

Amorphous Nylon

Welding

Huls AG: Trogamid (features: transparent)

Trogamid moldings can in principle be subjected to all known welding processes. For sufficient weld seam strength the achievement of a correspondingly high melt temperature in the joint area from about 260°C to 310°C is important. Owing to its amorphous nature and its melt toughness, the temperature range is not as critical as in the semicrystalline polyamides. It is important that the parts to be welded are dry for which reason assembly as soon as possible after shaping is recommended. Otherwise, the moldings are to be dried beforehand where drying times of up to one hour at 100°C to 110°C may be sufficient to remove the disturbing surface water.

Welding methods which can be considered are heated tool welding, vibration and spin welding, and ultrasonic welding. The heating or welding times as well as the joining pressure are part dependent and must therefore be empirically determined. In the ultrasonic welding process, close-and far-range welding are possible. Furthermore, Trogamid can be combined with Vestamid by ultrasonic welding. For good welding results in series manufacture, the observance of small dimensional tolerances in the joint area is very important. For directed energy transfer by the sonotrode, the execution of the joint plane in the form of a pinch-off weld or the use of an energy direction transmitter in the most varied designs has proven worthwhile.

Reference: *Huls Trogamid Polyamide 6-3-T*, supplier design guide (42.01.027e) - Huls Aktiengesellschaft, 1992.

Adhesive and Solvent Bonding

Huls AG: Trogamid (features: transparent)

Bonding of Trogamid moldings with each other and with other materials, e.g. metals, is possible if suitable adhesive or diffusion bonding agents are used. In particular, in adhesive bonds an improvement of the bond seam strength is achieved by scouring the joint faces (granularity 240) and subsequent degreasing. The joining pressure should be so dimensioned that an adhesive bonding film is preserved between the bonding surfaces. In laboratory tests a joining pressure of approximately 1 MPa has turned out to be beneficial. Epoxy resins, cyanoacrylates and polyurethane adhesives are recommended as adhesive bonding agents.

For diffusion bonding, dimethyl formamide (DMF) and concentrated formic acid can be used as solvents. Trogamid (10 - 20%) dissolved in these solvents has a crack-filling effect in uneven joint faces. Such adhesive solutions can only bond Trogamid with itself. With good bonding face pretreatment, tensile shear strengths of 20 MPa are achieved.

Reference: *Huls Trogamid Polyamide 6-3-T*, supplier design guide (42.01.027e) - Huls Aktiengesellschaft, 1992.