Machining

Welding

The following welding techniques have proved successful for the bonding of finished and semi-finished Elastollan parts:

Injection moulded parts are mainly bonded by **hot plate, ultrasonic** (harder types), **high frequency-** or **friction welding.**

For *semi-finished parts* and *profiles* **hot plate-** or **friction welding** is used as well as hot gas welding.

For *films* best results are achieved by **thermal sealing, heat impulse welding** or **high frequency welding**.

Decisive for the **weld strength** are: the **temperature** which enables below decomposition temperature a sufficient flow of Elastollan, and the **pressure** which generates the melt flow and sealing of the two layers. The pressure also provides stabilisation of the welding joint during setting time.

In all welding operations, provision must be made for the extraction of gases (see page 8, Health & Safety at Work).

Bonding

In order to facilitate bonding it is recommended to use Elastollan grades without lubricant. Polyurethane based elastic adhesives have proved successful in the bonding of Elastollan parts. Epoxy resin adhesive are used for bonding to metals and other hard materials.

Adhesives manufacturers offer suitable systems for this purpose.

The usual preparatory work should be undertaken before bonding.

Surface Finishing

Printing and painting are possible when lubricant-free Elastollan grades are used.

Suitable printing and painting systems are offered by paint and dye manufacturers.

Machining

Machining Parameters

Owing to the exceptional toughness and tear strength of Elastollan, machining is not without problems, and much depends on the hardness of the material to be machined. With all tools used for machining Elastollan, care should be taken to ensure that cutting edges are correctly sharpened.

In machining Elastollan, excessiv generation of heat should be avoided. Accordingly, always provide for cooling by compressed air or emulsion.

The following table gives recommended values for machining Elastollan:

Parameters for machining Elastollan

		Turning	Milling	Drilling	Grinding
Clearance angle	**α** [°]	6–15	~10	12–16	/
Rake angle	**γ**	up to 25	15–25	10	/
Setting angle	**x** [°]	45–60	/	/	/
Point angle	**δ** [°]	/	/	80	/
Cutting	speed	100–500	200–500	40–50	30–50 m/s
Rate of advance		0.1–0.4 mm/r	20–200 mm/min.	0.01–0.04 mm/r	max. ⅔ of grinding wheel width per tool rotation
Depth of cut	**a** [mm]	à 15	2–8	/	0.1–3
Centre radius	**r** [mm]	~0.5			
Tool		HSS, SS, HM	HSS, SS, HM		

Drilling: Hollow drill, twist drill, tooth face-milling cutter

Grinding: Grinding wheel with open structure and low hardness; high porous type (grain size 60 -80):

Table 8

Drilling

Drilled holes generally turn out to be smaller than the nominal diameter of the drill. For qualities up to 80 Shore A, the reduction in diameter is around 4–5%. As a rule, hollow drills produce holes with greater dimensional accuracy.

During drilling efficient cooling is recommended and the drill should be lifted frequently.

Machining

Turning

In order to reduce cutting forces and heat, tools used for turning should have smaller-diameter cutters than those used for metal.

Milling

Conventional milling machines and manual milling cutters may be used for Elastollan. Where cutter heads are used, in order to ensure good chip formation, the number of blades should be kept to a minimum.

Cutting

Cutting blades with close pitch and large setting are suitable.

Grinding

Elastollan parts may be ground.

Grinding wheels should not be too wide to prevent overheating at the grinding point (max. 20 mm). Cooling is advantageous and will permit a higher grinding speed.

Punching

The shape of the stamped surface will depend on material hardness. Fig. 27 shows the results of stamping of soft und hard Elastollan types.

Results of stamping

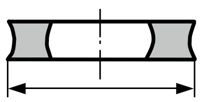
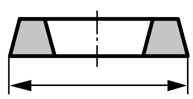
Soft	Hard
	

Fig. 27