Synthene



TOUGH ISOTROPIC MATERIAL

SYNTHƎD+

PUprint

READY TO PRINT

DEVELOPED IN PARTNERSHIP WITH Lynxter

3D PRINTABLE · CHEMICAL RESISTANT · ABRASION RESISTANT · IMPACT RESISTANT · TEAR RESISTANT · FLEXIBLE













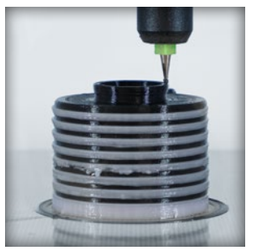


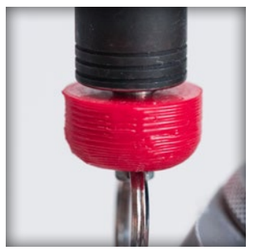












SYNTHƎD+ PUprint
A NEW GENERATION OF THERMOSET POLYURETHANE

- As strong as casting and injection PUs thanks to the chemical bonds between layers
- From soft to hard elastomers with four different hardness levels
- High thermo-mechanical resistance

Watch a short clip of the SYNTHƎD+ PUprint in action.

SOFT PARTS, PRINTED WITH EASE

- Four hardness levels from **55 to 80 Shore A**
- A reactive two-component (2K) liquid system **creating isotropic parts reliably**

STRONG & DURABLE

- Custom functional parts with **high mechanical toughness, abrasion resistance** and **fuel resistance**
- For **high-stress end-use parts** designed to **replace moulded elastomers** in demanding environments, without the lead time or cost of metal tooling

SUPPORT MATERIAL

- Possibility to add support material to make **more complex geometries**
- **Easily removable**

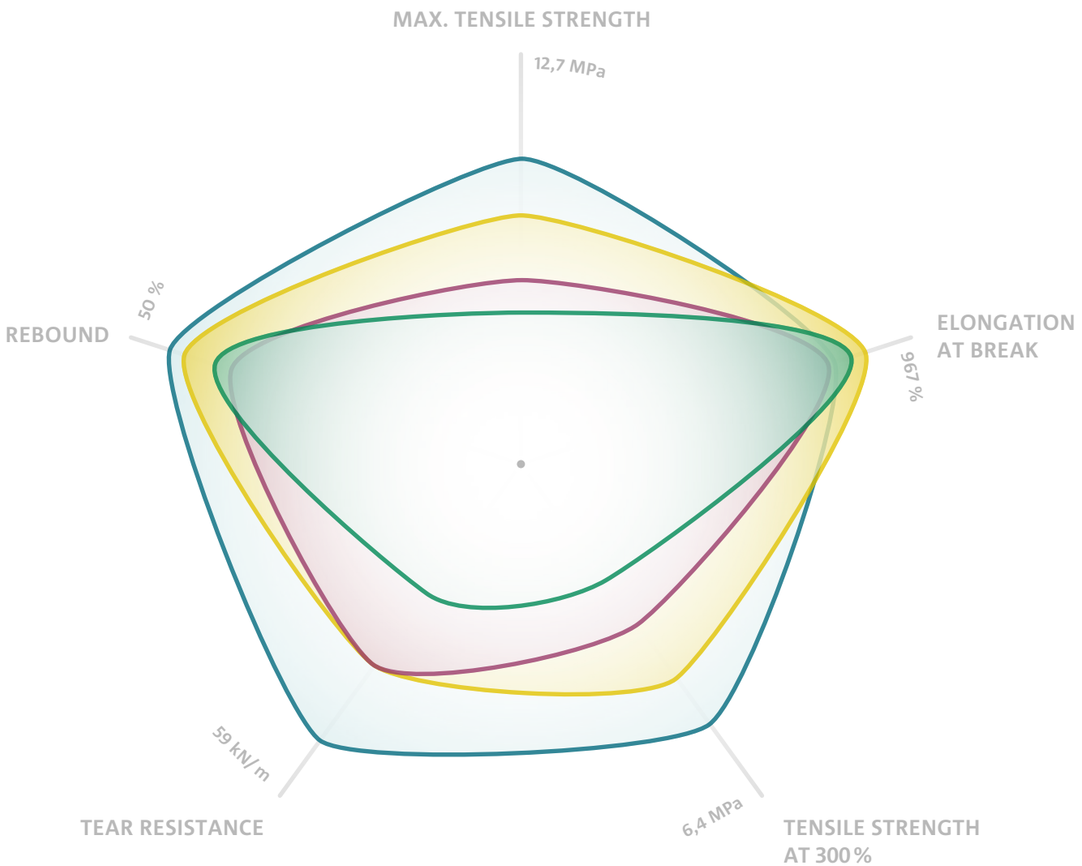
ALTERNATIVE TO TPU

- The **SYNTHƎD+ PUprint** uses Material Extrusion (MEX) to widen the possibilities on the market
- Its **isotropic properties** enhance the performance level versus traditional FDM printing

ALREADY IN APPLICATION

- First 3D printing machines for thermoset PU are **already in use** to print parts for cutting edges projects in sectors such as defence, aerospace, automotive and other industries with high-quality requirements

PUprint **55A**
PUprint **65A**
PUprint **70A**
PUprint **80A**



SYNTHƎD+ PUprint A HARDNESSES FOR EVERY APPLICATION

- **From soft to hard elastomers with four different hardness levels**
- **One Iso with four different Polyols for a simplified use**
- **By adapting the amount of infill, parts can be tuned in to exactly the needed properties**

55 SHORE A

- High elongation with excellent shape memory
- Fluid and gas tightness
- Best for seals, technical bellows and customized gaskets among other things

65 SHORE A

- This hardness offers a perfect balance between flexibility and structural tear resistance
- Best for soft robotic grippers, suction pads and damping buffers for moving parts among other things

70 SHORE A

- Engineered for heavy-duty industrial environments with high abrasion resistance and good fatigue endurance
- Best for custom silent blocks, elastic bumpers and shock absorbers among other things

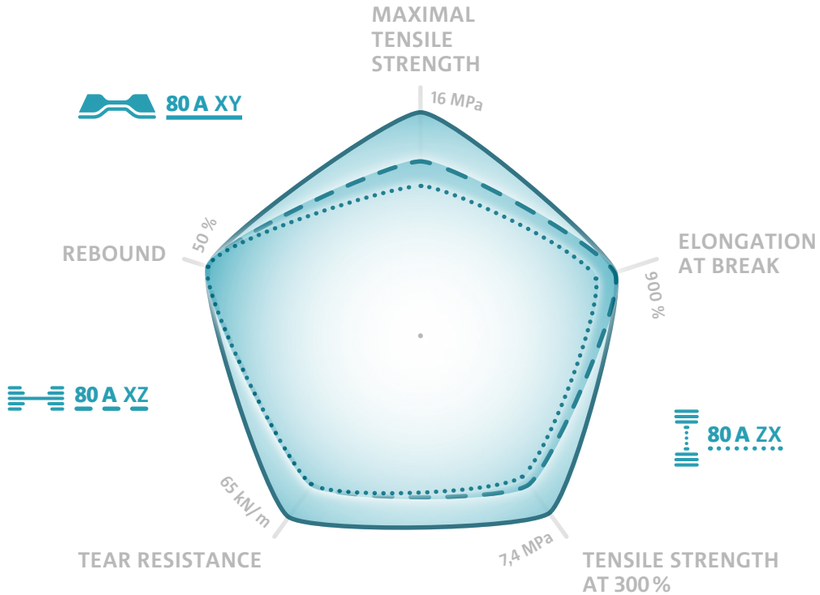
80 SHORE A

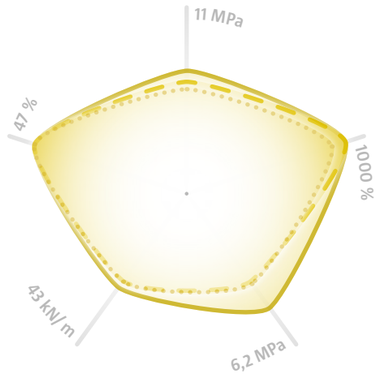
- A tough, harder elastomer capable of structural load-bearing while retaining dimensional stability
- Best for assembly fixtures and masking plugs for surface treatment among other things

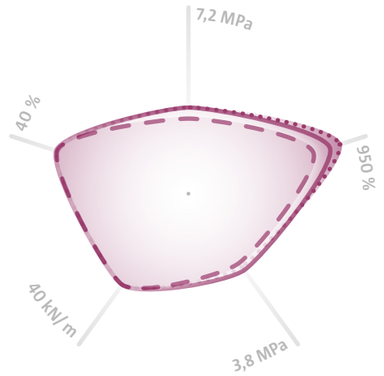
TECHNICAL DATA [1]

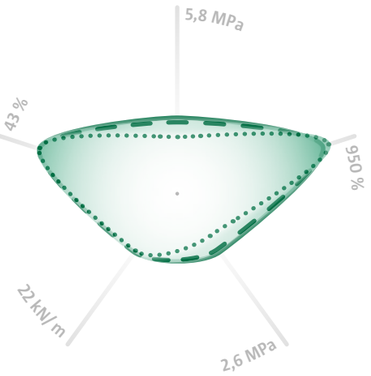
HARDNESS			PUprint 55A	PUprint 65A	PUprint 70A	PUprint 80A
Hardness	Shore A	ISO 868	55	65	72	80
Hardness at 80 °C	Shore A	ISO 868	47	62	65	77
Max. tensile strength at 23 °C	MPa	ISO 37-1	5,1	6,8	10	12,7
Elongation at break at 23°C	%	ISO 37-1	917	858	967	867
Tensile strength at 300 %	MPa	ISO 37-1	2,2	3,6	5,1	6,4
Tear resistance	kN/m	ISO 34-1	22	40	41	59
Rebound	%	ISO 4662	43	40	47	50

1 Average of the values for the 3 print axes









SYNTHƎD+ PUprint ISOTROPIC

- The cross-linking technology of thermoset PU offers the material structural integrity
- Performance across all three spatial orientations XY, ZX and XZ provides very good three-dimensional isotropy
- The material exhibits relatively uniform strength and elastic response on every axis

TECHNICAL DATA [2]

HARDNESS AND PRINT ORIENTATION			80A XY	80A ZX	80A XZ	70A XY	70A ZX	70A XZ	65A XY	65A ZX	65A XZ	55A XY	55A ZX	55A XZ
Hardness	Shore A	ISO 868	80			72			65			55		
Hardness at 80 °C	Shore A	ISO 868	77			65			62			47		
Max. tensile strength at 23 °C	MPa	ISO 37-1	16	10	12	11	9	10	7,2	6	7,1	5,8	4	5,4
Elongation at break at 23 °C [3]	%	ISO 37-1	900	800	900	1000	900	1000	875	750	950	900	950	900
Tensile strength at 300 %	MPa	ISO 37-1	7,4	5,7	6	6,2	4,7	4,5	3,8	3,4	3,6	2,6	1,7	2,4
Tear resistance	kN/m	ISO 34-1	65	52		43	39		40			22		
Rebound	%	ISO 4662	50			47			40			43		

2 The exact data are available in our TDS; the mechanical properties have been tested under specific conditions of curing and post-curing

3 Values measured without extensometer













NOUS FORMULONS VOS SUCCES
SINCE 1958

» **SYNTHENE**'s core activity is above all product **formulation and development**

» Our R&D laboratory formulates **tailor-made materials** to support your development projects

» **SYNTHENE**'s testing and production facilities **ensure high quality** from idea to delivery

HIGH EXPERTISE IN PU

» Polyurethane solutions for all types of parts **from soft to rigid,** for a lot of different production processes like hand casting, vacuum casting, 2-component mixing machine and 3D printing

» **SYNTHENE** emphasizes safer and more environmental-friendly formulas for a more **sustainable chemistry**

» At home in many industries: automotive, aerospace, construction, medical etc.

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