General Recommendations

Storage

Elastollan is the protected trade mark of our thermoplastic polyurethane elastomers (TPU). These materials are used for injection moulding, extrusion and blow moulding.

The following recommendations should be observed in the processing of Elastollan materials.

Elastollan grades are supplied uncoloured, in diced, cylindrical or lentil-shaped form. The materials are hygroscopic i.e. dry Elastollan, when exposed to the atmosphere will rapidly absorb moisture. Polyether-based Elastollan grades absorb more rapidly moisture than polyester-based grades.

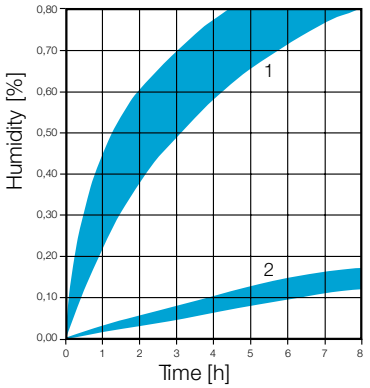
Figures 1 and 2 show the rate of moisture absorption.

Storage in dry conditions, if possible at room temperature, is therefore recommended.

In order to prevent condensation, material stored in cool conditions should be brought to room temperature before opening the container.

Containers should be tightly closed after use. The granulate should be exposed to the surrounding air only for as long as absolutely essential. It is therefore important to cover the feed hopper of the processing machine. Drying is recommended if the container has been opened several times.

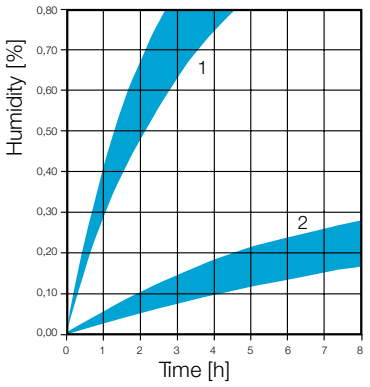
Moisture absorption
Polyester-TPU
Hardness 80 Shore A – 64 Shore D



1 – Standard atmosphere 40 °C/92% rel. hum.
2 – Standard atmosphere 23 °C/50% rel. hum.

Fig. 1

Moisture absorption
Polyether-TPU
Hardness 80 Shore A – 64 Shore D



1 – Standard atmosphere 40 °C/92% rel. hum.
2 – Standard atmosphere 23 °C/50% rel. hum.

Fig. 2

General Recommendations

Drying

Excessive moisture content in the granulate can lead to processing problems and to a reduction in the quality of the finished part.

Foaming of the plasticized material or the formation of gas bubbles in the melt are indications that the moisture content is excessively high. Variations in output during extrusion processing are in many cases attributable to insufficient pre-drying.

In order to ensure optimal performance properties in the finished Elastollan parts, it is necessary that the material is dried before processing. **Water content of the granulate should not exceed 0.02%.**

Conventional circulating-air ovens, vacuum drying cabinets and dehumidified air dryers are suitable for this purpose. For recommended drying parameters see table 1.

When using circulating-air ovens, the layer of granulate should not exceed 4 cm in height. With dehumidified air dryers, the total available capacity may be utilized. After drying, the granulate should be immediately stored in dry containers which can be securely sealed.

When colour masterbatches and additives are used, care must be taken to see that they are also dried. Therefore it is better to pre-mix with the granulate before the drying process to make sure that the whole product is dried.

Drying recommendations

Elastollan hardness	Drying time	Drying temperature	
		Circulating air	Dehumidified air
Shore A 78 to 90	2 to 3 hours	100 to 110°C	80 to 90°C
harder than Shore A 90	2 to 3 hours	100 to 120°C	90 to 120°C

Table 1

Drying diagram for Elastollan

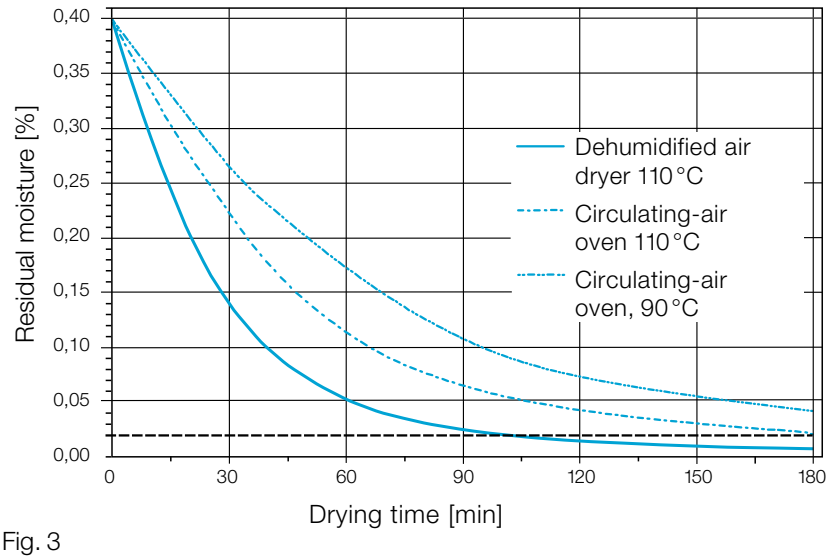


Fig. 3

General Recommendations

Colouring

All grades in our Elastollan range can be coloured. Masterbatches based on TPU are most suitable for this purpose. The normal level of addition of colour masterbatch is 2%, however, Elastollan grades containing pre-included additives, e.g. flame retardant types, may require a high loading to achieve the full depth of colour.

There is a risk that non-Elastollan-based colour masterbatches will prove incompatible with Elastollan grades. Poor pigment dispersion and a lack of colouring strength, as well as poor surface finish and possible loss of quality may result.

Additives

Various additives can be used to enhance the properties of Elastollan materials. Following additives supplied as Elastollan masterbatches are available:

- Anti blocking agents
- Release agents
- UV stabilizers

Use of Regrind

Depending on finished parts quality requirements, up to 30% of regrind can be recycled with virgin material. The material type and Shore hardness of the regrind should be identical to that of virgin Elastollan and has be free of contaminations.

Ideally, regrind should be diced, dried and re-used without intermediate storage.

Material which has been contaminated or degraded is not suitable for reprocessing.

Continuous recycling of regrind can lead to a reduction in the quality of finished parts. Certain quality requirements laid down in specifications may exclude the use of regrind material.

General Recommendations

Post-treatment

Moulded Elastollan parts require several weeks storage at room temperature to attain full mechanical properties. To achieve optimal functional properties in a shorter period, **annealing** of the finished parts is necessary. This heat treatment can be undertaken in a circulating-air oven.

Table 2 shows typical values for cured vs uncured Elastollan grades.

During annealing articles with low dimensional stability should be stored in such a way that deformation is avoided.

Extruded parts are annealed only in special cases.

Annealing:
Recommended duration and temperature: 20 hours at 100 "C

Effect of curing on Elastollan properties						
Properties	Unit	DIN	Cured 20 h 100 °C	Uncured 20 h 23 °C	Uncured 7 d 23 °C	Uncured 35 d 23 °C
				Elastollan C 90 A 55		
Hardness	Shore A	53505	91	91	92	92
Tensile strength	MPa	53504	48	42	44	46
Elongation	%	53504	580	570	550	500
Tear strength	N/mm	53515	98	80	83	85
Abrasion	mm^3	53516	22	54	30	29
Compression set at 70 °	%	53517	33	60	53	50
				Elastollan C 1190 A 55		
Hardness	Shore A	53505	90	89	91	91
Tensile strength	MPa	53504	48	43	45	46
Elongation	%	53504	550	560	530	500
Tear strength	N/mm	53515	85	74	73	79
Abrasion	mm^3	53516	19	48	34	27
Compression set at 70 °	%	53517	36	70	65	65

Table 2

General Recommendations

Health & Safety at Work

Depending on the grade used, Elastollan can be processed and machined over a wide range of temperature.

As with all natural or synthetic organic substances, decomposition is possible above certain temperatures. The rate of decomposition will depend on the temperature applied and the grade of material used.

Basically, onset of decomposition can be expected from temperatures of around 230°C upwards. Where elastomer melts emerge to the air, there is a possibility that the vapours released under such conditions will affect the workplace.

For this reason, an effective extraction system, especially in the melt outlet zone, is recommended.

Disposal

Elastollan materials are fully reacted and present no hazard to the environment. Waste can therefore be disposed at public waste disposal sites or refuse incineration plants. The official regulations on waste disposal should be observed.

For further information see our safety data sheets.