AMERALABS

FLX-300

Flexible Elastomer

PERFECT FOR

- Flexible 3D prints
- Soft robotics
- Gaskets
- Vibration dampers
- Prototypes
- Custom-fit parts

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FLEXIBLE ELASTOMER

MATERIAL PROPERTIES

- EXCEPTIONAL SOFTNESS. Ultra-low Shore A hardness, which enables maximum elasticity and softness, is ideal for flexible applications requiring extreme deformation capabilities.
- HIGH ELONGATION. Superior stretch characteristics, combined with excellent bounce-back properties, ensure that parts return to their original shape after deformation.
- EXCELLENT COMPRESSION SET. Low compression set provides outstanding recovery after repeated compression cycles.
- LOW SHRINKAGE. No dimensional changes during the post-curing process, ensuring accurate part geometry.
- SMOOTH SURFACE FINISH. Non-tacky surface with minimal stickiness for comfortable handling and professional appearance.
- EASY POST-PROCESSING. Standard cleaning and curing procedures are identical to those of other AmeraLabs resins.
- LOW AGING. Maintains flexibility over time without hardening like conventional rubber materials.
- LOW ODOR. Reduced odor emission during printing for a comfortable working environment.
- NO PIGMENT SETTLING. Stabilized pigment dispersion enables long vertical printing sessions without settling.
- LOW WATER ABSORPTION. Minimal moisture uptake maintains part integrity in humid environments.

TECHNICAL DATA

Mechanical Properties	Standard	Value
Modulus of Elasticity	ISO 37	15.6 MPa
Stress at Break	ISO 37	3.2 MPa
Elongation at Break	ISO 37	232.3 %
Other Properties	**Standard**	**Value**
Tear Resistance	ASTM D624	6.4 kN·m
Vertical Rebound	ASTM D2632	7 %
Compression set (25 °C, 72h)	ASTM D395	1.7 %
Compression set (70 °C, 72h)	ASTM D395	3.5 %
Viscosity (25 °C)	ISO 2555	2904 MPa·s

Other Properties	Standard	Value
Density (liquid)	ISO 2811	1.04 g·cm^{-3}
Density (solid)	ISO 1183	1.1 g·cm^{-3}
Hardness	ASTM D2240	44 A
Water absorption (24 h)	ASTM D570	0.79 %
Tg, tan d (1 Hz)	ASTM 5418	22.7 °C
Tg, E' (1 Hz)	ASTM 5418	2.6 °C
Tg, E'' (1 Hz)	ASTM 5418	-10.5 °C
Critical Dose	WCM[1]	2.91 mJ·cm^{-2}
Penetration Depth	WCM[1]	110 µm

Tensile Properties	Standard	Non post cured[2]	Wet	Dry	4 weeks in darkness[3]	4 weeks in sunlight[3]
Modulus of Elasticity	ISO 37	6.3 MPa	12.9 MPa	24.3 MPa	20.1 MPa	23.9 MPa
Stress at Break	ISO 37	3 MPa	2.4 MPa	3.5 MPa	3.1 MPa	3 MPa
Elongation at Break	ISO 37	251.1 %	220.4 %	242.6 %	236.4 %	245.3 %

All specimens for various tests were printed using a DLP printer with 2.62 mW·cm^{-2} light intensity and a UV spectrum peak of 406.3 nm. A layer height of 50 µm was used to print the specimens, and the exposure was set at 3.6 s. After printing, the specimens were washed with isopropanol for 15 min in a wash and cure station. Specimens were dried in t he air for 30 min and then post-cured for 1 h in a UV chamber with 3 light sources of 365 nm (27.5 W), 380 nm (27 W) and 395 nm (27.5 W).

[1]P. F. Jacobs, Rapid Prototyping and Manufacturing: Fundamentals of StereoLithography, McGraw-Hill, Inc., New York, NY, USA, 1993.

[2]These properties were measured right after printing, before post-curing.

[3]After post-curing, specimens were exposed to the specified conditions, and only then their properties were measured.

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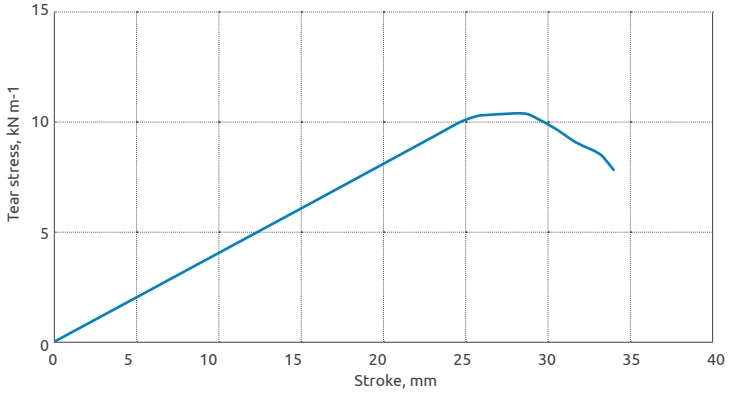
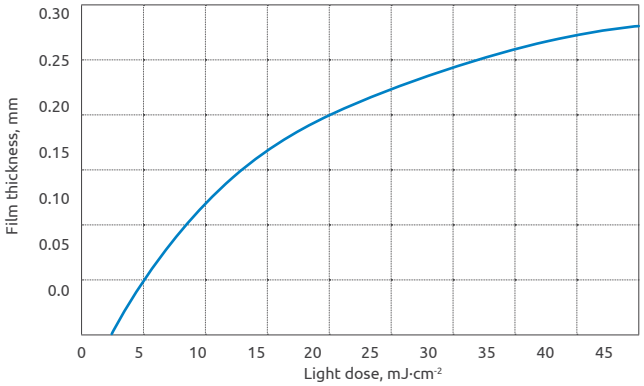
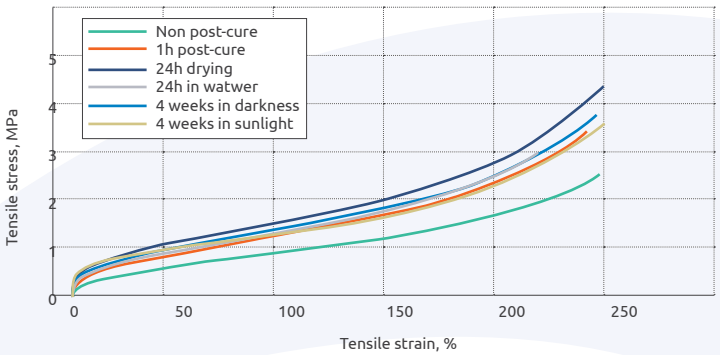
Tear strength diagram of FLX-300



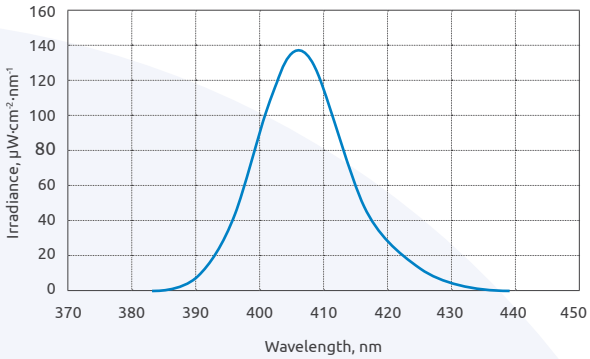
Working curve measurement of FLX-300 resin



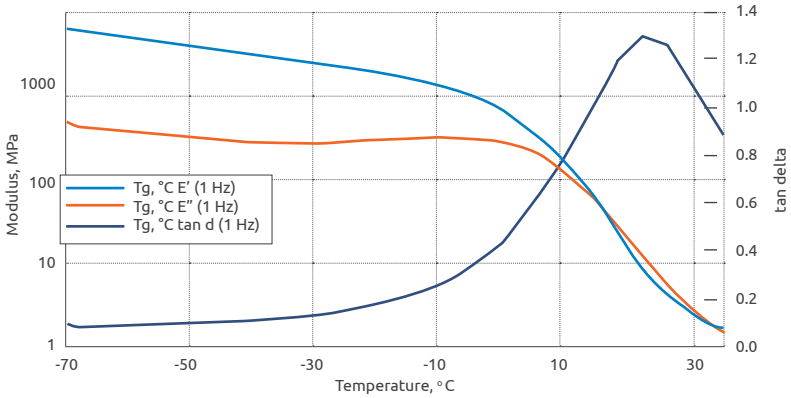
Tensile stress strain diagram of FLX-300



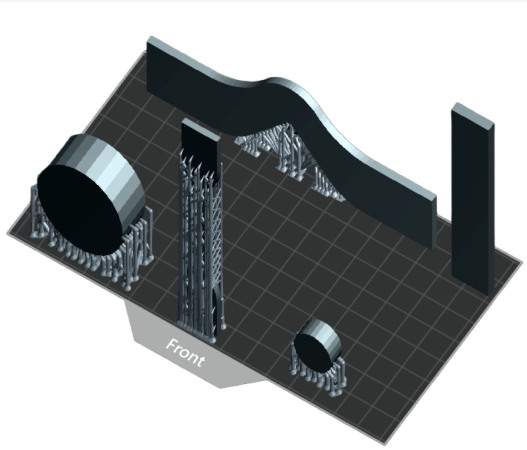
The spectrum of the DLP printer used for specimen preparation



Dynamic Mechanical Analysis Graph of FLX-300



Tensile, Flex and Compression specimen orientation



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COMPATIBILITY

Designed to work on **MSLA and DLP 3D printers**: Anycubic, Phrozen, Elegoo, Asiga, Epax, Longer, Prusa, and similar 3D printers. List of initial 3D printing settings can be found here:

https://ameralabs.com/3d-printing-settings/

FLX-300 should not be used with PDMS based resin trays, because it is too reactive and can damage your PDMS silicon layer. We strongly recommend using fluoropolymer films (FEP, PFA, ACF etc.)

3D PRINTING

For a successful first print, we recommend:

- Heat the resin up to at least 25 °C before printing.
- Level your build plate.
- If it's your first print with this resin, print something small first. We recommend this model:

https://ameralabs.com/blog/town-calibration-part/

- Find initial printing settings here: https://ameralabs.com/3d-printing-settings/
- Use support column thickness of 1.5-2 mm, support tip thickness of 0.4-0.5 mm.
- Keep the support spacing low, for example, 2 mm.
- Avoid "tree" supports and increase cross-bracing between the columns.
- Use rafts with thickness corresponding to your bottom + transition layer height.
- Use slow lift speeds. 45 mm/min for bottom layers, 45-75mm/min for normal layers.
- Use long wait times of 2-10 s before curing, especially for large or hollowed models, big printers.

Let us know if you have any trouble. We are here to help: **support@ameralabs.com**

CLEANING

FLX-300 material has a very high viscosity compared to most 3D printing resins. This 3D material should not be left submerged in solvents for extended periods of time. By all means, do not leave submerged in IPA or any other liquid for more than 30 minutes at a time. Doing so might ruin your models and impact the final properties of polymer material. Supports should be removed before washing since supports could obstruct flow of IPA to the model.

If you use a Wash and Cure station, leave the printed object submerged in IPA for 15 minutes, then take it out to dry in the air. Depending on the geometry of the model, it might require repeated washing to remove resin from holes, negative features and lattices. Washing and drying can be repeated as many times as needed for satisfactory results.

Ordinary IPA baths cleaning method is not recommended.

If you prefer cleaning with an ultrasound cleaner, we recommend putting a printed part into the container with IPA, closeing it well, and putting the container into the ultrasonic cleaner filled with water for 5 minutes. Leave it for no more than 15 minutes. No additional heating is necessary.

After washing the specimens, they should be left to dry for at least 30 minutes.

POST CURING

Post-curing time depends on your curing station. It can vary from 15 minutes to 1 hour (until the surface of your 3D print becomes non-sticky). For better and faster curing, use vacuum or inert gases during curing to reduce oxygen inhibition is recommended. You should post-cure immediately after cleaning and drying. After proper post-curing the

surface of FLX-300 printed objects should be non-sticky.

SAFETY, STORAGE, AND DISPOSAL

Consult the relevant Safety Data Sheet (https://ameralabs.com/msds/) for appropriate handling procedures and protective equipment before using this or any other material referred to in this bulletin. Refer to Safety Data Sheet for emergency and first aid procedures.

Use protective equipment for manipulation.

Store resin at room temperature away from direct sunlight.

This resin is not intended for contact with food, drinks, or for use on or in the human body for medical purposes. Always read the Material Safety Data Sheet (MSDS) thoroughly.

Resins are classified as dangerous chemicals, and it is necessary to dispose of them properly in designated containers. Resin bottles (empty or full) must never be disposed of or poured into the general waste.

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