

## LOCTITE® AA 331

Known as LOCTITE® 331  
December 2020

### PRODUCT DESCRIPTION

LOCTITE® AA 331 provides the following product characteristics:

|                             |                                                                                                                                                                                             |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Technology</b>           | Acrylic                                                                                                                                                                                     |
| <b>Chemical Type</b>        | Modified acrylic                                                                                                                                                                            |
| <b>Appearance (uncured)</b> | light yellow to sand yellow paste                                                                                                                                                           |
| <b>Components</b>           | One component - requires no mixing                                                                                                                                                          |
| <b>Viscosity</b>            | Medium                                                                                                                                                                                      |
| <b>Cure</b>                 | Activator                                                                                                                                                                                   |
| <b>Secondary Cure</b>       | Heat                                                                                                                                                                                        |
| <b>Application</b>          | Bonding                                                                                                                                                                                     |
| <b>Specific Benefits</b>    | <ul style="list-style-type: none"> <li>• non-corrosive</li> <li>• Rapid room temperature cure</li> <li>• High temperature resistance</li> <li>• High shear &amp; impact strength</li> </ul> |

LOCTITE® AA 331 is a toughened acrylic adhesive with medium viscosity. This adhesive is designed for bonding metal substrates and is well suited for DC motor assembly, magnet bonding, and bonding of pre-coated sheet metal. The cured product provides high shear and impact strength with excellent environmental and chemical resistance.

### TYPICAL PROPERTIES OF UNCURED MATERIAL

|                                                                    |        |
|--------------------------------------------------------------------|--------|
| Specific Gravity @ 23°C                                            | 1.08   |
| Viscosity, Cone & Plate, 25°C,<br>PHYSICA MK22 @ 5 s <sup>-1</sup> | 19,000 |

### TYPICAL CURING PERFORMANCE

#### Fixture Time

Fixture time is defined as the time to develop a shear strength of 0.1 N/mm<sup>2</sup>.

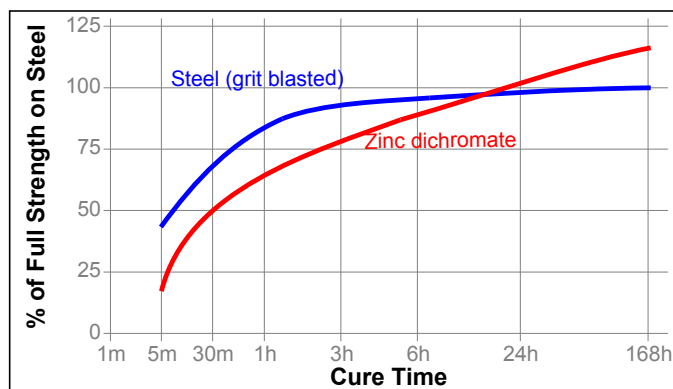
Fixture Time @ 23°C, ISO 4587, seconds:

Grit Blasted Mild Steel, with Activator 7387™ on 1 side:

|              |     |
|--------------|-----|
| 0.05 mm gap  | 17  |
| 0.127 mm gap | 67  |
| 0.25 mm gap  | 142 |

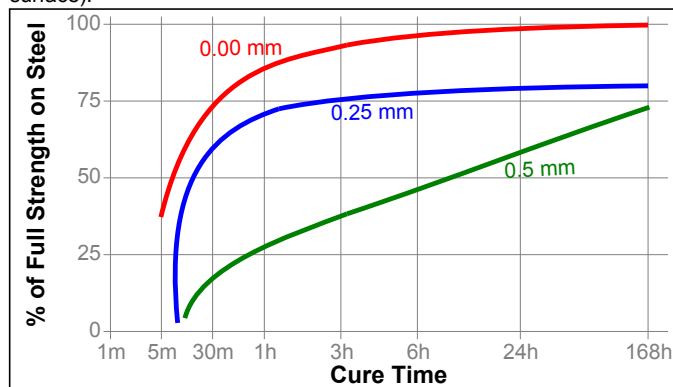
#### Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the shear strength developed with time @ 23°C on grit blasted steel lap shears compared to different materials and tested according to ISO 4587. (Activator 7387™ applied to one surface).



#### Cure Speed vs. Bond Gap

The rate of cure will depend on the bond-line gap. The graph below shows the shear strength developed with time @ 23°C on grit blasted steel lap shears compared to different controlled gaps and tested according to ISO 4587. (Activator 7387™ applied to one surface).



### TYPICAL PERFORMANCE OF CURED MATERIAL

#### Physical Properties

Cured for 48 hours @ 23°C then 3 hours @ 80°C; tested @ 23°C:

|                                              |      |
|----------------------------------------------|------|
| Glass Transition Temperature (Tg) by TMA, °C | 64   |
| Shore Hardness, ISO 868, Durometer D         | 86   |
| Water Absorption, ISO 62, %:                 |      |
| 2 hours in boiling water                     | 0.78 |
| Linear Shrinkage, ISO 1675, %                | 2.4  |
| Volume Shrinkage, ISO 1675, %                | 7.1  |
| Elongation, at break, ISO 527-3, %           | 3.0  |

|                                       |                   |           |
|---------------------------------------|-------------------|-----------|
| Tensile Strength, at break, ISO 527-3 | N/mm <sup>2</sup> | 11        |
|                                       | (psi)             | (1,600)   |
| Tensile Modulus, ISO 527-3            | N/mm <sup>2</sup> | 900       |
|                                       | (psi)             | (130,000) |

**Adhesive Properties**

Cured for 24 hours @ 23°C, Activator 7387™ on 1 side:

Lap Shear Strength, ISO 4587:

Steel :

|             |                   |         |
|-------------|-------------------|---------|
| 0.05 mm gap | N/mm <sup>2</sup> | 13.8    |
|             | (psi)             | (2,000) |

Cured for 48 hours @ 23°C, Activator 7387™ on 1 side

Lap Shear Strength, ISO 4587:

Steel (grit blasted):

|              |                   |         |
|--------------|-------------------|---------|
| 0.127 mm gap | N/mm <sup>2</sup> | 17      |
|              | (psi)             | (2,500) |

|             |                   |         |
|-------------|-------------------|---------|
| 0.25 mm gap | N/mm <sup>2</sup> | 14      |
|             | (psi)             | (2,000) |

|             |                   |         |
|-------------|-------------------|---------|
| 0.38 mm gap | N/mm <sup>2</sup> | 11      |
|             | (psi)             | (1,600) |

180° Peel Strength, ISO 8510-2:

Steel (grit blasted)

|         |      |
|---------|------|
| N/mm    | 3.3  |
| (lb/in) | (19) |

"T" Peel Strength, ISO 11339:

Aluminum (grit blasted)

|         |      |
|---------|------|
| N/mm    | 1.7  |
| (lb/in) | (10) |

Cured for 48 hours @ 23°C, Activator 7387™ on 2 sides:

Lap Shear Strength, ISO 4587:

Steel (grit blasted):

|              |                   |         |
|--------------|-------------------|---------|
| 0.127 mm gap | N/mm <sup>2</sup> | 21      |
|              | (psi)             | (3,000) |

|             |         |         |
|-------------|---------|---------|
| 0.25 mm gap | N/mm    | 18      |
|             | (lb/in) | (2,700) |

|             |         |         |
|-------------|---------|---------|
| 0.38 mm gap | N/mm    | 16      |
|             | (lb/in) | (2,300) |

Block Shear Strength, ISO 13445:

Ferrite Magnet to Mild steel:

|             |                   |         |
|-------------|-------------------|---------|
| 0.05 mm gap | N/mm <sup>2</sup> | 12      |
|             | (psi)             | (1,700) |

Impact Strength, ISO 9653, J:

Ferrite Magnet to Mild steel

2.3

**TYPICAL ENVIRONMENTAL RESISTANCE**

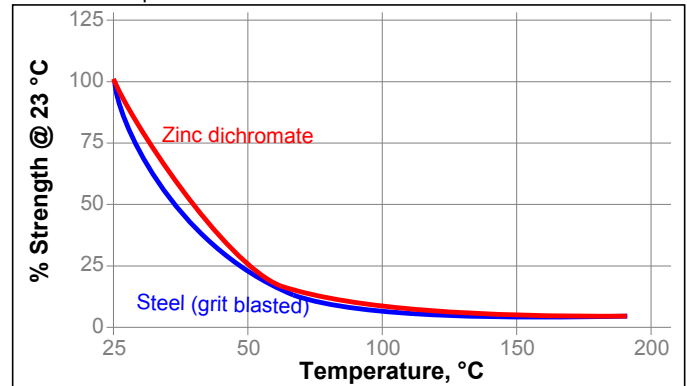
Cured for 1 week @ 23°C, Activator 7387™ on 1 side

Lap Shear Strength, ISO 4587:

Steel (grit blasted)

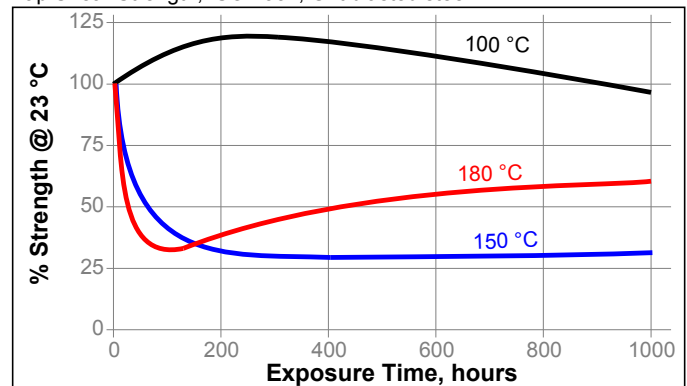
**Hot Strength**

Tested at temperature

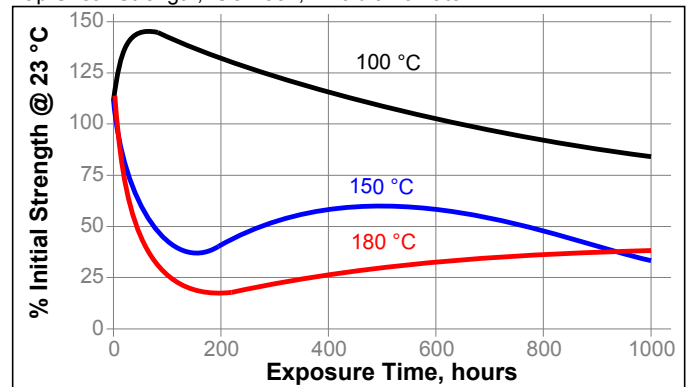
**Heat Aging**

Aged at temperature indicated and tested @ 23°C.

Lap Shear Strength, ISO 4587, Grit blasted steel



Lap Shear Strength, ISO 4587, Zinc dichromate

**Chemical/Solvent Resistance**

Aged under conditions indicated and tested @ 23 °C.

| Environment        | °C | % of initial strength |       |        |
|--------------------|----|-----------------------|-------|--------|
|                    |    | 100 h                 | 500 h | 1000 h |
| Motor oil          | 87 | 157                   | 138   | 130    |
| Air                | 40 | 110                   | 100   | 99     |
| ATF                | 87 | 85                    | 118   | 138    |
| Water/glycol 50/50 | 87 | 148                   | 63    | 42     |

**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).**

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

This product is not normally recommended for use on plastics (particularly thermoplastic materials where stress cracking of the plastic could result). Users are recommended to confirm compatibility of the product with such substrates.

**Directions for Use:**

1. For best performance bond surfaces should be clean and free from grease and other contaminants.
2. To ensure a fast and reliable cure, Activator 7387™ should be applied to one of the bond surfaces and the adhesive to the other surface. Parts should be assembled within two hours.
3. Where bond gaps are large (up to a maximum of 0.5 mm), or faster cure speed is required, Activator 7387™ should be applied to both surfaces. Parts should be assembled immediately (within 1 minute).
4. Excess adhesive can be wiped away with organic solvent.
5. Bond should be held clamped until adhesive has fixtured.
6. 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 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 Henkel representative.

**Product Specification**

The technical data contained herein are intended as reference only and are not considered specifications for the product. Product specifications are located on the Certificate of Analysis or please contact Henkel representative.

**Approval and Certificate**

Please contact Henkel representative for related approval or certificate of this product.

**Data Ranges**

The data contained herein may be reported as a typical value. Values are based on actual test data and are verified on a periodic basis.

Temperature/Humidity Ranges: 23°C / 50% RH = 23±2°C / 50±5% RH

**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

**Disclaimer**

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.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

**In case products are delivered by Henkel Belgium NV, Henkel Electronic Materials NV, Henkel Nederland BV, Henkel Technologies France SAS and Henkel France SA please additionally note the following:**

In case Henkel would be nevertheless held liable, on whatever legal ground, Henkel's liability will in no event exceed the amount of the concerned delivery.

**In case products are delivered by Henkel Colombiana, S.A.S. the following disclaimer is applicable:**

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. Henkel is 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.

Any liability in respect of the information in the Technical Data Sheet or any other written or oral recommendation(s) regarding the concerned product is excluded, except if otherwise explicitly agreed and except in relation to death or personal injury caused by our negligence and any liability under any applicable mandatory product liability law.

**In case products are delivered by Henkel Corporation or Henkel Canada, Inc. the following disclaimer is applicable:**

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, **Henkel Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Henkel Corporation's products. Henkel Corporation specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits.** The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license under any Henkel Corporation patents that may cover such processes or compositions. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide. This product may be covered by one or more United States or foreign patents or patent applications.

**Trademark usage**

Except as otherwise noted, all trademarks in this document are trademarks of Henkel Corporation in the U.S. and elsewhere. ® denotes a trademark registered in the U.S. Patent and Trademark Office.

Reference 0.4