

FLEX60A RESIN

Flexible 3D Printer Photopolymer



TECHNICAL DATASHEET

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PRODUCT DESCRIPTION

Monocure3D presents Flex60A Resin. Finally, a true rubber-like UV-cured photopolymer resin, taking flexible 3D printing material to the next level! Designed for a use in all MSLA desktop 3D printers, our Rubber-Like resin has a unique composition closely resembles rubber in elasticity after post-processing with the ability to stretch to over 166% and return to its original shape.

NAME: FLEX60A

SKU(s): M/FLX-4161BK, M/FLX-4162T

Available Colour(s): Black, Translucent

**Suitable Models: Model Tyres | Grips & Bands | Meshes | Sleeves & Joints | Washers | Gaskets Seals | Grommets
Hoses and Tubing | Bumpers | Wearables |**



FLEX60A RESIN

Flexible Photopolymer

A rubber-like UV-cured photopolymer resin. Designed for a use in all MSLA desktop 3D printers, Flex60A resin has a unique composition closely resembles rubber in elasticity after post-processing.

Features and Benefits

- ✓ Robust Properties: Exhibits impressive elongation, and rebound rate, making it ideal for functional prototypes and parts requiring flexibility, stretchability and durability.
- ✓ Balanced Adhesion: The resin maintains a perfect balance with adhesion to the build plate, ensuring easy removal without compromising print integrity.
- ✓ High Resolution: Rubber-like boasts high-resolution output and minimal shrinkage, or splitting.
- ✓ Authentic Rubber Feel: Offers an authentic rubber-like feel, opening a realm of applications in various industries.
- ✓ Optimized Post-Cure: Following the post-processing guide below will enhance the tactile experience and usability.
- ✓ Tuning to Perfection: To achieve optimal results, we recommend following the MonoSteps below. If you need further assistance, please contact us through our support page or you can sign up to our Facebook Users Group to get help from our

Applications

Monocure3Ds FLEX60A resin can cater to diverse industrial and hobbyist needs.

- Model Tyres
- Grips & Bands
- Meshes
- Sleeves & Joints
- Washer, Gaskets and Seals
- Dampeners and Shock Absorbers
- Grommets and Bumpers
- Hoses and Tubing

PRINT A CALIBRATION MODEL

If you're using Monocure3D resin for the first time or have recently upgraded your printer, it's essential to fine-tune your slicer settings for optimal performance. The easiest and most effective way to achieve this is by printing a Calibration Model. These compact, detailed prints are quick to produce and help you identify the best settings for perfect synergy between Flex60A resin and your printer.



Download STL file and full instructions by scanning the QR code.



[/monocure3d.com.au/calibration-models/](https://monocure3d.com.au/calibration-models/)

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Monocure3D FLEX60A Resin

Technical Specifications

- 1. Appearance: Flowing liquid**
- 2. Density: 1.00 ~ 1.05 g/cm³**
- 3. Viscosity: 1400 ~ 1800 cps at 25°C**
- 4. Hardness: 65 ~ 67A (Shore A, ASTM D2240)**
- 5. Elongation: 166.9% (ASTM D638)**
- 6. Tensile Strength: 1.92 Mpa (ASTM D638)**
- 7. Tensile Modulus: 2 Mpa (ASTM D638)**
- 8. Resilience: 15% (ASTM D2632-15)**
- 9. Glass Transition Temperature: -10°C (DSC)**

Monocure3D's Flex60A resin is a transformative solution, adding flexibility and durability to your 3D printing capabilities.

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WORKFLOW PROCEDURES

When using 3rd party materials, it is essential to remember that most 3D printers are unique and require setting up before first-time use. We recommend that you dial-in new printers and resins using one of our handy calibration models that you can download from here: <https://monocure3d.com.au/product-category/3d-models/calibration-models/>

PRINTER SETTINGS

The following example settings are with consideration for monochrome LCD MSLA 3D printers employing a 405nm light source. For more information about all our materials and most popular 3D printer models, please refer to the official settings page at: [/monocure3d.com.au/printers/](https://monocure3d.com.au/printers/)

Shake the FLEX60A bottle thoroughly before use and open it in a UV-protected environment. Pour into the printer's vat, allow bubbles to settle, and ensure the temperature is between 18°C and 35°C for optimal printing.

Layer Thickness: 50µm

Base layer Duration: 30(sec)

No. Base Layers: 4

Normal Layer Exposure: 3-4(sec)

MonoSteps to Success

- 1. Preparation of Resin:** Shake the resin container well to ensure uniformity. Carefully remove the protective seal. Pour the resin into the printer's vat allow bubbles to dissipate before proceeding.
- 2. Calibration Test:** Print a calibration model to ensure the printer is accurately dialled in for the new resin. This helps in fine-tuning the settings for optimal printing success.
- 3. Model Placement and Support Structure:** Given the elastic nature of FLEX60A resin, proper model placement and support structure are vital. Set the supports to be heavy and dense, ensuring strong contact points. Whenever feasible, place models directly on the build plate to enhance print success.
- 4. Design Considerations for Hollow Parts:** For hollow parts or designs prone to creating suction, create 1-2mm holes near the build plate in the model using your slicer software. This allows air to escape during printing and facilitates resin drainage from hollow sections post-printing.

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MonoSteps to Success (con't)

5. Lift heights and speeds: Since the material is prone to stretching during the printing process, we recommend you increase the build plate lift heights and reduce your print speeds. This will aid in the printing process and reduce the failure rate considerably.

6. Post-Printing Cleaning: Start with a pre-wash using ResinAway or Isopropyl Alcohol to remove uncured resin. Follow up with a thorough cleaning in an ultrasonic cleaner or wash unit. Dry the print completely using compressed air or a lint-free cloth. It's important to avoid water contact until post-curing is complete.

7. UV Post-Curing: Expose the print to UV light in a curing unit, ideally with a wavelength range of 365-405nm. A 60-minute exposure is recommended, although larger parts may require a longer duration.

8. Heat Curing for Enhanced Properties: For optimal mechanical properties, heat curing is recommended. This involves curing the part at 70°C for 60 to 120 minutes.

9. Final Inspection and Finishing: After curing, inspect the print for any imperfections or uncured resin. If necessary, perform light sanding or trimming to refine the surface or remove any support marks.

10. Storage of Unused Resin: If there is unused resin in the vat, filter it and store it in an airtight container. Keep it away from direct sunlight and in a cool, dry place.

11. Maintenance of Printer and Vat: Regularly clean and maintain your printer and vat to ensure consistent printing quality. Check for any resin spills or debris and clean accordingly with ResinAway Ezy Wipes.

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Glossary of Key Terms and Concepts

- 1. 3D Print:** The process of creating a three-dimensional object from a digital file by layering material in successive layers.
- 2. Base Layer:** The first layers in a 3D printed object that adheres to the build plate.
- 3. Calibration Model:** A specific 3D design used to adjust and test the accuracy of a 3D printer.
- 4. Curing Interface:** The platform on which the 3D print is formed and solidified.
- 5. Elongation at Break:** The measure of a material's ductility represented as a percentage elongation of area during rupture.
- 6. Elephant's Foot:** A phenomenon where the base layer of a print expands outwards, creating a bulged, widened base.
- 7. Extreme Tensile Strength:** A high level of resistance to breakage under tension.
- 8. Green Strength:** The strength of the uncured or unfinished 3D printed resin object.
- 9. Heat Deflection Temperature (HDT):** The temperature at which a polymer or plastic sample deforms under a specified load.
- 10. IZOD Impact Strength Test:** A standard method of determining the impact resistance of materials.
- 11. Layer Thickness:** The height of each individual layer of a 3D printed object, usually measured in microns (μm).
- 12. Liquid Absorption Test:** Measures a material's ability to absorb liquid over a given period of time.
- 13. Monochrome LCD MSLA:** A 3D printer that uses a monochrome LCD to cure a vat of light-sensitive resin layer by layer.
- 14. Post-Curing:** The process of exposing a 3D printed part to a light source after printing to further cure and harden the resin.
- 15. Post-Processing:** The final steps taken after a 3D print is complete to achieve the desired finish.
- 16. RESINAWAY®:** A cleaning solution used to remove uncured resin from the surface of a 3D print.
- 17. Resin:** The light-sensitive liquid material that is solidified layer by layer in a resin-based 3D printer to create an object.
- 18. Shore D Hardness:** This is a measure of the hardness of a material, typically a plastic or rubber.
- 19. Surface Scratch Test:** Measures the amount of scuff or abrasion that is caused by two surfaces rubbing together.
- 20. Supports:** Temporary structures printed along with a 3D print that hold overhanging parts of the print in place until it's cured.
- 21. TENSILE™:** The product name for an industrial type of 3D printing resin produced by Monocure 3D.
- 22. Tensile Strength:** The maximum stress that a material can withstand while being pulled before failing or breaking.
- 23. UV Light Source:** A type of light used in the post-curing process of 3D printed resin parts.
- 24. Young's Modulus:** Young's Modulus is a mechanical property that measures the stiffness of a material.



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Technical Data Sheet Disclaimer

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