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PUprint SYSTEM

References :

Polyols:
PUprint 55-POLYOL-SY050000
PUprint 65-POLYOL-SY060000
PUprint 70-POLYOL-SY070000
PUprint 80-POLYOL-SY080000

Isocyanate:
PUprint 50-80-ISO-SY000940

Definition :

System of two-component polyurethane elastomers designed for manufacturing 3D-printed parts using material extrusion (MEX) technology. Compatible with **Lynxter S300X and S600D** 3D printers. Rubber-like materials with **55,64,72** and **80 Shore A** hardnesses.

	PUprint 55-POLYOL SY050000	PUprint 65-POLYOL SY060000	PUprint 70-POLYOL SY070000	PUprint 80-POLYOL SY080000	PUprint 50-80-ISO SY000940
Aspect - Colour	Green pasty liquid	Red pasty liquid	Black pasty liquid	Blue pasty liquid	Amber Pasty liquid
Density	1,09	1,11	1,13	1,11	1,06

Application properties :

	PU Print SYSTEM
Optimal printing settings	Consult https://hub.lynxter.fr/
Recommended print setting (nozzle)	0,69 mm
Recommended conditions in the printing chamber	20°C - 30°C / 10-30% R.H.
Recommended post-curing	16 -24 h at room temperature (23°C -10-30% R.H.) + 7 h at 40°C + 12 h at 100°C+ 24 h at 23°C

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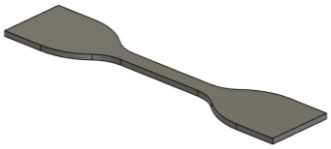
Average mechanical properties :

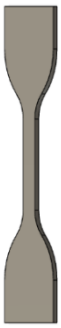
- **Average values obtained after curing: 24 h at room temperature (23°C -10-30% R.H.) + 7 h at 40°C + 12 h at 100°C+ 24 h at 23°C**

	Unit	Standard	Method	Values											
Hardness	Shore A	ISO 48-4	Durometer	**55**			**65**			**72**			**80**		
Hardness at 80°C	Shore A	ISO 48-4	Durometer	**47**			**62**			**65**			**77**		
Printing direction*				**XY**	**ZX**	**XZ**	**XY**	**ZX**	**XZ**	**XY**	**ZX**	**XZ**	**XY**	**ZX**	**XZ**
Maximum tensile strength at 23°C	MPa	ISO 37-1	50 mm/min 500 mm/min	5,8	4	5,4	7,2	6	7,1	11	9	10	16	10	12
Elongation at break at 23°C	%	ISO 37-1	50 mm/min 500 mm/min	900	950	900	875	750	950	1000	900	1000	900	800	900
Tensile modulus at 300%	MPa	ISO 37-1	50 mm/min	2,1	1,4	2,2	3,2	2,9	2,9	4,2	4	3,8	6,5	4,7	5,1
			500 mm/min	2,6	1,7	2,4	3,8	3,4	3,6	6,2	4,7	4,5	7,4	5,7	6
Tear resistance	kN/m	ISO 34-1	Type B	22	/	/	40	/	/	43	39	/	65	52	/
Rebound resilience	%	ISO 4662	Rebound Pendulum	43	/	/	40	/	/	47	/	/	50	/	/

» *** Printing direction :**



XY plane – flat orientation



ZX plane – upright orientation

XZ plane – side orientation

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Operating conditions with the S300X printer :

Hygiene and safety for using:

Wearing appropriate safety clothes and accessories (gloves, glasses) is advised.
Work in a ventilated room. For more information, please read the Medical and Safety Data Sheet of the material.

First use : Please refer to the tutorials section at https://hub.lynxter.fr/

Warning – Please read before any use of PUprint SYSTEM Polyurethane :

The isocyanate part PUprint-ISO-SY000940 may react with moisture, leading to partial curing of the liquid if it is directly and continuously exposed. To prevent this phenomenon and to ensure the lifetime of the LIQ21 pump, in case of extended machine downtime:

- **24 hours Downtime :**
  - Before complete machine shutdown : Leave the syringe currently in use, filled or partially filled, on the print head. Keep the already-used static mixer in place to plug the outlet of the print head.
  - Before machine restart : Check the correct mobility/rotation of the banjo fitting and, if necessary, disassemble it for cleaning. Remove the already used static mixer in order to extrude a minimum volume of 9 cc of PUprint 50-80-SY000940 isocyanate to remove any isocyanate that may have partially increased in viscosity. You can use the "load pump right" macro for this step.
- **7 days Downtime :**
  - Before complete machine shutdown : Leave the syringe currently in use, filled or partially filled, on the print head. Remove the static mixer and extrude a minimum volume of 9 cc of PUprint 50-80-SY000940 isocyanate to flush the stagnant material from the pump and replace it with fresh product. You can use the "load pump right macro" for this step. Then reinstall the already-used static mixer to plug the outlet of the print head.
  - Before machine restart : If the previous steps were not performed, it may be necessary to disassemble and clean the print head (LIQ21 pump) to ensure proper operation. The banjo fitting must be disassembled and cleaned, then its mobility checked. Recharge the pumps with fresh products before the pre-print operations. You can use the "load pump" macro for this step.
- **2 weeks Downtime :**
  - Before complete machine shutdown : Following the procedure available on the Lynxter Hub, disassemble the print head and clean the PUprint 50-80-SY000940 isocyanate side and all components in contact with the resin (pump body, banjo fitting, injection plate, etc.). Once all components are clean, dry and free of isocyanate residues, reassemble the parts and reinstall the print head on the machine.

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Connect a syringe of CA1603 cleaning agent and pressurize it (approx. 4 bar). Load the isocyanate pump with CA1603. Extrude approximately one third of the syringe, then stop the machine.

Two hours after shutdown, remove the mixer and extrude a minimum of 9 cc of CA1603 to flush stagnant material from the pump and replace it with fresh product. You can use the "load pump right" macro for this step. Repeat this operation two hours later. Then reinstall the already-used static mixer to plug the outlet of the print head.

- Before machine restart : Following the procedure available on the Lynxter Hub, disassemble the print head and remove any residual CA1603 cleaning agent and all components in contact with the resin (pump body, banjo fitting, injection plate, etc.). Reassemble the components and reinstall the print head on the machine.
  Check the correct mobility/rotation of the banjo fitting, then connect a new syringe of PUprint 50-80-SY000940 isocyanate. Pressurize both the isocyanate and polyol syringes and recharge the pumps with fresh product. You can use the "load pump" macro for this step.

1. Inspect the syringes prior to connecting them to the printhead. To ensure optimal dispensing performance, verify that the pistons move freely. In some cases, prolonged storage or traces of moisture can result in a light film forming between the piston and the isocyanate component, which may reduce piston mobility. If resistance is observed, gently free the piston using an appropriate tool and clean as needed before use.

2. To achieve the correct material properties, it is necessary to adjust the machine's mixing ratio to match the material's weight-based mixing ratio. A detailed procedure is available on the **Lynxter Hub**. A specific Excel sheet has also been created to perform the adjustments and calculate the correct mixing ratio; you will need to enter some parameters to generate the proper ratio calculation.

3. Then follow the calibration procedure document (for V1 users only) to achieve the correct mixing ratio for your print.

4. The build plate must be clean and free of any moisture. If needed, the build plate can be cleaned with a little amount of proper solvent (IPA or MEK). **Always make sure to apply a suitable release agent before starting a print**. We recommend using **Chemtrend PU 5438W**.

5. To ensure good print quality, the "macro" calibration step must be performed whenever the build plate, mixer or nozzle is removed or replaced.

6. A temperature between 20 and 30 °C and a humidity level of 10 % to 30 % inside the machine are strongly recommended to achieve optimal material performance.

7. Before starting a print :

- Load the STL file into the **Simplify 3D** slicer software.
- Use the updated FFF profile provided by Lynxter, to slice the print.
- Save the 3D model file to the printer from your computer.
- Ensure the syringes are properly connected to the print head and the air pressure connectors. Check that the air pressure on the machine is functioning for both components and set it to approximately 5 bars. **Be cautious when connecting the syringes to the air supply. If the syringes are not properly seated on the connector, it could damage the machine or pose a safety risk to the user.**

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You are ready to start a print :

- Select the desired file in the "File" tab on the printer screen. Follow the on-screen instructions and confirm. The mixer and nozzle will begin filling.
- A "babystepping" adjustment may be necessary to ensure the nozzle is close enough to the build plate for printing.
- The printing progress can be monitored directly from the connected computer or on the printer's display.

8. Once the print is finished, perform a 16-to-24-hour thermo-stabilization at room temperature with a relative humidity level between 10 and 30%, then the part can be removed carefully from the build plate. **Be cautious, parts are still fragile at this stage**. Then, Place the parts in an oven at 40°C to begin post-curing.

9. The final material properties are achieved after the following post-treatment: 24 h at room temperature (23°C -10-30% R.H.) + 7 h at 40°C + 12 h at 100°C+ 24 h at 23°C.

Packaging:

Consult us

Storage:

9 months in original and unopened vacuum bag, stored between 15 and 25 °C. Once the vacuum bag opened, we recommend using the material in the next 3 month.