

LOCTITE 3DP UNIVERSAL BONDER

June 2018

PRODUCT DESCRIPTION

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

Technology	Cyanoacrylate/Acrylic Hybrid
Chemical Type (Part A)	Cyanoacrylate
Chemical Type (Part B)	Methacrylate
Appearance – Part A	Transparent, cloudy, colourless to pale yellow ^{LMS}
Appearance – Part B	Clear colourless to slightly yellow liquid ^{LMS}
Components	Two components – requires mixing
Viscosity	No-sag
Mix Ratio by volume: Part A: Part B	10:1
Cure	Two component cure after mixing
Application	Bonding
Key Substrates	3D Printed plastics
Specific Benefits	<ul style="list-style-type: none"> Fast curing Gap filling Multi-substrate adhesion

LOCTITE® 3DP Universal Bonder is a two component, hybrid adhesive that provides a fast fixture at room temperature in bond gaps up to 5 mm (0.2 in). This product has excellent bonding characteristics to a wide variety of 3D printed substrates. LOCTITE® 3DP Universal Bonder is designed for applications where complete cure of excess adhesive is required which can be subsequently sanded. The gel consistency allows for accurate control of adhesive flow even on vertical surfaces.

TYPICAL PROPERTIES OF UNCURED MATERIAL

PART A:

Specific Gravity @ 25°C 1.05 to 1.1

Casson Viscosity @ 25 °C, mPa·s (cP):
Cone & Plate Rheometer 200 to 1,300^{LMS}

PART B:

Viscosity, Cone & Plate, mPa·s (cP): 1 to 30^{LMS}
Temperature: 25 °C, Shear Rate: 1,000 s⁻¹

TYPICAL CURING PERFORMANCE

Curing is initiated on mixing the Part A and Part B components. Handling strength is achieved rapidly; full strength is achieved over time.

Nozzle Life

Gel Time in Mixer Nozzle, minutes 4 to 5

Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. Thin bond lines (gap <0.1mm) result in high cure speeds developing handling strength within 3-5 minutes. Increasing the bond gap will decrease the rate of cure resulting in fixture times for gaps >1mm of approximately 5-6 minutes.

TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 1 week @ 22 °C

Physical Properties:

Glass Transition Temperature ISO 11359-2, °C	110
Shore Hardness, ISO 868, Durometer D	65
Coefficient of Thermal Expansion, ISO 11359-2 K ⁻¹ : Below Tg (110°C)	129x10 ⁻⁶
Linear Shrinkage, ASTM D 792 %	4.3
Tensile Strength, at break, ISO 527-3	N/mm ² 14.6 (psi) (2,117)
Tensile Modulus, ISO 527-3	N/mm ² 960 (psi) (139,200)
Elongation, at break, ISO 527-3, %	4.9

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 1 week @ 22 °C

Lap Shear Strength, ISO 4587:	
PA12 / PA12	N/mm ² 4.4 (psi) (638)
PA 12 Glass Beads	N/mm ² 2.8 (psi) (406)
PA 11	N/mm ² 4.4 (psi) (638)
SLA Durable	N/mm ² 5.3 (psi) (767)
FFF Nylon 12 CF	N/mm ² 3.8 (psi) (551)
FFF ASA	N/mm ² 5.5 (psi) (798)

Hot Strength

Loctite 3DP Universal Bonder is suitable for applications with short-term exposure to temperatures between 100 - 120°C (subject to the thermal stability of the bonded substrates). At 120°C the retained strength is equivalent to 20% of the initial room temperature strength.

Heat Ageing

The maximum recommended service temperature for long term exposure (>1,000 hours) is 80°C.

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Chemical/Solvent Resistance

Loctite 3DP Universal Bonder is resistant to most common solvents and cleaners when exposed at room temperature – including IPA, ethanol, water and motor oils. Contact your local Technical Service Group for data on long-term resistance against chemicals at elevated temperatures.

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 printing resin or loose powder. Clean all surfaces with a Loctite® cleaning solvent and allow to dry.
2. To use, Part A and Part B must be mixed. Product can be applied directly from the cartridge by using the plunger supplied and dispensing through the recommended mixing nozzle.
3. Hold the cartridge upright and insert the plunger.
4. While keeping the cartridge in an upright position, remove cap, attached the mixing nozzle, and begin dispensing the adhesive upward until any bubbles present in the smaller component have been removed.
5. Dispense and discard a bead as long and as wide as the mixing nozzle, to ensure sufficient mixing.
6. Apply the mixed adhesive to one of the bond surfaces to be joined. Parts should be assembled immediately after the mixed adhesive has been applied.
7. Bonds should be held fixed or clamped until adhesive has fixtured (typically 3 – 6 minutes depending on gap).
8. Keep assembled parts from moving during cure. The bond should be allowed to develop full strength before subjecting to any service load (typically 24 hours).

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 21 °C. Storage below 2 °C or greater than 21 °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 Centre or Customer Service Representative.

Loctite Material Specification^{LMS}

LMS (Part A) and LMS (Part B). 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 Loctite 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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