

PRODUCT DESCRIPTION

Loctite® 3D 3843™ is a high performance, high modulus product which boasts excellent flexural and tensile physical properties with a relatively high degree of elongation. Loctite® 3843™ displays high green strength and good Heat Deflection Temperature enabling it to print accurately and function in a wide variety of applications. Loctite® 3843™ has been tested in QUV exterior weathering conditions (ASTM G-154) for 800 hours with less than a 15% change in Tensile and IZOD Impact properties. This product should only be printed on a DLP machine.

Loctite® 3D 3843™ provides the following product characteristics:

TYPICAL PROPERTIES OF LIQUID RESIN

Specific Gravity, g/cm³@ 25°C 1.1
 Viscosity, mPa*s (cP) @ 25°C 450 – 750 LMS
 Appearance/Colour Available in Black and Gray

3D PRINTING MACHINE SETTINGS

LOCTITE® 3D 3843™ is formulated to print optimally on DLP machines operating with a wavelength ranging from 300 – 450nm with recommended intensity between 4-8 mW/cm². Cure rate and ultimate depth of cure depend on light intensity, spectral distribution of the light source, exposure time and light transmittance of the printer window through which the light must pass.

The following working curve values were determined using a DLP printer at 405nm and 385nm wavelengths;

Measurement	Wavelength	3843 Gray	3843 Black
Critical Exposure (E _c)	385 nm	9.39 mJ/cm ²	13.59 mJ/cm ²
	405 nm	16.2 mJ/cm ²	18.5 mJ/cm ²
Penetration Depth (D _p)	385 nm	0.317 mm	0.245 mm
	405 nm	0.43 mm	0.477 mm

Typical layer exposure times are given below for 405nm DLP projector @ 6mW/cm²;

	Layer thickness 25 µm	Layer thickness 50 µm	Layer thickness 100 µm
Base layer exposure time	45 secs	45 secs	45 secs
Default layer exposure time	2 secs	3.5 secs	6 secs

TYPICAL PROPERTIES OF PRINTED MATERIAL

All data is recorded on specimens printed in the Z plane at 0.05mm layer thickness on a 405nm wavelength DLP printer. Some variation is expected when printing in the XY plane. The physical properties in the table below are reflective of what one may observe under the noted conditions. Contact your local Loctite Technical Service team for further information.

Mechanical Properties	Test Method	After postprocessing ¹
Tensile Strength at Break	ASTM D638	60 ± 1 MPa
Young's Modulus	ASTM D638	1,890 ± 52 MPa
Elongation at Failure	ASTM D638	47 ± 8 %
Flexural Stress at Yield	ASTM D790	80.6 ± 1.3 MPa
Flexural Modulus	ASTM D790	1,856 ± 130 MPa
Flexural Strain at Break	ASTM D790	>10%
Other Properties		
IZOD Impact strength (Notched)	ASTM D256	53.8 ± 3 J/m
HDT @ 0.455 MPa	ASTM D648	80°C
Water Absorption	ASTM D570	2.35 %

¹Test specimens were exposed for 600 secs per side under a 400W metal halide UV flood lamp @ ~200mW/cm² (UVA).

DURABILITY AND AGING PERFORMANCE

Samples aged using accelerated weathering according to ASTM G154 – Cycle #1. Tested under ASTM D638 – Type IV (Vertically Printed – 100µm).

Mechanical Property	Test Method	% of Initial Strength	
		400 hrs ¹	800 hours ²
Tensile Strength	ASTM D648	101	94
Yield Strength	ASTM D648	102	94
Elongation at Failure	ASTM D648	94	112
Young's Modulus	ASTM D648	110	100

¹400 hours QUV exposure equivalent to 8 months weathering
²800 hours QUV exposure equivalent to 16 months weathering

GENERAL INFORMATION

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

Directions for use:

- This product is light sensitive; exposure to daylight, UV light and artificial lighting should be kept to a minimum during storage and handling.
- **Shake or stir Loctite® 3D 3843™ well before use.**
 - Agitate resin before each print
 - Do not leave resin in printer tray when not in use
- Recommended Post Print Processing:
 - Rinse the printed part using an approved cleaner to remove uncured resin

Storage information may be indicated on the product container labelling.

Optimal Storage: 8 °C to 21 °C. Storage below 8 °C or greater than 28 °C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Centre or Customer Service Representative.

Conversions

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 =$
 $\text{V/mil mm} / 25.4 =$
 $\text{inches } \mu\text{m} / 25.4 =$
 $\text{mil N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

Note

The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.

- The use compressed air or impregnated wipes to remove excess residual solvent from the surface is recommended
- Remove any support structures prior to any postcuring step

Loctite Material Specification^{LMS}

Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Quality.

Storage

Store product in the unopened container in a dry location.

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