

Polyester Thermoplastic Elastomer

Vibration Welding

DuPont: Hytrel

For rigid parts with a large weld area, the preferred assembly method is vibration welding. As an example, the carbon canister used for automotive fuel vapor emission control is an ideal candidate. Since it is rectangular, spin welding is not practical; its large weld area precludes the use of sonic welding because of the need for a high energy source, and a hermetic seal is required. The type of vibration weld used in this case is linear, the cover plate and body moving relative to each other along an axis down the long centerline of the open end of the body. The flange which forms the weld surface is ribbed to maintain proper flatness during the welding operation. Clearance is allowed between the recessed portion of the cover and the inside of the body.

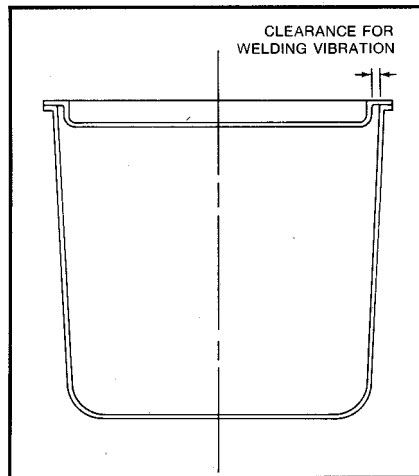


Figure 84.1: Automotive carbon canister design for vibration welding assembly using Du Pont Hytrel polyester thermoplastic elastomer.

Reference: *Hytrel Polyester Elastomer Design Handbook*, supplier design guide (E-52083-1) - DuPont Company, 1988.

Coining

DuPont: Hytrel

Coining can be used as an assembly method for Hytrel polyester thermoplastic elastomer. In this example, a housing is coined near the cover portion so that it can be permanently closed and sealed. The advantage of the coining method is that the coined section, though only one-quarter the thickness of the adjoining walls, has equivalent strength. This would not be true were the hinge area molded with a 1.38 mm [15 mil] wall.

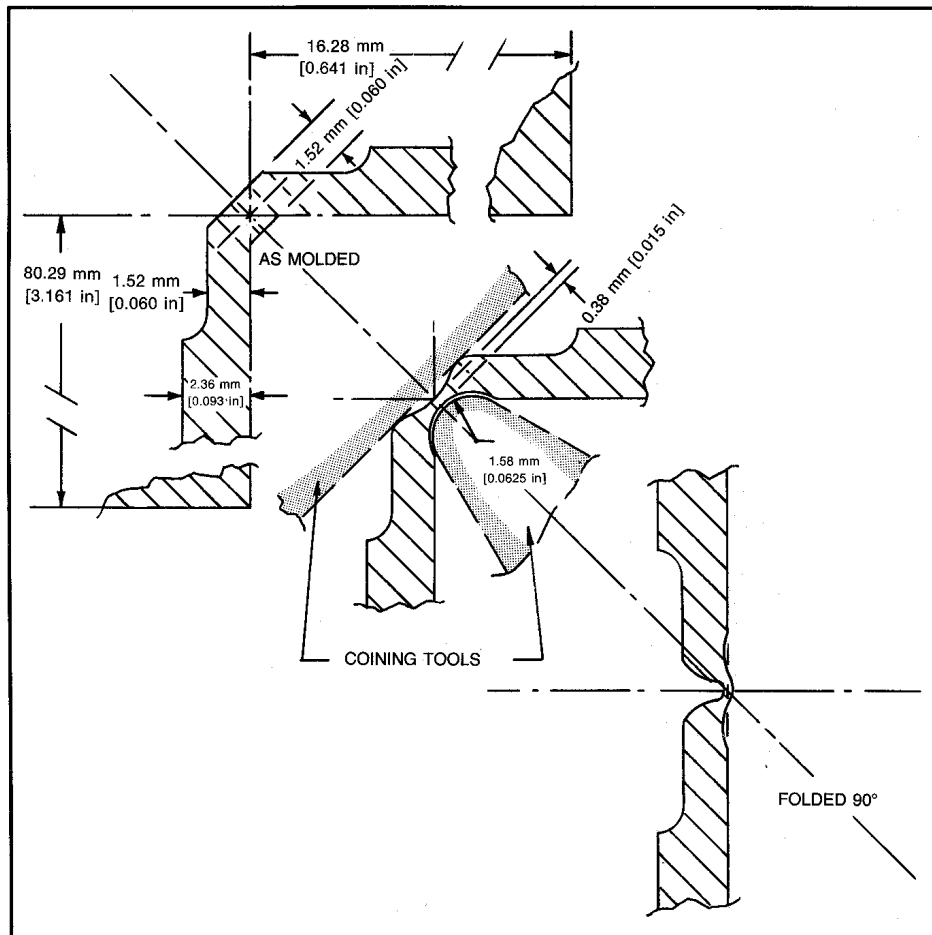


Figure 84.2: A coined hinge in Du Pont Hytrel polyester thermoplastic elastomer.

Reference: *Hytrel Polyester Elastomer Design Handbook*, supplier design guide (E-52083-1) - DuPont Company, 1988.

Ultrasonic Welding

DuPont: Hytrel

Sonic welding is a satisfactory way to assemble parts fabricated from the harder types of Hytrel. The design for an automotive valve component is a good example. The step joint is placed on the exterior of the lower part. The web of the lower part will then retain or support the diameter of the weld surface, and the mating weld surface on the upper part can be retained by an encircling fixture. This overcomes the possibility of the weld surface on the upper part distorting inwardly. This distortion, of course, could affect the weld strength. Make the axial length of the upper weld surface (2.03 mm [0.080 in]) greater than the axial length of the lower weld surface (1.9 mm [0.075 in]) to ensure that the parts will bottom out on the welding line.

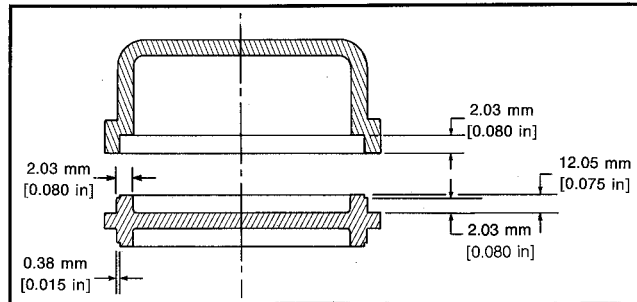


Figure 84.3: An automotive valve component designed for ultrasonic assembly using Du Pont Hytrel polyester thermoplastic elastomer.

Reference: *Hytrel Polyester Elastomer Design Handbook*, supplier design guide (E-52083-1) - DuPont Company, 1988.