PRODUCT DESCRIPTION
LOCTITE® 290™ provides the following product characteristics:

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology</td>
<td>Acrylic</td>
</tr>
<tr>
<td>Chemical Type</td>
<td>Dimethacrylate ester</td>
</tr>
<tr>
<td>Appearance (uncured)</td>
<td>Green liquid&lt;sup&gt;MS&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fluorescence</td>
<td>Positive under UV light&lt;sup&gt;MS&lt;/sup&gt;</td>
</tr>
<tr>
<td>Components</td>
<td>One component - requires no mixing</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Low</td>
</tr>
<tr>
<td>Cure</td>
<td>Anaerobic</td>
</tr>
<tr>
<td>Secondary Cure</td>
<td>Activator</td>
</tr>
<tr>
<td>Application</td>
<td>Threadlocking</td>
</tr>
<tr>
<td>Strength</td>
<td>Medium to High</td>
</tr>
</tbody>
</table>

LOCTITE® 290™ is designed for the locking and sealing of threaded fasteners. Because of its low viscosity and capillary action, the product wicks between engaged threads and eliminates the need to disassemble prior to application. The product cures when confined in the absence of air between close fitting metal surfaces and prevents loosening and leakage from shock and vibration. The product can also fill porosity in welds, castings and powdered metal parts.

Mii-S-46163A
LOCTITE® 290™ is tested to the lot requirements of Military Specification Mii-S-46163A.

ASTM D5363
Each lot of adhesive produced in North America is tested to the general requirements defined in paragraphs 5.1.1 and 5.1.2 and to the Detail Requirements defined in section 5.2.

TYPICAL PROPERTIES OF UNCURED MATERIAL
Specific Gravity @ 25 °C 1.08
Flash Point - See MSDS
Viscosity, Brookfield - RVT, 25 °C, mPa·s (cP):
  Spindle 1, speed 50 rpm 20 to 55<sup>MS</sup>

TYPICAL CURING PERFORMANCE
Cure Speed vs. Substrate
The rate of cure will depend on the substrate used. The graph below shows the breakaway strength developed with time on M10 steel nuts and bolts compared to different materials and tested according to ISO 10964.

Cure Speed vs. Bond Gap
The rate of cure will depend on the bondline gap. Gaps in threaded fasteners depends on thread type, quality and size. The following graph shows shear strength developed with time on steel pins and collars at different controlled gaps and tested according to ISO 10123.

Cure Speed vs. Temperature
The rate of cure will depend on the temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 steel nuts and bolts and tested according to ISO 10964.
Cure Speed vs. Activator
Where cure speed is unacceptably long, or large gaps are present, applying activator to the surface will improve cure speed. The graph below shows the breakaway strength developed with time on M10 zinc dichromate steel nuts and bolts using Activator 7471™ and 7649™ and tested according to ISO 10964.

TYPICAL PROPERTIES OF CURED MATERIAL
Physical Properties:
- Coefficient of Thermal Expansion, ISO 11359-2, K⁻¹: 80×10⁻⁴
- Coefficient of Thermal Conductivity, ISO 8302, W/(m·K): 0.1
- Specific Heat, kJ/(kg·K): 0.3

TYPICAL PERFORMANCE OF CURED MATERIAL
Adhesive Properties
After 24 hours @ 22 °C
- Breakaway Torque, ISO 10964:
  - M10 steel nuts and bolts: N·m 10 (lb.in.) (90)
- Prevail Torque, ISO 10964:
  - M10 steel nuts and bolts: N·m 29 (lb.in.) (260)
- Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m:
  - M10 steel nuts and bolts: N·m 30 (lb.in.) (270)
- Max. Prevail Torque, ISO 10964, Pre-torqued to 5 N·m:
  - M10 steel nuts and bolts: N·m 40 (lb.in.) (350)
- Compressive Shear Strength, ISO 10123:
  - Steel pins and collars: N/mm² ≥5.4 LMS (psi) (≥780)

TYPICAL ENVIRONMENTAL RESISTANCE
Cured for 1 week @ 22 °C
- Breakloose Torque, ISO 10964, Pre-torqued to 5 N·m:
  - M10 zinc phosphate steel nuts and bolts:

TDS LOCTITE® 290™, August 2007

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For the most direct access to local sales and technical support visit: www.loctite.com
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
For Pre-assembled Threaded Parts with Thru Holes
1. Prior to assembly, clean all threads (bolt and hole) with a LOCTITE® cleaning solvent and allow to dry.
2. For Thru Holes, apply several drops of product at screw and body juncture.
3. Avoid touching the bottle tip to the metal surface.

For Assembly
1. For Blind Holes, apply several drops of the product down the internal threads to the bottom of the hole

For Porosity Sealing
1. Clean area and apply localized heat to the area to approximately 121°C.
2. Allow to cool to approximately 85°C and apply the product.

For Disassembly
1. Remove with standard hand tools.
2. In rare instances where hand tools do not work because of excessive engagement length, apply localized heat to nut or bolt to approximately 250 °C. Disassemble while hot.

For Cleanup
1. Cured product can be removed with a combination of soaking in a LOCTITE® solvent and mechanical abrasion such as a wire brush.

Loctite Material Specification
LMS dated September 01, 1995. 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 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.

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Reference 0.5