Chapter 75

Polycarbonate/Polyester Alloy

Hot Gas Welding

Bayer: PC/Polyester

Results of this study indicated that satisfactory welds could not be achieved. With hot gas welding, the contractions that occur as the welds cool cannot be countered by maintaining pressure on the weld via the surrounding material, as is the case in many other plastics welding techniques. Hence contraction cavities and incomplete fusion at the joints are likely, and if the single V butt weld is used, then notches are produced in the root. The results are that welded sheets have low ductility and reduced strength, though the strength reduction is not great if optimum welding conditions are used. The impact properties too are inferior, particularly if impact occurs on the face of the weld. A double V butt weld improves the impact properties considerably.

The optimum air temperature for the polycarbonate/ polyester (PC/polyester) alloy was determined to be 353°C. The speed of travel of the welding gun and the pressure applied are determined by the operator who will be constantly adjusting these parameters to achieve a weld of satisfactory appearance. The appearance of the weld is a good guide to its quality: the smoothness of the profile and the nature of the wash are features deserving particular attention. The ratio of weld strength (tensile) to that of the parent material was 0.59 using a single V butt weld and 0.63 using a double V butt weld.

Reference: Turner, B.E., Atkinson, J.R., *Repairability of Plastic Automobile Bumpers by Hot Gas Welding,* ANTEC 1989, conference proceedings - Society of Plastics Engineers, 1989.