



FIXTURES FOR TRIMMING OF PLASTIC PARTS



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SUGGESTED PROCEDURE FOR THE FABRICATION OF FIXTURES FOR TRIMMING PLASTIC PARTS

There are several methods of creating stable, economical fixtures for trimming of plastic parts. There is one method, however, which attracted our attention years ago and, to date, exceeds all other methods to which we have been introduced. This method is not only economical and dimensionally stable, but also is the most error-proof method of eliminating damage to the plastic part. This style of fixture is historically named "Thermwood" after a recognized name in trimming of vacuum formed parts. In its simplest form, the part being trimmed is held on by vacuum vs. clamps or other mechanical means. Historically, this fixture is formed out of wood or machined from Model Plank, Die Plank, metal, plastic, etc., with a rubber seal surrounding the vacuum area to shut off air leakage.

INSTRUCTIONS FOR BUILDING FIXTURE

Visualize a plastic part to be trimmed. This can be as large as an airplane fuselage or as small as a blow-molded hose for a hydrometer.

1. Position the surface to be fixtured in a face-up position.
2. Apply a mold release, such as ADTECH MR #1 or another which will not attack urethanes or the part to be fixtured. Refer to the Product Data Bulletin for proper application of MR #1 Mold Release.
3. Brush on to this released surface the TCC flexible urethane of your choice, determined by the amount of flexibility and abrasion resistance you require. For instance, TCC-6000A/TCC-6065B (65 Shore D) is most commonly used for high-production inner door automotive panels. Whereas TCC-5000A/TCC-5050B, a softer material at 50 Shore A, is required for highly textured blow-molded parts to offer a seal. Allow this first surface coat to tack-up (tested by the fingerprint test). Paint on a second surface coat, and allow to tack. Laminate two or three layers of fiberglass cloth (usually Style #7500 10oz is suitable) with ADTECH laminating resin. For temperature resistance, a high-temp system such as EL-337 may be required. For most room-temp trim fixtures, EL-301 from ADTECH is suitable. Being unfilled, this system wets out very well while entrapped air is easily seen and eliminated.
4. We then pack on tooling compound, eliminating the traditional laminating schedule, thus reducing weight and the cost of both material and labor. For high-temp fixtures, use ADTECH EL-325 HTTC. Room-temp fixturing is best facilitated with ADTECH EL-323 TC. This core of tooling compound is normally 1/2" thick with corners and ridges slightly thicker for strength where required.
5. A balanced lamination is applied to the back of the core (tooling compound). We now have, once cured and demolded, a rigid nest with a flexible face for sealing off the vacuum. A vacuum chamber or "box" is then laminated to the back of this fixture. Properly designed, this "box" also becomes the stand or base for this fixture.
6. Holes are then drilled through the fixture face into the vacuum chamber, generally 1/8" diameter, and 1" to 2" center-on-center. The number of holes and their diameter is determined by the CFM required to hold the part and the flexibility of the plastic material being held. Generally, many small holes are better than a few large holes.

7. To plumb the box to your vacuum source, a pipe flange can be attached to the side of the chamber with a corresponding hole drilled through the chamber wall at the pipe flange location. The flange and hole size should be large enough to immediately evacuate the chamber; generally, 3/4" is ample.
8. Sealing the box joints, corners, flanges and base can easily be accomplished by painting the suspect areas with the same urethane used to face or surface your fixture. Now the part can be placed on the fixture and, with vacuum activated, is firmly held for trimming. Do you need a trim edge also? No Problem! Cut the fixture to the shape and size required for trimming. Adtech also manufactures ES-204SC silicon-carbide filled surface coat for room-temp applications, and ES-225 aluminum enriched high-temp surface coat for high-temp applications.
9. Once the edge of the fixture is shaped to the time line, paint the ES-204SC silicon-carbide filled surface coat, on the edge of your fixture. Allow to tack and apply a second coat (for good measure). Once cured, you have an edge on your fixture which is most abrasion resistant and will give years of service as an edge upon which the bearing for your router bit will ride.

Note that not all parts accommodate this technique. However, the holding power of this type of fixture is significant. Normal clamping devices are expensive to construct and may result in damage to the part. This type of fixturing also works well for heat-staking, drilling, checking, etc.

PLEASE REFERENCE THE FOLLOWING PRODUCT DATA BULLETINS

ADTECH EPOXY LAMINATING SYSTEMS: EL-301 / EL-337

ADTECH EPOXY SURFACE COATS: ES-204SC / ES-225

ADTECH EPOXY TOOLING COMPOUND: EL-323 TC / EL-325-HTTC / EL-325-1 HTTC

TCC URETHANES: TCC-6000A/TCC-6065B / TCC-5000A/TCC-5050B

MOLD RELEASE: Mold Release MR #1 / Mold Release MR #10

FIBERGLASS CLOTH: Style #7533 6oz / Style #7500 10oz / Style #7587 20oz

TCC TOOLING PLANKS: MP-1055 Model Plank / DP-1051 Die Plank / MP-1075 Intermediate Temp Model Plank