



RELTEK LLC

adhesives, sealants & coatings for harsh environments

Flame Etch Application Instructions

The basic concept

The concept is the hydrogen atoms in poly-olephin plastic (hydrocarbon molecular chains) will react with the ingredients of propane gas when the gas is in the initial stages of oxidizing—burning in the presence of oxygen from the air. When the oxidizing chemical reaction initiates the propane is clear and goes to a blue flame; in this process it is highly reactive with substrates and that is the region used to etch the plastic. When the gas is in the late stage of oxidizing it emits a yellow color which appears at the outer limits of the flame envelope and has very little reactivity, and is very hot.

It's important to realize it's not the heat that causes the plastic to etch; it's the highly reactive propane gas in the initial stage of oxidizing that causes the etching. Hence, high heat is not needed nor desired in the flame etching procedure.

Figure 1





Figure 2



Application instructions

1. Using 100 or 120 grit medium sandpaper, aluminum oxide paper, or grit blast abrade all surfaces evenly to remove gloss finish on the plastic.
2. Wipe all surfaces clean with isopropyl alcohol. Allow alcohol to evaporate—its extremely flammable so as a safety precaution do not apply the flame with alcohol on the surface or in the vicinity of the flame.
3. Using plain inexpensive propane gas, like for camping stove or lantern (not map gas, acetylene, or other such gases) light a propane torch and set the flame to a very low volume, soft blue color, with no yellow in the flame. With the correct setting the flame should be all blue in color and a “clear” spot will be evident within the center of the flame. See Figure 1.
4. Position the torch nozzle so that the nozzle tip is $\frac{1}{4}$ to $\frac{1}{2}$ inch from the surface being treated and the clear zone of the flame spreads over the surface being etched, surrounded by the blue colored flame. See Figure 2.
5. Move the flame along the surface at approximately two (2) inches per second. A slightly glossed surface will appear under the flame. Keep moving so the plastic doesn't get too hot and melt or warp when cooling.
6. The surface is now ready to apply the BONDIT adhesive or primer. The etched surface is usable for approximately one week with no loss of adhesive strength. After that repeat the instructions in full.