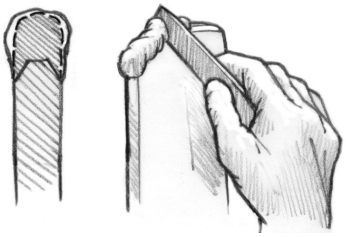
Sand varnish or paint from the tip of the paddle to expose fresh wood. Use sandpaper on a hard sanding block to create a slight bevel around the edge of the paddle tip **(19)**.

Apply a generous coating of G/flex 650 Epoxy to the sanded surfaces to wet out the exposed end grain.



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Mix an appropriate amount of G/flex 650 Epoxy thickened with 406 Colloidal Silica Filler to a mayonnaise consistency. Apply a thick bead of the thickened mixture around the edge of the paddle blade **(20)**. Apply additional thickened epoxy to extend the tip, if desired, after the initial application has gelled and will support the additional weight.

Allow to cure 7–10 hours. Wash with water before shaping the tip with a file or sandpaper. Apply paint or varnish if desired.

Gluing to wet surfaces and surfaces underwater

While gluing to a dry and properly prepared surface is best for producing reliable long-term bonds, gluing to damp, wet, and even underwater surfaces is possible.

Abrade bonding surfaces with 80-grit sandpaper. Mix an appropriately sized batch of G/flex thickened with 406 Filler to a mayonnaise consistency. Gluing to wet surfaces requires a thickened adhesive that will displace water in the scratches and pores at the bonding surface when it is applied.

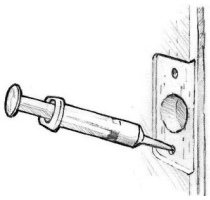
Forcefully apply the thickened epoxy onto the bonding surfaces with a plastic spreader or stiff brush.

Bring the mating surfaces together and apply just enough clamping pressure to squeeze out excess epoxy and moisture. Allow to cure 7–10 hours before removing clamps and 24 hours before stressing the joint.

Bonding fasteners

G/flex 650 Epoxy can be used for a variety of household and marine projects and repairs that involve threaded fasteners, especially fasteners subject to shock or vibration. Installing screws and other threaded fasteners with G/flex 650 Epoxy dramatically im-proves load carrying capacity. Use G/flex 650 Epoxy to install new fasteners and hardware, repair stripped screw holes and replace missing wood around fasteners. When cured, G/flex can be sanded, sawn, nailed and screwed. Small screws, nails, and tacks can be driven into it without pre-drilling. Larger fasteners may require a pilot hole. Experiment for best results.

The easiest method is to simply wet out new pilot holes (or stripped fastener holes) **(21)** with G/flex 650 Epoxy prior to installing the screws **(22)**. The epoxy will soak into the exposed end grain on the inside of the hole, effectively increasing fastener diameter. This results in more holding power, and seals water out so the wood stays drier. Drier wood is stronger than damp wood.



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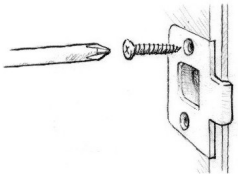

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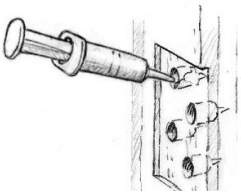

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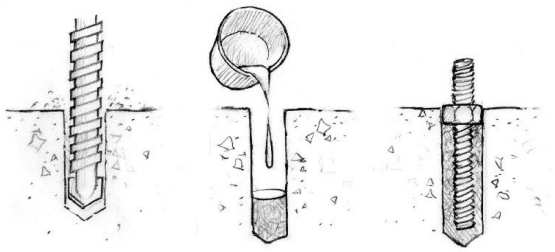
For even greater strength and stability, drill oversized holes 2/3 the depth of the fastener. Wet out the holes and the fastener with epoxy, then fill the hole with thickened epoxy/adhesive filler **(23)**. Use 406 Colloidal Silica Filler to thicken the epoxy to a mayonnaise consistency. Install the fasteners with just enough force to hold the hardware in place until the epoxy cures.

Bonding anchor bolts

One of epoxy's best uses is to bond anchor bolts into concrete. The principle is the same as for wood. Drill an oversized hole. Wet out the hole with epoxy. Then place the bolt or threaded rod in the hole.



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It's a good idea to put a nut on the threaded rod so that its top is barely above the surface **(24)**. This centres the rod in the hole and will help to reduce the creep load on the epoxy when the hardware item is tightened down.

Blending epoxies

Advanced users can blend G/flex 650 Epoxy Adhesive with WEST SYSTEM 105 Resin-based epoxy combinations to modify toughness, flexibility, cure speed, viscosity, strength, and elongation. The epoxy blend will have properties/characteristics derived from both epoxy systems, roughly in proportion to the percentage of each epoxy in the blend.

Blending WEST SYSTEM 105/205 with G/flex 650 will speed up the cure of G/flex, lower its mixed viscosity and increase rigidity of the cured epoxy, compared to using G/flex 650 alone.

To blend G/flex 650 Epoxy Adhesive with 105 Resin-based epoxies, you must meter the appropriate resin to hardener mix ratio of each epoxy prior to blending the two combinations together.