AMERALABS

ESD-R-100

ESD SAFE RESIN

PERFECT FOR

- Electronics and other industries where electrostatic discharge (ESD) protection is needed
- Tools, casings, & connectors, soldering jigs, conveying, metering, and sensing applications

MB Labsamera
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MATERIAL PROPERTIES

- CARBON NANOTUBE technology.
- THE SURFACE RESISTIVITY of 3D printed parts is in the range of 10^7 to 10^{10} ohm/sq.
- ESD-Safe.
- HIGH-TEMPERATURE RESISTANCE, suitable for soldering jigs and fixtures.
- TOUGH. 3D printed models have a perfect balance of flexibility and tensile strength.
- HARD SURFACE. The surface is glossy and hard (88 Shore D), allowing the accurate capture of the model's dimensions. After post-cure, it does not feel sticky or tacky and is pleasant to touch.
- DIMENTIONAL ACCURACY AND STABILITY. Resin produces dimensionally accurate and stable resin parts. Printed models do not crack or deform because of shrinkage.
- HIGH RESOLUTION. Produces high-resolution models capturing the smallest details.
- LOW ODOR, LOW SKIN IRRITATION. Gloves and simple ventilation are all you need to print comfortably with this resin.
- NO PIGMENT SETTLING. Stabilized pigment dispersion enables extremely long vertical 3D printing sessions. There is no significant pigment settling for days.
- MEDIUM VISCOSITY. No heating is required. It is easy to clean your parts before post-curing and maintain all original model features.
- CONVENIENT PACKAGE. Comes in 500 ml and 1 L bottles or 5 L cans.

TECHNICAL DATA

Tensile Properties	Standard	Value
Modulus of Elasticity	ISO 527-5A	3.47 GPa
Stress at Break	ISO 527-5A	82.8 MPa
Strain at Break	ISO 527-5A	3.9 %
Flexural Properties	**Standard**	**Value**
Modulus of Elasticity	ISO 178	3.25 GPa
Stress at Yield	ISO 178	114.2 MPa
Strain at Break	ISO 178	4.8 %
Compression Properties	**Standard**	**Value**
Modulus of Elasticity	ASTM D695	1.21 GPa

Other Properties	Standard	Value
Surface resistivity	Internal procedure	10^7 to 10^{10} ohm/sq
Impact resistance (notched)	ASTM D256	0.96 kJ·m^{-2}
Heat deflection temperature (0.45 MPa)	ISO 75	95.9 °C
Density (liquid)	ISO 2811-1	1.14 g·cm^{-3}
Density (solid)	ISO 1183-1	1.23 g·cm^{-3}
Viscosity at 25 °C	ISO 2555	800 mPa·s
Hardness	ASTM D2240	88 D
Water Absorption (24 h)	ASTM D570	0.83 %
Critical Dose	WCM[1]	4.715 mJ·cm^{-2}
Penetration Depth	WCM[1]	0.153 µm

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 1.8 s. After printing, the specimens were washed with isopropanol for 14 min in a wash and cure station. Specimens were dried in the air for 30 min and then post-cured for 1 h in a UV chamber with 3 light sources of 365 nm (35 W), 380 nm (28 W) and 395 nm (92 W).

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

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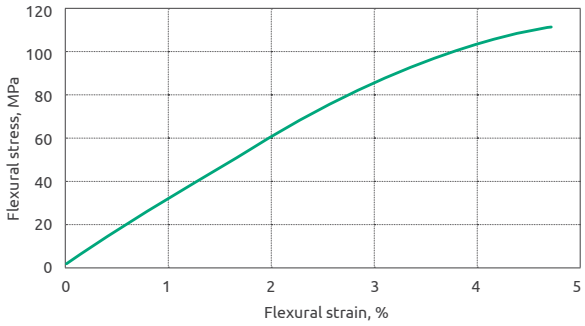
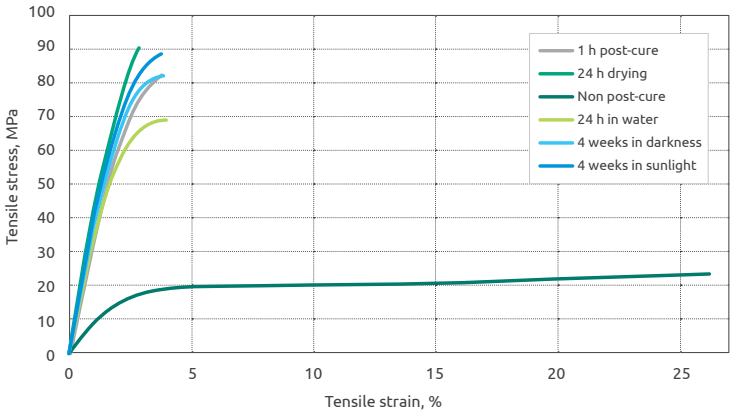
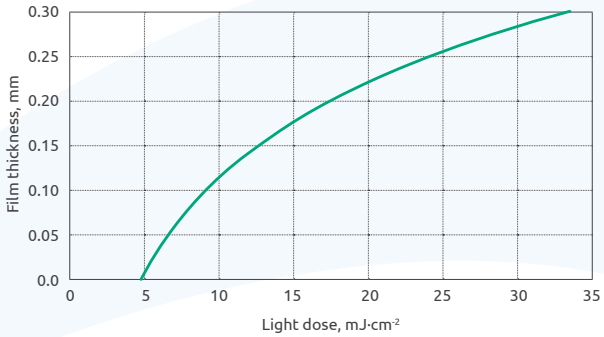
Flexural stress strain diagram of XVN-50



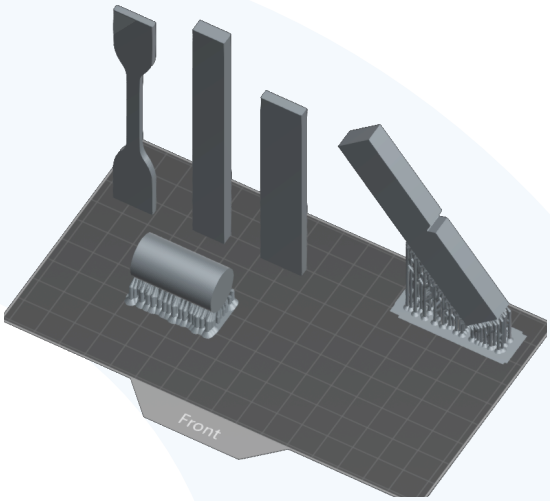
Tensile stress strain diagram of ESD-R-100 at various conditions



Working curve measurement of ESD-R-100 resin



Tensile, Flex and Compression specimen orientation



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COMPATIBILITY

Designed to work with MSLA and DLP 3D printers with both color and monochrome LCD screens: Anycubic, Phrozen, Elegoo, Epax, Longer, Prusa, Asiga and similar 3D printers. List of initial 3D printing settings can be found here: https://ameralabs.com/3d-printing-settings/

ESD-R-100 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 it with FEP, NFEP, PFA, ACF, HDF or similar film based resin trays only.

3D PRINTING

For a successful first print, we recommend:

- 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 0.2-0.6 mm.
- Use attachment layer.
- Hollow your models.
- Shake resin bottle well before use. We recommend placing the bottle in ultrasonic cleaner filled with water for 30 minutes before use.
- Make sure your room temperature is around 22-25 °C.
- Use slower lift speeds. 5mm/min for bottom layers, 40-60 mm/min for normal layers.

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

CLEANING

ESD-R-100 material has a bit higher viscosity than most 3D printing resins.

If you use Anycubic Wash and Cure or similar device, wash the printed object in IPA for 12 minutes. Depending on the results, you can repeat this step again and leave for additional 6 minutes.

If you prefer to clean with ordinary IPA baths, here is our easy 4 steps cleaning procedure:

- After taking your printed object off the build plate leave it submerged in the IPA bath for 10 minutes.
- Swirl the IPA bath with our part in it actively for another 1 minute.
- After swirling, leave it still, but fully submerged for another 10 minutes. At this point it would be wise to change IPA to clean one.
- Finally, swirl the bath actively again for 1 minute.

Evaluate cleaning results and repeat this procedure only once (if needed).

If you prefer cleaning with ultrasonic cleaner, we recommend to put a printed part into the container with IPA, close it well and put the container into the ultrasonic cleaner filled with water. Leave it for no more than 10 minutes. No additional heating is necessary.

POST CURING

It is easier to remove supports before post-curing. However, you can also post-cure a print with supports and remove them later. Depending on the model, this can help to obtain better geometries if you have such goal. Post-curing time depends on your curing station. It can vary from 5 minutes to 1 hour (until the surface of your 3D print becomes non-sticky). You should post-cure immediately after cleaning and drying. After proper post-curing, the surface of ESD-R-100 printed objects should be completely non-sticky and very hard to scratch.

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SAFETY

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. See Safety Data Sheet for emergency and first aid procedures.

This resin is not meant for contact with food, drinks, or medical use on or in a human body. Always read the material safety data sheet 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.

Store resin at room temperature away from direct sunlight.

Use protective gloves and glasses at all times when handling chemical products.

Provide adequate ventilation. This should be achieved using local exhaust ventilation and good general extraction where reasonably practicable. If these are insufficient to maintain concentrations of particulates and solvent vapors below the OEL, suitable respiratory protection must be worn.

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