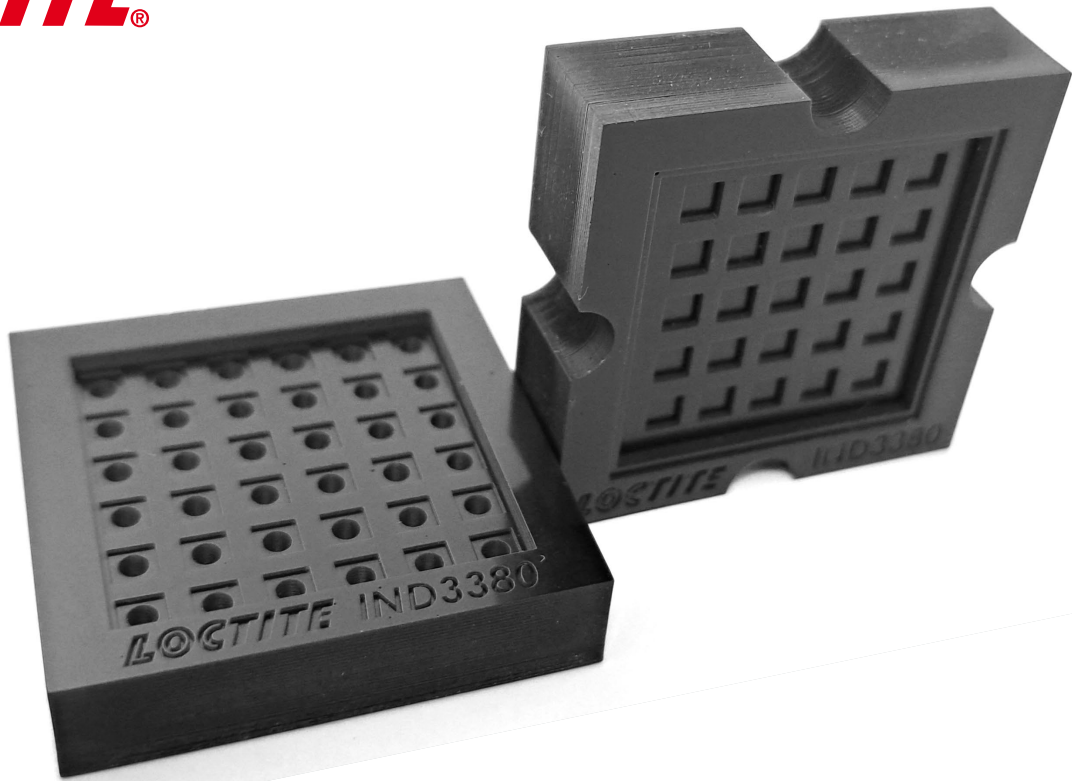


LOCTITE®



LOCTITE 3D IND3380™

ESD
Black

LOCTITE®

Henkel Corporation

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IND3380™ ESD

LOCTITE 3D IND3380™

LOCTITE 3D IND3380 BK is a high temperature resistant resin with HDT of 190°C, electrostatic dissipative properties (ESD), and high stiffness.

LOCTITE 3D IND3380 BK offers a smooth surface finish and high chemical resistance, making it an ideal choice for jigs and fixtures in general and electronic manufacturing. Additionally, its unique characteristics make it a reliable option for tooling applications, offering versatile solutions for manufacturing needs.

LOCTITE 3D IND3380 BK is compatible with a broad range of DLP and LCD machines.



Benefits:

- Displays electrostatic dissipative properties (ESD)
- High HDT of 190°C
- High accuracy and fine detail printing



Ideal for:

- Tooling at high temperature, low pressure
- Jigs and fixtures for electronic device manufacturing processes



Markets:



Industry



Consumer
Goods



Automotive

Tensile Stress at Break (MPa)

50

Young's Modulus (MPa)

3,000

Elongation at Break (%)

2

HDT at 0.455 (MPa)

190





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PROPERTIES

Mechanical Properties	Measure	Method	Green	Post Processed
Young's Modulus	MPa	ASTM D638	1300 – 1500	2800 – 3000 ^[1]
Tensile Stress at Break	MPa	ASTM D638	25 – 30	40 – 50 ^[1]
Elongation at Break	%	ASTM D638	2 – 3	1 – 2 ^[1]
Flexural Modulus	MPa	ASTM D790	1250 – 1350	3200 – 3400 ^[2]
Flexural Strength	MPa	ASTM D790	40 – 50	75 – 85 ^[2]
Flexural Strain at Break	%	ASTM D790	3.0 – 4.3	2.0 – 2.8 ^[2]
IZOD Impact (Notched)	J/m	ASTM D256		11.5 – 12.5 ^[3]
Shore Hardness (3s)	D	ASTM D2240		86 ^[4]
Other Properties				
HDT at 0.455 MPa	°C	ASTM D648		180 – 190 ^[5]
HDT at 1.82 MPa	°C	ASTM D648		100 – 110 ^[5]
Water Absorption (24 hr)	%	ASTM D570		<0.4 ^[6]
Solid Density	g/cm ³	ASTM D1475		1.20 – 1.25 ^[7]
Thermal Conductivity	W/(m·K)	ASTM D5930		1.4 ^[8]
Heat Capacity	J/(g·K)	ASTM D5930		0.2 ^[8]

Test Parameters:

All specimen are printed unless otherwise noted. All specimen were conditioned in ambient lab conditions at 19-23°C / 40-60% RH for at least 24 hours. D638-14 Type IV, 5 mm/min; D790-17 Method B, 1.5 mm/min; D648-18 Method A; D256-10 (18) - Machine Notched, 6 mm x 12 mm, 2.75 J Striker; D570-98 (18) - 0.125" x 2" Disc, 24hr @ 25°C; D2240-15 (21); D7867-13 (20); D1475-13 (20)

Internal Data Sources

[1] GEN492458, [2] GEN492508, [3] FOR503640, [4] FOR504329, [5] GEN492558, [6] FOR415557, [7] FOR512821, [8] FOR515717



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PROPERTIES

Liquid Properties	Measure	Method	Value
Viscosity at 25°C (77°F)	cP	ASTM D7867	9,000 – 11,000 ^[1]
Liquid Density	g/cm ³	ASTM D1475	1.1 – 1.2 ^[2]

Electrical Properties	Measure	Method	Green	Post Processed
Surface Resistivity	Ω	DIN EN61340-2-3		10 ⁴ – 10 ¹¹ ^[3]
Volume Resistivity	Ω·cm	DIN EN61340-2-3		4·10 ⁶ – 24·10 ⁶ ^[4]

Test Parameters:

All specimen are printed unless otherwise noted. All specimen were conditioned in ambient lab conditions at 19-23°C / 40-60% RH for at least 24 hours. D638-14 Type IV, 5 mm/min; D790-17 Method B, 1.5 mm/min; D648-18 Method A; D256-10 (18) - Machine Notched, 6 mm x 12 mm, 2.75 J Striker, D570-98 (18) - 0.125" x 2" Disc, 24hr @ 25°C; D2240-15 (21); D7867-13 (20); D1475-13 (20)

Internal Data Sources:

[1] FOR421227, [2] FOR415604,[3] FOR504358, [4] FOR501814





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WORKFLOW

Validated workflows need to be followed to achieve properties as provided in the TDS. Examples of validated workflow steps are listed below. Users should defer to the most current workflow information for best results which can be found at <https://www.loctiteam.com/printer-validation-settings>

PRINTER SETTINGS

LOCTITE 3D IND3380 BK is formulated to print optimally on industrial DLP printer. Read the safety data sheet carefully to get details about health and safety instructions. Recommended print parameters:

- Shake gently to prevent foaming
- Print Temperature: 20°C to 45°C
- Intensity: 5 mW/cm² to 10 mW/cm²

Settings: 385nm at 5mW/cm ²	Measure	Method	Value
Layer Thickness	µm	Internal	100
Burn-In region	s	Internal	40-50
Transition region	s	Internal	15-25
Model region	s	Internal	7-8

Settings: 385nm at 5mW/cm ²	Measure	Method	Value
E _C	mJ/cm ²	Internal	4.9 ^[1]
D _P	mm	Internal	0.09 ^[1]

Settings: 385nm at 5mW/cm ²	Measure	Method	Exposure time
D _C = 50µm	s	Internal	1.7
D _C = 100µm	s	Internal	2.9

Test parameters:
Exposure times are calculated without a safety factor

Internal Data Source:
[1] EOR414287





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CLEANING

LOCTITE 3D IND3380 BK requires post processing to achieve specified properties. Prior to post curing, support structures should be removed from the printed part, and the part should then be washed. Use compressed air to remove residual solvent from the surface of the material between intervals.

Post Process Step	Agent	Method	Duration	Intervals	Additional Info
Cleaning Step	IPA	Ultrasonic	2 min	1 or 2	Allow parts to dry
Dry	n.a.	Compressed air	10 to 60 s	1 or 2	Air pressure (50 psi)
Wait before post curing	n.a.	Ambient condition	60 min	1	Room temperature

POST CURING

LOCTITE 3D IND3380 BK requires post curing to achieve specified properties. It is recommended that either an LED or wide spectrum lamp be used to post cure parts.

After using a post curing unit, an additional heat cure at 170°C for 3 hours is required to reach the best properties. Allow the parts to rest one hour between UV cure and heat cure. To minimize risk of warpage place parts in cold oven before ramping up temperature to target value and cool down parts slowly in switched off oven after reaching the heat curing conditions.

UV Curing Unit	UV Source	Intensity	Cure time per side	Additional Settings (Shelf, Output Energy)	Heat Cure
Dymax 5000 EC Flood	Mercury Arc Bulb (broad spectrum)	148 mW/cm ² at 380 nm	10 min	400W, Shelf K	3 hours at 170°C
Loctite CL36	405nm LED	80 mW/cm ² at 405 nm	30 min	100% top & side	3 hours at 170°C
Rapidshape RS Cure XL	Multiple LEDs	150%	30 min	Third shelf from bottom	3 hours at 170°C





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WORKFLOW

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STORAGE

Store **LOCTITE 3D IND3380 BK** in the unopened container in a dry location. Optimal storage: 20°C to 30°C, storage below 20°C or greater than 30°C can adversely affect products properties. More specific information is given in the Safety Data Sheet.

ESD PROPERTIES

LOCTITE 3D IND3380 BK provides ESD properties with a surface resistivity in the range of $10^4\Omega$ to $10^{11}\Omega$ accordingly to DIN EN61340-2-3.

The exact value of the surface resistivity depends on the print orientation and part geometry. Please note that the burn-in region can show higher surface resistivity outside of the ESD range. Due to that we recommend to print with parts on supports or to adjust the print orientation accordingly to ensure that the printed part provides ESD properties at the desired surface.





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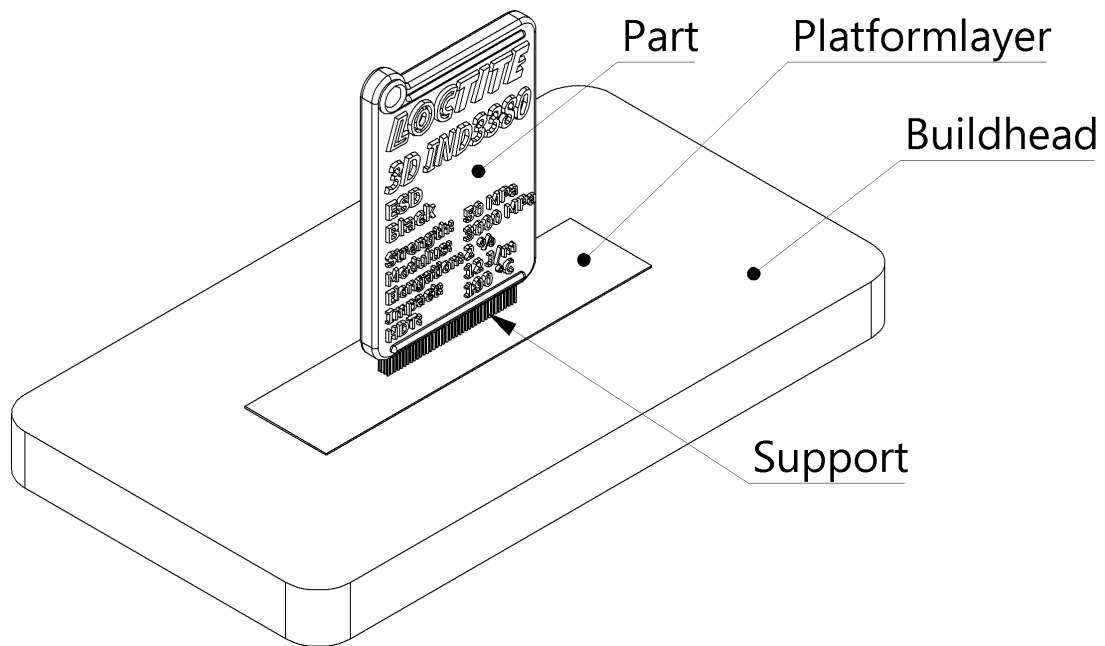
TIPS & TRICKS

This section is a collection of useful advices, guides, and recommendations designed to help users of the **LOCTITE 3D IND3380 BK** deal with specific process tasks more efficiently.

PRINT ORIENTATION

To enhance the buildhead adhesion of **LOCTITE 3D IND3380 BK**, it is recommended to use an initial platform layer. The required part should be attached to this layer using supports. The burn-in region, which will be the initial platform layer, can be discarded afterwards. This also ensures that the printed part provides the desired ESD performance since the burn-in region can show higher surface resistivity outside of the ESD range.

The part should be orientated to have the smallest possible cross-sectional area in the z-direction to minimize detachment forces during the print process.





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NOTE

The information provided in this Preliminary Technical Data Sheet (pTDS) 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.

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