

LOCTITE 3DP INSTANT BONDER

June 2018

PRODUCT DESCRIPTION

Loctite 3D Printing Instant Bonder™ provides the following product characteristics:

Technology	Instant Adhesive
Appearance	Clear, colorless to straw-colored liquid ^{LMS}
Chemical Type	Cyanoacrylate ester
Viscosity	Low
Cure	Moisture Cure
Application	Bonding
Key Substrates	3D Printed plastics
Specific Benefits	<ul style="list-style-type: none"> Fast curing High strength Easy application

Loctite 3DP Instant Bonder is a one-component cyanoacrylate adhesive developed for high performance instant bonding on close fitting plastic parts. The product is particularly suited to the bonding of 3D printed materials and has been extensively tested on all major substrates based on industrial 3D printing processes including Stereolithography, Selective Laser Sintering, Fused Filament Fabrication and Binder Jetting technologies. Loctite 3DP Instant Bonder is also suitable for joining 3D materials to traditional engineering materials such as metals, plastics and ceramics.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25°C 0.7008^{LMS}

Flash Point - See MSDS

Viscosity, Cone & Plate, mPa·s (cP): 70 to 110^{LMS}
 Temperature: 25 °C, Shear Rate: 3,000 s⁻¹

TYPICAL CURING PERFORMANCE

Under normal conditions, atmospheric moisture initiates the curing process. Although full functional strength is developed in a relatively short time, curing continues for at least 24 hours before full chemical/solvent resistance is developed.

Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The table below shows the fixture time achieved on different materials at 22 °C / 50 % relative humidity. This is defined as the time to develop a shear strength of 0.1 N/mm².

Fixture Time, seconds:

3D printed materials;

SLA Resin	<5
PA11/PA12 (SLS/MJF)	<5
PLA (FFF)	<5

ABS (FFF printed)	<5
Other common engineering materials	
ABS	<5
PVC	<5
Steel	<5
Aluminium	<5
Rubber (nitrile)	<5
Polycarbonate	5 to 10
Wood (oak)	15 to 30

Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. Thin bond lines result in high cure speeds, increasing the bond gap will decrease the rate of cure.

Cure Speed vs. Humidity

The rate of cure will depend on the ambient relative humidity. Higher relative humidity levels result in more rapid speed of cure.

Cure Speed vs. Activator

Where cure speed is unacceptably long due to large gaps, applying activator to the surface will improve cure speed. However, this can reduce ultimate strength of the bond and therefore testing is recommended to confirm effect.

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 10 seconds @ 22 °C
 Tensile Strength, ISO 6922:

Buna-N	N/mm ² (psi)	≥6.9 ^{LMS} (≥1,000)
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Cured for 72 hours @ 22 °C
 Tensile Strength, ISO 6922:

Buna-N	N/mm ² (psi)	13.7 (1,900)
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Adhesive Properties

Cured for 7 days @ 22 °C / 50% RH
 Lap Shear Strength, ISO 4587:

PA12 / PA12	N/mm ² (psi)	8.8 (1276)
PA 12 Glass Beads	N/mm ² (psi)	3.2 (464)
PA 11	N/mm ² (psi)	5.7 (8267)
SLA Durable	N/mm ² (psi)	15.1 (21901)
FFF Nylon 12 CF	N/mm ² (psi)	5.5 (798)
FFF ASA	N/mm ² (psi)	4.4 (638)

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GENERAL INFORMATION

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not 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. Bond areas should be clean and free from uncured resin, grease or loose powder. Clean all surfaces with a Loctite® cleaning solvent and allow to dry.
2. To improve bonding on low energy plastic surfaces, Loctite® Primer may be applied to the bond area. Avoid applying excess Primer. Allow the Primer to dry.
3. LOCTITE® Activator may be used if necessary. Apply it to one bond surface (do not apply activator to the primed surface where Primer is also used). Allow the activator to dry.
4. Apply adhesive to one of the bond surfaces (do not apply the adhesive to the activated surface). Do not use items like tissue or a brush to spread the adhesive. Assemble the parts within a few seconds. The parts should be accurately located, as the short fixture time leaves little opportunity for adjustment.
5. LOCTITE® Activator can be used to cure fillets of product outside the bond area. Spray or drop the activator on the excess product.
6. Bonds should be held fixed or clamped until adhesive has fixtured.
7. Product should be allowed to develop full strength before subjecting to any service loads (typically 24 to 72 hours after assembly, depending on bond gap, materials and ambient conditions).

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labelling.

Optimal Storage: 2 °C to 8 °C. Storage below 2 °C or greater than 8 °C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation 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 Center or Customer Service Representative.

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.

Conversions

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

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.

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