



G/flex.

655 Instructions

A guide for using G/flex 655 Epoxy Adhesive

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 655 is a high-strength epoxy designed for permanent, water-proof, structural bonding. G/flex has a modulus of elasticity of 150,000 psi, 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, lpe, teak, greenheart, purpleheart and black walnut to name a few. G/flex can glue damp woods, be used on wet surfaces and even underwater when applied with specific techniques.

In addition to wood, G/flex is ideal for bonding a variety of materials including dissimilar ones—metals, plastics, glass, masonry, and fiberglass.

We encourage you to experiment with G/flex. We think you will find many projects for which special properties of G/flex are ideally suited. As always, our Technical Staff is available to answer your questions, and is eager to hear about your projects and repairs using G/flex Epoxy. Call 866-937-8797 (toll free).

Safety

- Avoid skin contact with resin, hardener or mixed adhesive. Wear liquid-proof gloves and 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 vapors. 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

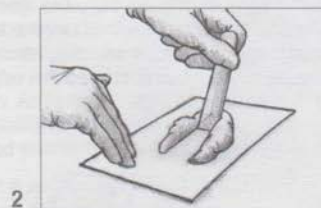
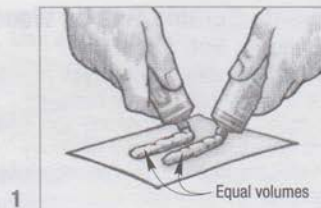
Puncture the seal in each tube with the point in the end of the cap.

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 655 Resin and Hardener onto a mixing pallet (1). Use the square end of a mixing stick to thoroughly blend the resin and hardener (2).

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 655 Epoxy Adhesive 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 (10°C) increase in temperature.

G/flex 655 will cure in temperatures as low as 40°F (4°C), but cure very slowly. When using 655 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 655 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 with a waterless cleaner, 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 mold 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 655 Epoxy Adhesive can be used to bond damp and wet surfaces (see Gluing to wet surfaces and surfaces underwater, 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 655 Epoxy Adhesive and immediately scrub metal surfaces through the wet epoxy coating with a fine wire brush or sandpaper.

Adhesion to aluminum can best be improved by treating it with a two-part aluminum etch kit prior to applying the epoxy. Aluminum can be prepared using the "abrade through wet epoxy" method with good results if an aluminum 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 12 to 16 inches 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 bonding surfaces with 80-grit parallel to the grain. Clean oily woods with a solvent such as acetone, lacquer thinner, or isopropyl alcohol. 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 655 Epoxy

Adhesive, with proper surface preparation, approached the grain strength of the wood in all of the woods we tested.

Bonding

Apply the epoxy mixture to all properly prepared mating surfaces. Apply enough epoxy to fill voids and bridge gaps on uneven mating surfaces.

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

Surface Preparation for Various Dry Materials

Material	Basic Preparation	Additional Surface Preparation	
Fiberglass laminate	As necessary, Remove soft and loose surface material		
Aluminum		Two-part aluminum etch	
Steel	Remove contamination with solvent wipe	Wire brush through wet epoxy	
Steel-galvanized			
Copper			
Bronze			
Lead			
Ipe	Sand with medium-grit sandpaper	Isopropyl alcohol wipe	
Teak			
White oak			Sand with 80-grit parallel to grain
Walnut			
Purpleheart			
Greenheart			
ABS plastic	Isopropyl alcohol wipe	Flame treat	
PVC plastic			
HDPE, LDPE plastic		Flame treat required	
Polycarbonate (Lexan™)	Sand with 80-grit		

bonding strength. Allow the epoxy to cure thoroughly before stressing the joint.

Use a spreader or notched trowel to apply G/flex 655 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.

Bonding 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 under water surfaces is possible.

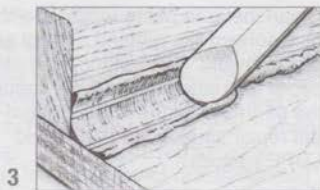
Abrade bonding surfaces with 80-grit sandpaper.

Mix an appropriately sized batch of G/flex 655 Epoxy Adhesive. Forcefully apply the 655 on to the bonding surfaces with a plastic spreader or stiff brush to displace water in the scratches and pores at the bonding surface.

Bring the mating surfaces together and apply just enough clamping pressure to squeeze out excess 655 and moisture. Allow to cure 7–10 hours before removing clamps and 24 hours before stressing the joint.

Making Fillets

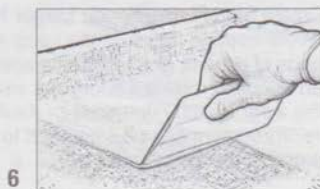
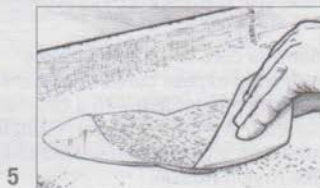
When parts are joined at or near right angles, fillets can be used to add considerable strength to the joint by increasing the surface area of the bond. Make fillets by applying a bead of G/flex 655 along the inside corner of the joint. Form the epoxy into a cove section using the round end of a mixing stick (3).



Clean off the excess epoxy with the beveled end of the mixing stick before the epoxy gels (4).

Fiberglassing

Light weight fiberglass fabrics and tapes (4–9 oz/sq yd range) can be used with G/flex 655 Epoxy Adhesive when fiber 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.

Coat the substrate with 655. 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. ■

Reliable WEST SYSTEM® Epoxies

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.

Since 1969, 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 ensure 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 westsystem.com.

Further assistance can be obtained by contacting the friendly and knowledgeable **Technical Staff**. Call 866-937-8797 (toll free).

Because Gougeon Brothers Inc. cannot control how its products will be used, it makes no warranties, either express or implied, including no warranties of merchantability and fitness for purpose intended. Gougeon Brothers Inc. will not be liable for incidental or consequential damages.



Gougeon Brothers Inc., Bay City, MI 48706
866-937-8797 / westsystem.com
©2014 Gougeon Brothers, Inc. M0614 R60-409