

LOCTITE®



P3 Stretch IND475™

High Rebound
Photoelastic
Black

LOCTITE®

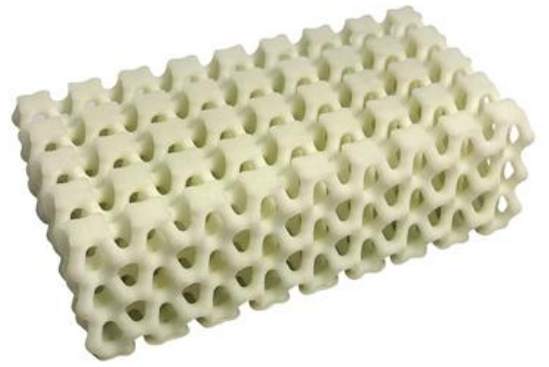
Henkel Corporation

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P3 Stretch IND475™ PHOTOELASTIC BLACK



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IND475 is a single component UV resin that cures to a soft, elastomeric material.

IND475 is a flexible material that gives a good balance of hardness, strength and elongation.

IND475 is a low viscosity liquid, printable at room temperature.



Benefits:

- True elastomeric behavior
- Fast Printing with low shrinkage behavior
- High resilience / High energy return



Ideal for:

- Air and dust gaskets
- Flexible seals and housings
- Cushioning pads



Markets:



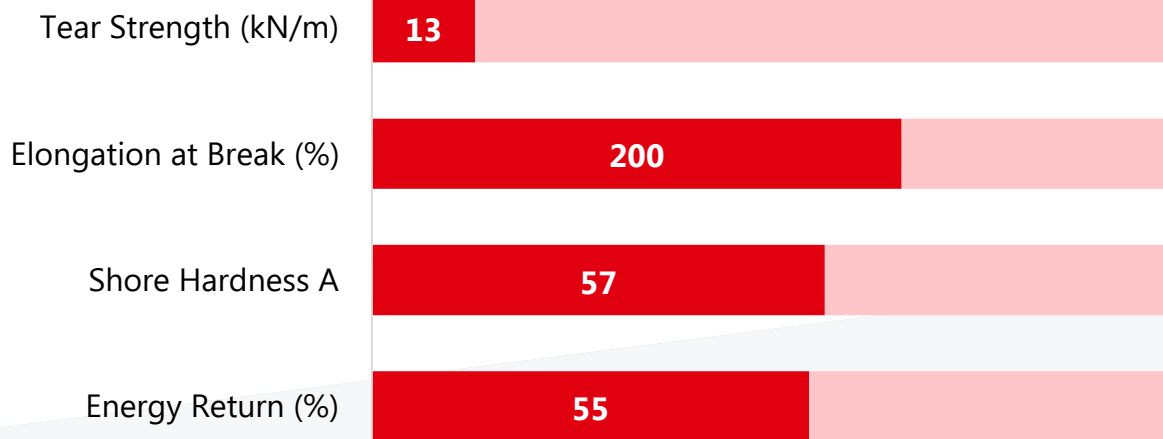
Industry



Automotive



Consumer
Goods

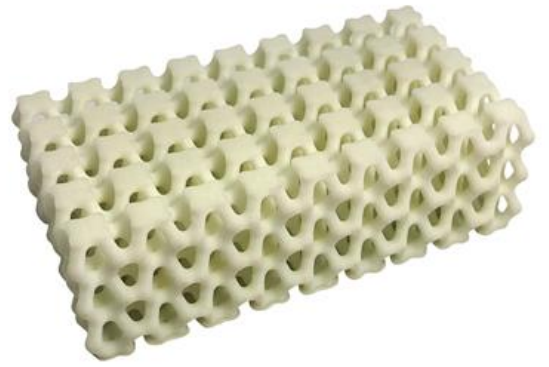


*Values shown are linked to LOCTITE IND475 White as reference, please refer to the specific mechanical properties for each of the colors shown in this document





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MECHANICAL PROPERTIES

Mechanical Properties	Measure	Method	Green	Post Processed
Tensile Stress at Break	MPa	ASTM D638	-	2.4 ± 0.6 ^[1]
Young's Modulus	MPa	ASTM D638	-	2.5 ± 0.3 ^[1]
Elongation at Break	%	ASTM D638	-	122 ± 11 ^[1]
Tear Strength	kN/m	ASTM D624	-	7.5 ± 1.2 ^[2]
Energy Return	%	Internal	-	77 ± 4 ^[3]
Other Properties				
Shore Hardness (0s, 5s)	A	ASTM D2240	-	49, 45 ^[4]
Solid Density (Green)	g/cm ³	ASTM D792	-	1.16 ^[5]
Solid Density (Cured)	g/cm ³	ASTM D792	-	1.06 ^[5]
Volumetric Shrinkage	%	Internal	-	-9 ^[5]
Water Absorption (24hr)	%	ASTM D570	-	3.2 ^[6]
Water Absorption (72hr)	%	ASTM D570	-	5.4 ^[6]
Water Absorption (168hr)	%	ASTM D570	-	8.5 ^[6]

Liquid Properties	Measure	Method	Value
Viscosity @ 25°C (77°F)	cP	ASTM D7867	1,500 ^[7]
Liquid Density	g/cm ³	ASTM D1475	1.01 ^[5]

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. ASTM Methods: D638 Type IV, 5 mm/min, D790-B, 2 mm/min, D648, D256 Notched IZOD (Machine Notched), 6 mm x 12 mm, D570 0.125" x 2" Disc 24hr@ 25°C, D2240, Type "D" (0, 3 seconds), D7867, D1475

Internal Data Sources:

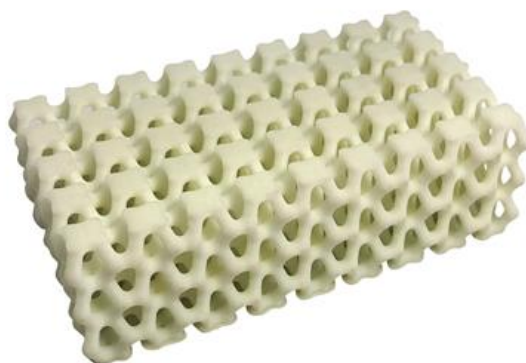
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ELECTRICAL PROPERTIES

Electrical Properties	Measure	Method	Green	Post Processed
Volume Resistivity	$\Omega \cdot \text{cm}$	ASTM D257	-	5.79E +10 ^[1]
Surface Resistivity	Ω	ASTM D257	-	1.43E +12 ^[1]
Dielectric Strength	kV/mm	ASTM D149	-	27.9 ^[2]
AC Relative Permittivity (Dielectric Constant) ^[3]				
at 50 Hz (XY)	none	ASTM D150	-	7.2
at 1 kHz (XY)	none	ASTM D150	-	5.7
at 1 MHz (XY)	none	ASTM D150	-	4.2
AC Loss Characteristic (Dissipation Factor) ^[3]				
at 50 Hz (XY)	none	ASTM D150	-	0.067
at 1 kHz (XY)	none	ASTM D150	-	0.090
at 1 MHz (XY)	none	ASTM D150	-	0.193

Internal Data Sources:

[1] FOR106283 [2] FOR106286 [3] FOR106285





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Additional Workflow Notes

PRINT SETTINGS

Printing with **LOCTITE® 3D IND475™** requires detailed attention to interactions between the material and the hardware in use. Mechanical process settings must be optimized for each printer based on the hardware and software capabilities. Due to the low durometer and high elasticity of the material, printed parts may sway during tray release, build head movement, and upon re-entering the resin. For this reason, the user must consider many variables while printing. Some applicable print process considerations and respective guidelines are discussed below. Critical considerations include adhesion behavior at the print interface, model geometry, and model print orientation.

Lift Height Between Layers: Larger parts may require larger lift heights due to overall elongation magnitude.

- Small parts (<25 mm height): 10-15mm
- Medium parts (25 - 100 mm height): 20-25 mm
- Large parts (>100mm height): 25-30 mm

Build Head Movement Rates: Thicker parts allow for more rapid rates due to overall part rigidity compared to printing forces.

- Low Thickness (<5mm thickness): 3-5 mm/second
- Medium Thickness (5-10 mm thickness): 3-10 mm/second
- High Thickness (>10 mm thickness): 3-20 mm/second

Time Delay Before Layer Exposure:

- Generally, 3-5 seconds is sufficient due to the resin's low viscosity. Parts with thin features may require longer times for the small features to return to the correct position as they normalize with the resin's viscosity forces.

Support Structures:

- Place supports on non-critical model surfaces if possible. Support structure placement and geometry is model-dependent based on model layer surface area. General recommendations are provided.
- Support Thickness: 0.6-0.8 mm diameter
- Support Contact Area: 25-75% support thickness

POST PROCESSING

- **LOCTITE® 3D IND475™** requires post processing to achieve specified properties. Prior to post curing, the part should be washed in a friendly cleaner.
- Post curing of **LOCTITE® 3D IND475™** to reach stated property targets must be cured in water or an alternative inert medium.
- Coating parts with a spray-on mold release agent such as **LOCTITE® Frekote 770-NC** or **Smooth-On Universal Mold Release** prior to post curing can reduce the surface tack of a final part. After curing, the mold release can be rinsed off with water or Isopropanol.



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