

# Technical Datasheet

## Sampo UNI 93A

PU 93 Shore A natural

**Sampo UNI** is a polycaprolactone-based thermoplastic polyurethane (TPU) developed primarily for processing via injection moulding.

**Sampo UNI** has excellent wear resistance and is well suited for high dynamic loads. The material is characterized by high elasticity and low compression set. Sampo UNI generally shows good chemical resistance, but for applications in hydraulic fluids, oil-water emulsions (HFA, HFB) as well as vegetable oils, the application temperature should not exceed 140°F.

**Sampo UNI** is characterised by the following features:

- Very good tensile strength, elongation at break and tear resistance
- Wide range of application temperature from -22°F to 230°F (depending on media)
- Hydrolysis resistance up to 140°F
- Good chemical resistance
- Suitable for turning, milling and grinding operations with very low tool wear

**Sampo UNI** is suitable for a wide range of thick- and thin-walled components and is used primarily in the following applications:

- Hydraulic and pneumatic seals of any kind
- Rolls and rollers
- Vibration and damping elements

## Sampo UNI / PU 93 Shore A natural

Product features	Value	Unit	Testing standard
Colour	white	---	---
Density	1200	[kg/m <sup>3</sup> ]	ISO 1183
Mechanical properties	Value	Unit	Testing standard
Hardness Shore A	93±2	[SHORE]	ISO 868
Hardness Shore D	47±3	[SHORE]	ISO 868
Tensile strength	≥7252	[psi]	DIN 53 504
Tear resistance	≥571	[lbf/in]	DIN ISO 34-1
Abrasion	27	[mm <sup>3</sup> ]	ISO 4649 A
Modulus 100%	≥1885	[psi]	DIN 53 504
Modulus 300%	≥3336	[psi]	DIN 53 504
Elongation at break	≥450	[%]	DIN 53 504
Compression set <sup>1</sup>	≤25	[%]	ISO 815
Compression set <sup>2</sup>	≤33	[%]	ISO 815
Thermal properties	Value	Unit	Testing standard
Min. operating temperature	-22	[°F]	---
Max. operating temperature	230	[°F]	---

<sup>1</sup> Testing parameters: 24h, 158°F, 25% deformation / <sup>2</sup> testing parameters: 24h, 212°F, 25% deformation

## Processing instructions for injection moulding of Sampo UNI

### Pre-treatment, drying

**Sampo UNI** is a hygroscopic TPU and therefore attracts moisture during storage. For this reason, it is recommended to dry the granules to a residual moisture content of ≤ 0.03% with a dry-air dryer before processing.

### Drying parameters (reference values)

Dew point: ≤ -40°F  
 Temperature: 176°F  
 Drying time: 3h

### Machine parameters

Feeding section: 77 – 104°F  
 Zone 1: 383 – 401°F  
 Zone 2: 401 – 410°F  
 Zone 3: 410 – 437°F  
 Nozzle: 437 – 455°F  
 Die/Mould: 68 – 140°F  
 Plastic melt: 437 – 455°F

Dosing volume: 50 – 80%  
 Injection speed: medium  
 Holding pressure: 60 – 90% P<sub>i</sub>

### Post-treatment, post-curing

Post-curing temperature: 248°F  
 Post-curing time: 16 – 24h

Note: the parts must be cooled to a minimum temperature of 104°F before taking out of the oven

**Barrel capacity:**

Avoid underutilization of the barrel wherever possible since it can lead to long residence times. Small shots run on a large capacity barrel complicate processing. The specifically best practice for any moulding is to utilize 40 % to 80% of the barrel capacity for each shot. This typically translates to 1,3 to 2,5 shots in the barrel.

**Shrinkage:**

Shrinkage is dependent on the geometry and processing parameters. Melt temperature and cooling rate impacts the shrinkage. The common range is between 1,5% and 2,2%.

**General notes:**

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