

LOCTITE[®] AA 3920[™]

Known as LOCTITE[®] 3920[™]
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PRODUCT DESCRIPTION

LOCTITE[®] AA 3920[™] provides the following product characteristics:

Technology	Acrylic
Chemical Type	Modified acrylate
Appearance (uncured)	Translucent, colorless to dark amber liquid, Free of visible air bubbles and undissolved particles ^{LMS}
Components	One component - requires no mixing
Viscosity	Medium
Cure	Activator
Secondary Cure	Ultraviolet (UV) light
Cure Benefit	Production - high speed curing
Application	Bonding

LOCTITE[®] AA 3920[™] is a multicure acrylic adhesive designed primarily to provide fast fixture speed and secondary UV cure of exposed fillets. The product has the capability to produce tough, durable bonds with outstanding impact and peel resistance. Activator 7380[™] or 7387[™] may be used to cure the product. The secondary cure through exposure to ultraviolet light allows LOCTITE[®] AA 3920[™] to be used in many applications where surface cure is required. This adhesive is particularly suited to DC motor assembly, magnet bonding and bonding of pre-coated sheet metal. Automated assembly lines with short cycle times and exposed adhesive fillets will benefit from the rapid multicure characteristics of this product.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Specific Gravity @ 25 °C	1.16
Flash Point - See SDS	
Viscosity, Brookfield - HBT, 25 °C, mPa·s (cP):	
Spindle TA, speed 20 rpm,	7,000 to 13,000 ^{LMS}
Spindle TE, speed 2.5 rpm	45,000
Spindle TE, speed 20 rpm	11,000

TYPICAL CURING PERFORMANCE

Cure performance of this product will vary according to specific applications. Exploratory testing is recommended as these figures may be conservative.

Fixture Time

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm².

Fixture Time, ISO 4587, seconds:

Steel:	
0.05 mm gap, 1 side activated with Activator 7380 [™]	≤30 ^{LMS}
0.25 mm gap, 1 side activated with Activator 7380 [™]	330

UV Fixture Time, Glass microscope slides, seconds:

6 mW/cm ² , measured @ 365 nm	≤15 ^{LMS}
100 mW/cm ² , measured @ 365 nm	5

Tack Free Time

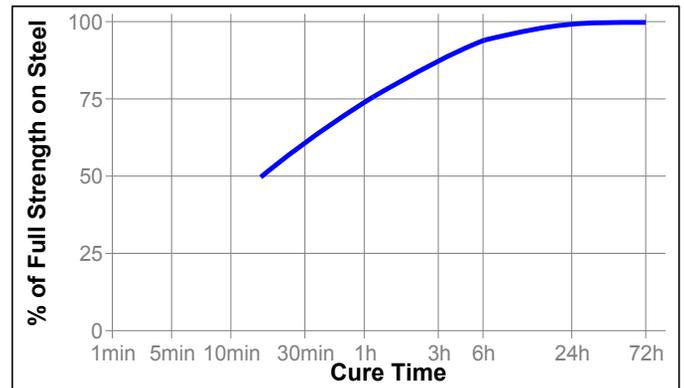
Tack Free Time is the time required to achieve a tack free surface

Tack Free Time, seconds:

100 mW/cm ² , measured @ 365 nm	20
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Cure Speed vs. Activator

The graph below shows the shear strength developed with time on steel lap shears using Activator 7380[™] and tested according to ISO 4587.



Heat Cure

Heat can be used to effect or accelerate cure when surface priming operations are undesirable. Typical heat cure conditions consist of heating and maintaining bondline at a temperature given below for the corresponding time specified. Optimum conditions for heat cure should be determined on the actual assemblies.

110 °C for 60 minutes
121 °C for 11 minutes
150 °C for 7 minutes

TYPICAL PROPERTIES OF CURED MATERIAL**Physical Properties:**

Shore Hardness, ISO 868, Durometer D	65
UV Depth of Cure, mm:	
100 mW/cm ² , measured @ 365 nm	3.6
Elongation, ISO 527-3, %	130
Tensile Strength, ISO 527-3	N/mm ² 18.6 (psi) (2,700)
Tensile Modulus, ISO 527-3	N/mm ² 144.8 (psi) (21,000)

TYPICAL PERFORMANCE OF CURED MATERIAL

Cured for 24 hours @ 22 °C, Activator 7380™ on 1 side

Lap Shear Strength, ISO 4587:

Steel:

0.05 mm gap	N/mm ² ≥13.8 ^{LMS} (psi) (≥2,001)
0.5 mm gap	N/mm ² ≥6.9 ^{LMS} (psi) (≥1,000)

Cured for 48 hours @ 22 °C, Activator 7380™ on 1 side

Lap Shear Strength, ISO 4587:

Steel:

0.05 mm gap	N/mm ² 17.2 (psi) (2,500)
0.25 mm gap	N/mm ² 15.9 (psi) (2,300)
0.5 mm gap	N/mm ² 14.5 (psi) (2,100)
Aluminum	N/mm ² 11.0 (psi) (1,600)
Zinc dichromate	N/mm ² 11.0 (psi) (1,600)

Cured @ 100 mW/cm², measured @ 365 nm,

Block Shear Strength, ISO 13445:

Steel to Glass	N/mm ² 12.4 (psi) (1,800)
Aluminum to Glass	N/mm ² 9.0 (psi) (1,300)

Torsional Shear Strength, ASTM D 3658:

Aluminum hex button to glass	N·m 108.4 (lb.ft.) (80)
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TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 48 hours @ 22 °C, Activator 7380™ on 1 side

Lap Shear Strength, ISO 4587:

Steel

Heat Aging

Aged at temperature indicated and tested @ 22 °C

Aged @ 93 °C for 1,000 hours	N/mm ² 13.1 (psi) (1,900)
Aged @ 121 °C for 1,000 hours	N/mm ² 9.0 (psi) (1,300)
Aged @ 150 °C for 1,000 hours	N/mm ² 3.5 (psi) (500)

Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22°C.

Environment	°C	% of initial strength		
		168 h	336 h	720 h
Condensing Humidity	50	75	50	20
Water/glycol	87	-----	-----	30
Gasoline	87	-----	-----	10
Motor oil (5W30)	87	-----	-----	100

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 Safety Data Sheet (SDS).

Directions for use:

- To obtain best results, each application should be evaluated under the specific conditions anticipated for dispensing, performance and durability of the parts.
- The activator should be used sparingly.
- Applied amounts of 0.0008 g/cm² of Activator 7380™ have been shown to give good fixture performance and durability with LOCTITE® AA 3920™.
- LOCTITE® can supply application equipment for Activator 7380™.
- Higher quantities of activator may be needed for gaps greater than 0.38 mm, but poor durability may result from excessive amounts of activator.
- The best UV cure response will occur with wavelengths of light centered around 365 nm with a surface irradiance higher than 80 mW/cm².
- Sufficient exposure time must be allowed for best cure-through depth and to achieve a tack free surface.

Loctite Material Specification^{LMS}

LMS dated April 21, 2004. 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. Storage information may be indicated on the product container labeling.

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 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.

Conversions

(°C x 1.8) + 32 = °F
 kV/mm x 25.4 = V/mil
 mm / 25.4 = inches
 μm / 25.4 = mil
 N x 0.225 = lb
 N/mm x 5.71 = lb/in
 N/mm² x 145 = psi
 MPa x 145 = psi
 N·m x 8.851 = lb·in
 N·m x 0.738 = lb·ft
 N·mm x 0.142 = oz·in
 mPa·s = 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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Reference 1.4