

### PRODUCT DESCRIPTION

LOCTITE® 3D 5010 is a single component light curable silicone specifically designed for prototyping via stereolithography or layer-by-layer additive manufacturing. It is a low viscosity yet high performance silicone that upon exposure to light, cures into a tough silicone elastomer.

The LOCTITE® 3D 5010 provides the following product characteristics:

Technology	Stereolithography 3D Resin
Appearance	Available in Clear, White, Black
Chemical Type	Silicone
Odor	Mild
Cure	Ultraviolet (UV) / Visible Light
Viscosity	Low
Application	Prototyping
Specific Benefits	<ul style="list-style-type: none"> <li>● Elastomer</li> <li>● Adhesion between layers</li> <li>● Low shrinkage</li> <li>● Short exposure time</li> </ul>

### FEATURES AND BENEFITS

The LOCTITE® 3D 5010 is intended for use in 3D prototyping where the self-leveling characteristic, fast speed of cure and low shrinkage are key properties for the application. Prototypes made of the LOCTITE® 3D 5010 have a -65°C to 105°C continuous operating temperature.

The LOCTITE® 3D 5010 silicone is unique in that it bonds to itself, eliminating any of the layer to layer interface problems during this light cure application.

### TYPICAL PROPERTIES OF UNCURED MATERIAL

	Typical Value
Specific Gravity @ 25°C	0.99
Flash Point	see MSDS
Viscosity @ 25°C, mPa.s	550
Physica C&P, 50/1 @ 20 1/s or Brookfield C&P, SP52 @ 50 RPM	

### TYPICAL LIGHT CURING PERFORMANCE

LOCTITE® 3D 5010 can be cured by exposure to ultraviolet (UV) and visible light of sufficient intensity and wavelength. The cure rate and ultimate depth of cure depends upon; light intensity (mW/cm<sup>2</sup>), spectral distribution of the light source, exposure time and

percent light transmittance of the printer window through which the light must pass, if applicable. LOCTITE® 3D 5010 will cure with DLP and SLA type 3D printers ranging from 320 to 420 nm.

### TYPICAL LOCTITE® PR10 PRINTER SETTINGS

The following working curve values were determined on the LOCTITE® 3D 5010 for use in the LOCTITE® PR10 printer at 405 nm.

LOCTITE® PR10 Printer (405 nm)			
Working Curve Value	5010 Clear	5010 White	5010 Black
Critical Exposure (E <sub>c</sub> ), mJ/cm <sup>2</sup>	41.2	21.0	41.2
Penetration Depth (D <sub>p</sub> ), mm	0.373	0.328	0.267
Penetration Depth (D <sub>p</sub> ), mil	14.7	12.9	10.5

Contact your local Technical Service Team for recommendations for specific printer settings.

### Surface Cure

When exposed to a full spectrum light source, like the Medium Pressure Hg Arc Lamp @ 100 mW/cm<sup>2</sup> (UVA 320-400 nm) intensity, the LOCTITE® 3D 5010 will typically cure dry to the touch in < 90 seconds. For UV cure after 3D printing, the use of a full spectrum light source or special light cure chamber is suggested in order to effectively cure the surface to a tack free state for handling.

### TYPICAL PROPERTIES OF 3D PRINTED PARTS

Samples prepared using the recommended print settings on the Loctite® PR10 printer provided the following cured material properties.

	Typical Value		
	Clear	White	Black
Hardness, Shore A ASTM D2240	51	49	49
Tensile Strength (N/mm <sup>2</sup> ) ASTM D412,	4.6	3.9	4.9
Modulus @50% elongation (N/mm <sup>2</sup> ) ASTM D412	2.2	2.0	2.0
Elongation @ break (%) ASTM D412	200	174	185

### USE AND APPLICATION

**This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not**



# LOCTITE<sup>®</sup> 3D 5010

## Laboratory Data Sheet

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be selected as a sealant for chlorine or other strong oxidizing materials.

For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).

### Directions for Use

1. This product is light sensitive; exposure to daylight, UV light or artificial lighting should be kept to a minimum during storage and handling.
2. The product should only be used or stored in appropriate light blocking (< 550nm) feed lines, applicators or storage vessels.
3. Shake or stir the LOCTITE<sup>®</sup> 3D 5010 well before use due to the possibility that the colorants may separate or precipitate over long storage periods.
4. For best 3D printing;
  - a. Mix the 3D resin before each print
  - b. Do not leave resin in printer when not in use
  - c. Filter the resin after each 3D print before reuse
5. The product is designed in the process to be initially cured by UV / visible light in layer by layer type application. Increased exposure intensity or time may be required for curing deeper sections or performance properties.
6. Functional strength between layers is achieved almost instantly upon printing. However, an additional UV cure is suggested after the removal of any residual liquid for both surface cure to remove the tackiness and for safe handling of the 3D prototype part.
7. Excess material can be easily wiped away with non-polar solvents.

### Storage

Store product in cool, dry location, in unopened containers at a temperature between 8°C and 28°C unless otherwise labeled. To prevent contamination of unused product, do not return any material to its original container.

### Laboratory Data Sheet

The data contained herein may be reported as a typical value and/or range. Values are based on preliminary laboratory test data using material produced on a laboratory or small-batch production process. All results are subject to final validation using full scale production batches of material and therefore may change. Further information is available via your local Technical Service Team.

### Note

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