



**Tech-Bond Global**

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## White Paper

### Why Tech Patches are so effective as a patch on a damaged gas tank.

**Tech-Patches are PTFE (Teflon) coated e-glass fabric.** The patches combined with the Polymer Bonding Process (Process) repair damaged gas tanks, both plastic and metal, because of a few very unusual material properties that line up perfectly with being used to keep gas where it belongs ... contained. What a Tech Patch does is it to keep aggressive liquids/vapors in the tank while surviving the outdoors and thermal cycling.

#### Why the PTFE coated e-glass fabric is so effective:

- **Extreme chemical inertness.** The carbon–fluorine bond is one of the strongest in organic chemistry, so gasoline components (aromatics, ethanol, additives), acids, bases, salt spray, etc. **don't attack or dissolve** PTFE.
- **Very low surface energy (~18 mN/m).** Liquids don't wet it easily. Gasoline and water tend to **bead and won't wick** through micro-paths—huge for stopping undercutting at patch edges.
- **Low permeability to hydrocarbons.** Compared with most plastics, PTFE is an excellent **barrier** to fuel and many solvents, reducing vapor creep through the patch.
- **Wide service temperature.** Works from very cold to ~260 °C continuous without getting brittle or soft—handles day-night and process swings.
- **UV/oxidation proof.** Sunlight and weathering barely affect it, so outdoor service life is strong.
- **Low friction, non-stick.** Dirt and deposits don't adhere easily, which helps long-term cleanliness and edge integrity.

#### Why plain PTFE is tricky (and how you solve it)

- **It's notoriously hard to bond.** That same low surface energy that repels fuel also repels **adhesives**. Conventional epoxies “sit on” PTFE and let go under stress.
- **Creep (“cold flow”).** PTFE alone can deform slowly under load.

**The Tech Patch Repair System (TPRS), the Tech-Patches and Tech-Wraps** addresses both of these issues by using **PTFE-coated E-glass fabric** applied to the damaged tank through a controlled **Polymer Bonding Process**:

- The **E-glass** provides **mechanical reinforcement** (strength, dimensional stability) so the patches and wrap do not “creep”.
- The **PTFE layer** gives the **chemical barrier** and anti-wicking surface that fuel can't undercut.
- Your **Process** (surface activation/prep → thin adhesive → catalyst window → gentle heat) creates a **true bond line** to substrates—including hard ones like HDPE and steel—so the patch becomes an integrated overlay rather than a brittle glue slab.

### **Net effect in the field**

- **Fuel/vapor don't attack the patch** or sneak underneath it.
- **Edges stay sealed** because liquids can't wet the PTFE surface easily.
- The **bond** rides out vibration and thermal cycling.
- **Outdoor durability** is excellent (UV, salt, temperature has little or no effect on the bond or on the PTFE coated e-glass fabric).

So, PTFE “works so well” because it's a **chemically inert, low-energy barrier**—and when you pair it with glass reinforcement and a bonding process designed for low-energy plastics, you get a thin, tough, fuel-resistant repair that holds up where epoxies and fiberglass alone don't.