

Recycling Of Acrylic

Parts of acrylic can be fastened by chemical bonding, ultrasonic welding, and heat staking. Types of agents which are commonly used to chemically bond acrylic are solvents and polymerizable adhesives. Solvents like dichloromethane dissolve the surfaces of two acrylic parts, which harden after the solvent evaporates and bond to one another. Similarly solutions of acrylic polymer dissolved in a solvent or methyl methacrylate monomer work. Polymerizable adhesives which are two part contain a viscous acrylic resin base and a liquid catalyst that when mixed together provide a strong joint. Second type of bonding is through ultrasonic welding. It is an efficient method of fusing two parts made from the same material. Contact welding and transmission welding can be used for joining acrylic parts.

But, materials with different melting points are not good candidates for ultrasonic welding, since even a few degrees difference can result in one material melting before the other reaches its melting point, preventing a fusion between the parts. Fastening if done mechanically concentrates loads at fastening points and is not recommended for acrylic parts, as the act of drilling holes or torturing fasteners can introduce potentially damaging stress. Coring of holes is better rather than drilling them out. If wrong grade of acrylic is selected then it can lead to unsatisfactory results. In the recent days a manufacturer of a blood clot analyzer experienced early production problems with several complex parts molded from a general-purpose grade of acrylic. Initially chosen formulation led to parts developed stress cracks upon ejection from the tools, primarily because of complicated geometries that included sharp corners, edges, and points. Streaking also occurred. It was observed that additional toughness and impact strength were required, in a high-flow grade that would fill the molds. Gamma resistant acrylic was supplied in injection-grade pellets which solved some tricky molding problems. Tensile strength if high and impact resistance were critical as the parts are used in the assembly of a cassette intended to contain blood.

The containers must be resilient enough to resist cracking if accidentally dropped. Another consideration is dimensional precision. Next requirement was ultra violet transmission ability, which was necessary for curing the adhesive used in the cassette assembly. When molded from the impact-modified grade, the cassette parts have proven to be sufficiently durable, both during fabrication and in use. Acrylic material provides the requisite impact strength as well as a high degree of optical clarity and scratch resistance, and presents a pleasing, glossy surface finish. Disposal and recycling of acrylic has also to be considered. Burning of acrylic is extremely clean and provides virtually smokeless combustion with end products of carbon dioxide and water. Also the material offers superior recycle ability that is acrylic can be reground and reused, which results in less material waste during molding.

About the Author

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