



勝特力材料 886-3-5753170  
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 Http://www.100y.com.tw

# Output 315

December 2003

## PRODUCT DESCRIPTION

LOCTITE® Output™ 315 provides the following product characteristics:

|                              |                                    |
|------------------------------|------------------------------------|
| <b>Technology</b>            | Acrylic                            |
| <b>Chemical Type</b>         | Modified acrylic                   |
| <b>Appearance (uncured)</b>  | Blue paste <sup>LMS</sup>          |
| <b>Components</b>            | One component - requires no mixing |
| <b>Cure</b>                  | Activator                          |
| <b>Application</b>           | Bonding                            |
| <b>Operating Temperature</b> | -54°C to +150°C                    |

Output 315 is a UV thermally conductive, one part adhesive for bonding electrical components to heat sinks with an insulating gap.

## TYPICAL PROPERTIES OF UNCURED MATERIAL

|                               |                                   |
|-------------------------------|-----------------------------------|
| Specific Gravity @ 25°C       | 1.66                              |
| Flash Point (TCC), °C         | >93                               |
| Viscosity @ 25°C, mPa·s:      |                                   |
| Brookfield HBT:               |                                   |
| Spindle TF @ 20 rpm, Helipath | 360,000 to 850,000 <sup>LMS</sup> |

## TYPICAL PROPERTIES OF CURED MATERIAL

### Physical Properties:

|   |       |
|---|-------|
| Coefficient of Thermal Expansion, ppm/°C                  | 69.00 |
| Coefficient of Thermal Conductivity, W/mK                 | 0.808 |
| Tensile Strength, at break, ASTM D 882, N/mm <sup>2</sup> | 15    |
| Elongation, at break, ASTM D 882, %                       | 1     |
| Modulus, ASTM D 882, N/mm <sup>2</sup>                    | 2,690 |

### Electrical Properties:

|   |                     |
|---|---------------------|
| Dielectric Constant / Loss, ASTM D 150: |                     |
| 100 Hz                                  | 6.17 / 0.09         |
| 1kHz                                    | 5.62 / 0.04         |
| 1mHz                                    | 4.99 / 0.03         |
| Volume Resistivity, ASTM D 257, Ω       | 13×10 <sup>11</sup> |
| Surface Resistivity, ASTM D 257, Ω      | 12×10 <sup>12</sup> |
| Dielectric Strength, ASTM D 149, kV/mm  | 38                  |

## PERFORMANCE OF CURED MATERIAL

After 1 hr at 22°C, Act. 7387 on 1 side.

### Adhesive Properties:

|   |                      |
|---|----------------------|
| Tensile Shear, N/mm <sup>2</sup> :<br>Steel/steel | ≥3.40 <sup>LMS</sup> |
|---|----------------------|

After 24 hr at 22°C, Act. 7387 on 1 side.

### Adhesive Properties:

|   |                      |
|---|----------------------|
| Tensile Shear, N/mm <sup>2</sup> :<br>Steel/steel | ≥5.50 <sup>LMS</sup> |
| Steel/steel, 0.5mm gap                            | ≥5.50                |

## TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 72 hours with Output Activator on 1 side.

### Adhesive Properties:

|  |  |
|--|--|
| Shear Strength, ASTM D 1002, N/mm <sup>2</sup> :<br>Steel to steel |  |
|--|--|

## Chemical/Solvent Resistance

Aged under conditions indicated and tested at 22°C.

| Environment | °C | % of initial strength |
|-------------|----|-----------------------|
|             |    | 720 hr                |
| Air         | 87 | 140                   |
| Water       | 87 | 76                    |
| Freon TF    | 87 | 85                    |

## Thermal Cycle Resistance

Bonded aluminum to epoxyglass lapshears cured 72 hours using Output Activator on one side were subjected to thermal cycling of 15°C to 100°C with a ramp time of 30 minutes. No loss in strength occurred after 1000 hours of cycle time.

## 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

- For best performance bond surfaces should be clean and free from grease.
- Use applicator to apply the activator to the surface to be bonded.
- After the solvent evaporates, the active ingredients will appear wet, and will remain active for up to two hours after application. Contamination of the surface before bonding should be prevented.
- Apply adhesive to the unactivated surface.
- Secure the assembly, and wait for the adhesive to fixture (approximately 5 minutes) before any further handling. Full cure occurs in 4 - 24 hours.
- The amount of adhesive applied to the part or heat sink should be limited to the amount necessary to fill the bond and just enough to give a small fillet.
- The dispensing or application of the adhesive should be done as to minimize air entrapment within the bondline.
- The successful application of this product depends on accurate dispensing on the parts to be bonded. Loctite Equipment Engineers are available to assist you in selecting and implementing the appropriate dispensing equipment for your application.

## Loctite Material Specification<sup>LMS</sup>

LMS dated FEB 6, 2002. 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.

**Note**

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 Loctite 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 Loctite Corporation's products. Henkel Loctite 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 Loctite 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.

**Conversions**

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$

$\text{kV/mm} \times 25.4 = \text{V/mil}$

$\text{mm} \times 0.039 = \text{inches}$

$\text{mPas} = \text{cP}$

$\text{N/mm}^2 \times 145 = \text{psi}$

$\text{N} \times 0.225 = \text{lbs}$

**Storage**

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

**Products shall be maintained at temperatures between 2°C to 8°C unless otherwise labeled, or, specified. Storage, at temperatures below 2°C, or, greater than 8°C, is not recommended. Temperatures below 2°C and above 8°C can adversely affect product properties.**

Material removed from containers may be contaminated during use. Do not return product to the original container. Loctite 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.

**Trademark usage**

LOCTITE is a Trademark of Henkel Loctite

Output is a Trademark of Henkel Loctite

Reference 0.2

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## Product Description Sheet

# Depend<sup>®</sup> 7387 Activator

Industrial Products, July 1999

### PRODUCT DESCRIPTION

LOCTITE<sup>®</sup> Depend<sup>®</sup> 7387 Activator is a solvent based activator designed for use with Loctite Output thermally conductive adhesives. Depend Activator is required for proper curing of Depend adhesives.

### TYPICAL APPLICATIONS

Output Activator is one component of a 2 part no mix adhesive system for heat dissipation in electronic applications

### LIQUID PROPERTIES

|                              | Typical Value                  |
|------------------------------|--------------------------------|
| Chemical Type                | Heptane/Isopropanol            |
| Appearance                   | Amber to Light Brown<br>Liquid |
| Specific Gravity @ 25°C      | 0.8                            |
| Viscosity @ 25°C, mPa.s (cP) | 1.5                            |
| Flash Point (TCC), °C        | -4 (HIGHLY FLAMMABLE)          |

### GENERAL INFORMATION

**This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be used with a sealant for chlorine or other strong oxidizing materials.**

**For safe handling information on this product, consult the Material Safety Data Sheet (MSDS).**

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 activator and adhesive. In some cases these aqueous washes can affect the cure and performance of these materials. This product may contribute to stress cracking of certain plastics. Users are recommended to confirm compatibility of the product with such substrates.

### Caution

OUTPUT ACTIVATOR IS HIGHLY FLAMMABLE

KEEP AWAY FROM FLAMES OR OTHER SOURCES OF IGNITION. ONLY NITROGEN OR ARGON SHOULD BE USED WHEN DISPENSING THIS MATERIAL FROM A PRESSURIZED SYSTEM.

NEVER MIX ACTIVATOR AND ADHESIVE DIRECTLY AS LIQUIDS.

### Directions for use

1. Use applicator provided to apply the activator by drops on one or both mating surfaces to be bonded. Contaminated surfaces may require cleaning prior to activation to remove any dissolvable contamination.

NOTE: On some highly stressed plastics, stress crazing may occur before solvent evaporates.

2. After the solvent evaporates, the active ingredients will appear wet, and will remain active up to two hours after application. Contamination of the surface before bonding should be prevented.

3. Apply the Output adhesive product to one or both surfaces and assemble parts immediately. Hold firmly from one to three minutes.

NOTE Poorly fitted parts may require up to five minutes of holding time.

4. When activator is applied to only one surface, apply the adhesive to the non-activated surface.
5. Where possible, move surfaces in relation to each other for a few seconds on the assembly to properly distribute the adhesive, and to achieve maximum activation.
6. Secure the assembly, and wait for adhesive to fixture before any further handling. Full cure occurs in 4 -24 hours, depending on the gap between the mating parts.

### Storage

Product shall be ideally stored in a cool, dry location in unopened containers at a temperature between 8°C to 28°C (46°F to 82°F) unless otherwise labeled. Optimal storage is at the lower half of this temperature range. To prevent contamination of unused product, do not return any material to its original container. For further specific shelf life information, contact your local Technical Service Center. This product is classified as being **highly flammable** and must not be stored near oxidizing agents or combustible materials. Always seal activator's bottle immediately after use.

### Note

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, **Loctite Corporation specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Loctite Corporation's products. Loctite 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 Loctite 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.

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