

655 Epoxy Adhesive General Use

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 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 top of the cap. Enlarge the opening as necessary to improve flow.

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 and clothes with alcohol, 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 alcohol, citrus-based cleaner or a solvent such as lacquer thinner or acetone.

Basic surface preparation

G/flex 655 Epoxy will bond to many different materials. For best adhesion to most materials, bonding 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 solvents as they may contaminate the surface with fabric softener residue.

SANDED—Sand non-porous and smooth surfaces with 80-grit aluminum oxides and paper to provide good texture for the epoxy to “key” into. Brush away sanding dust. Refer to the chart (*right*) for recommendations.

DRY—Although G/flex 655 Epoxy can be used to bond damp and wet surfaces, 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 and immediately scrub metal surfaces through the wet epoxy coating with a fine wire brush or sandpaper.

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 solvent such as isopropyl alcohol or acetone. 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, with proper surface preparation, approached or exceeded 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
Fiberglass laminate	As necessary, Remove soft and loose surface material	Abrade with 80-grit sandpaper
Aluminum		
Steel		
Steel-galvanized		
Copper		
Bronze	Remove contamination with solvent wipe	Wire brush through wet epoxy
Lead		
Ipe	Sand with 80-grit sandpaper	Isopropyl Alcohol wipe
Teak		
White oak		
Walnut	Sand with 80-grit sandpaper parallel to grain	Isopropyl Alcohol wipe
Purpleheart		
Greenheart		
ABS	Isopropyl Alcohol wipe	Flame treat
PVC	Sand with 80-grit	Flame treat required
HDPE, LDPE plastic		
Polycarbonate (Lexan™)	Sand with 80-grit	

Plastics

Clean plastics, except for polycarbonate, with isopropyl alcohol to remove contamination. Sand all plastics including polycarbonate with 80-grits and paper to provide texture for good adhesion. Flame treat ABS and PVC for additional benefit.

HDPE (high-density polyethylene) and LDPE (low-density polyethylene) must be flame treated for good adhesion.

FLAME TREATING is a method for improving adhesion to plastics by quickly passing the flame of a propane torch across the surface after it is cleaned and sanded. Allow the blue part of the flame to touch the surface. Keep it moving at the rate of 12 inches per second.

No obvious change takes place, but the flame oxidizes the surface and dramatically improves adhesion. Make multiple passes of the torch ¾" apart to treat wide areas. Be careful not to melt or burn the surface.

While flame treating will improve adhesion to most plastics, it appears to provide the greatest benefit to polyethylene (HDPE and LDPE). If you are unsure of the type of plastic, it doesn't hurt to flame treat. ■

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 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 underwater 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 onto 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 adhesive and moisture.

If one bonding surface is dry, apply extra adhesive to it, so excess will displace water at the bonding surface. It is important that significant excess adhesive squeezes from the joint for proper bonds to form.

Gluing things to plastic boats

G/flex 655 is a toughened epoxy adhesive designed to bond to many different materials in addition to plastic. Joint strength—the ability to adequately transfer a load from one part, one material, to another—depends on the combined effects of three factors.

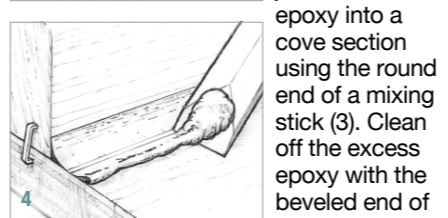
GLUE STRENGTH—Careful metering and thorough mixing will assure the epoxy adhesive mixture cures to full strength.

Allow to cure 7–10 hours before removing clamps and 24 hours before applying a load on 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 re-inforcement 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 on to the fabric using a plastic spreader. When the fabric and substrate have been saturated, use the spreader to smooth and remove excess epoxy. Repeat the process with additional layers. ■

ADHESION—For the best adhesion, the joint's bonding surfaces must be properly prepared. Refer to the chart on the left for the proper surface preparation for the plastic and the material you are gluing to it.

JOINT AREA—The bonding area of the joint must be adequate for the load on the joint and materials being joined. Increased overlap, scarf joints, fillets and reinforcing fibers can be used to increase the joint bonding area.

G/flex 655—a WEST SYSTEM® Epoxy

G/flex 655 Epoxy is the result of years of experimentation to develop a toughened epoxy that was simple to use, viscous enough not to drain out of a joint, and would adhere tenaciously to a variety of materials under difficult conditions.

G/flex 655 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 655 is, first of all, a high-strength epoxy—designed for permanent, waterproof, structural bonding. Further more, G/flex has a modulus of elasticity of 150,000 psi, giving 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 and even has the ability to glue damp woods.

G/flex is ideal for bonding a variety of other materials, including dissimilar ones—metals, plastics, glass, masonry, and fiber-glass. It can be used to wet out and bond fiberglass tapes and fabrics.

We encourage you to read these instruction and then experiment with G/flex. We think you will find many projects for which the particular properties of G/flex are ideally suited.

West System reliability

G/flex 655 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.

WEST SYSTEM is the worlds leading brand of marine epoxy, created by Gougeon Brothers—sailors, boatbuilders, and formulators who literally wrote the book on wood/epoxy boat building. We know the engineering and chemistry required to formulate epoxies for high-performance composite structures. It requires thorough research, rigorous test programs, skillful shop work and direct experience with today's high-performance boats and other engineered structures. This experience and dedication to performance has given WEST



SYSTEM another quality that sets it apart from other brands of epoxy.

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, everytime. This commitment to quality has earned certification to the ISO9001:2008 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.

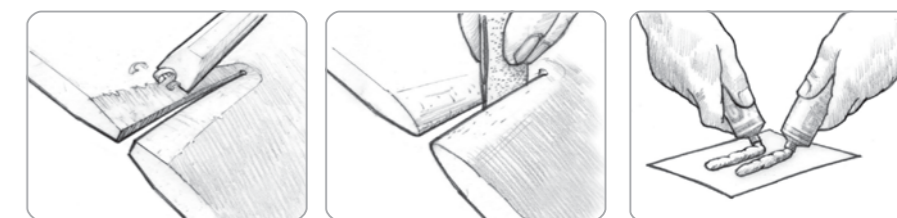
The WEST SYSTEM website provides basic product information, dealer locations and links, project articles and galleries, and safety information. Visit westsystem.com.

Further assistance can be obtained by contacting the friendly and knowledgeable Technical Staff. Send e-mail to tech-support@westsystem.com or call **866-937-8797** (toll free).

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655-K

PLASTIC BOAT Repair Kit



Repair plastic boats

Step-by-step instructions show you how to use the materials in this kit to repair splits, cracks and small holes in plastic canoes, kayaks and other small boats.

Tools required

In addition to the materials in this kit, you will need a propane torch, a sabre saw or hack saw, scraper or chisel, clamps, 80-grit sandpaper, 2" wide packaging tape, plastic spreader, paper towels, color matched plastic-compatible paint and laquer thinner or acetone as necessary for clean up.

Repairs requiring additional materials

With the addition of 4–6 oz. fiberglass or Kevlar™ fabric and a plastic spreader, you can create abrasion resistant surfaces on worn stems and bottoms and repair larger holes. Instructions are included.

Repairs to inflatable boats

Patch air leaks, re-bond attachment points, repair delaminated transoms and damaged floors. Instructions are included.

Finishing

G/flex Epoxy is compatible with Krylon® Fusion™ or Rust-oleum® Universal All Surface™ paint to match existing finishes.

Kit contents

4.2 fl. oz. G/flex 655-A Resin, 4.2 fl. oz. G/flex 655-B Hardener (9 fl. oz. mixed epoxy), 2 reusable mixing sticks/applicators, 2 pair disposable neoprene gloves, mixing palettes and complete handling and repair instructions.

WARNING IRRITANT. POSSIBLE SKIN SENSITIZER. May cause irritation to eyes and skin. May cause allergic reaction. Avoid skin and eye contact. Do not ingest. Use with adequate ventilation. Use with liquid-proof gloves, eye protection and protective clothing.

FIRST AID: SKIN CONTACT—Immediately wash with soap and water. **EYE CONTACT**—Immediately flush with water for at least 15 minutes. Consult physician. **INHALATION**—Remove to fresh air. Consult physician if coughing or irritation develops. **INGESTION**—Do not induce vomiting. If conscious, give 2 glasses of water. Get immediate medical attention. **KEEP OUT OF REACH OF CHILDREN**

655-A RESIN CONTAINS: bisphenol-a epoxy resin, bisphenol-f epoxy resin, amorphous silica. **655-B HARDENER CONTAINS:** ATBN polymer, aminoethylepipiperazine, tris-2,4,6-(dimethylaminomethyl)phenol, triethylenetetramine, phenol 2,4,6-tris[(dimethylamino)methyl] reaction products with triethylenetetramine, phenalkamine curing agent, cashew nutshell liquid, 1,3-benzenedimethanamine, amorphous silica.



SCAN FOR VIDEO

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