Product DL2040

TALLAGHT BUSINESS PARK,
DUBLIN, IRELAND

PRELIMINARY

January 2001

NOT FOR PRODUCT SPECIFICATIONS.
THE TECHNICAL DATA CONTAINED HEREIN ARE INTENDED AS REFERENCE ONLY.
Pleased contact LOCTITE CORPORATION QUALITY DEPARTMENT FOR ASSISTANCE AND RECOMMENDATIONS ON SPECIFICATIONS FOR THIS PRODUCT.

Research, Development & Engineering

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TYPICAL APPLICATIONS
Prevents loosening of threaded fasteners. Particularly suitable in situations where threaded parts are required to be ready for immediate use in an adhesive joint in a high volume production environment where it may not be possible to apply a liquid product on line. When cured this product will also act as a thread sealant.

PROPERTIES OF UNCURED COATING MATERIAL
Pre-applied (Dry film) coating

Chemical Type: Methylacrylate Ester
Appearance: Soft dry pink, fluorescent preapplied film
Flash Point (TCC), °C: > 100
Lubricity, DIN 946: K factor (Torque/Tension)
M10 x 1.5 Black Oxide Bolts: 0.29
M10 x 1.5 Zinc dichromate Bolts: 0.30

TYPICAL CURING PERFORMANCE

Cure speed vs substrate
This product has a similar cure profile for various metal substrates. The graph below shows the breakaway strength developed with time on M10 x 1.5 black oxide bolts and steel nuts compared to different materials and tested according to ISO-10964.

Cure speed vs temperature
The rate of cure will depend on the ambient temperature. The graph below shows the breakaway strength developed with time at different temperatures on M10 x 1.5 black oxide bolts and steel nuts and tested according to ISO-10964.

TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties
Coefficient of thermal expansion, ASTM D696, K-1
Coefficient of thermal conductivity, ASTM C177, W.m-1 K-1
Specific Heat, kJ.kg-1 K-1

PERFORMANCE OF CURED MATERIAL

After 24 hr at 22°C on unseated nuts & bolts DIN 267 pt. 27 using M10 x 1.5 steel bolts.

Typical Value Range
Breakaway Torque, DIN 267 Part 27, N.m 16 13-18
Loosening Torque, DIN 267 Part 27, N.m 27 23-31

Torque Augmentation
Breakloose torque of an uncoated fastener will normally be 15 to 30% less than the on-torque. Using LOCTITE 2040, breakloose torque is at least 20% greater than the on torque as shown in the graph below.
TYPICAL ENVIRONMENTAL RESISTANCE

Test Procedure: Breakaway Torque Unseated
Substrate: M10
Cure procedure: 72 hours at 22°C

Hot Strength
Steel M10x1.5 tested at temperature per ISO 10964.

Heat Ageing
Steel M10 x 1.5 aged at temperature, tested at 22°C, ISO 10964.

Chemical / Solvent Resistance
Unseated M10 x 1.5 black oxide bolts and steel nuts were allowed to cure for 72 hours and then aged under conditions indicated and tested at 22°C according to DIN 267 part 27.

<table>
<thead>
<tr>
<th>Solvent</th>
<th>Temp.</th>
<th>% Initial Strength retained at 100 hr</th>
<th>% Initial Strength retained at 500 hr</th>
<th>% Initial Strength retained at 1000 hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Oil</td>
<td>120°C</td>
<td>70</td>
<td>70</td>
<td>45</td>
</tr>
<tr>
<td>Motor Oil</td>
<td>150°C</td>
<td>55</td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td>Unleaded Petrol</td>
<td>22°C</td>
<td>85</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>Brake Fluid</td>
<td>90°C</td>
<td>85</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>Water/Glycol (50%/50%)</td>
<td>120°C</td>
<td>90</td>
<td>70</td>
<td>40</td>
</tr>
<tr>
<td>Transmission Fluid</td>
<td>120°C</td>
<td>70</td>
<td>70</td>
<td>40</td>
</tr>
<tr>
<td>Transmission Fluid</td>
<td>150°C</td>
<td>65</td>
<td>55</td>
<td>35</td>
</tr>
<tr>
<td>Gear Oil</td>
<td>120°C</td>
<td>75</td>
<td>70</td>
<td>55</td>
</tr>
</tbody>
</table>

Standards
This product meets the requirements of DIN 267 part 27 on seated and unseated grade 8.8 M10 mild steel, zinc dichromate and zinc phosphate bolts. Product DL2040 performs close to or surpasses the environmental resistance requirements of DIN 267 part 27.

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 oxidising materials.

This product is not normally recommended for use on brass or copper surfaces or 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
This coating is produced from an aqueous two component system consisting of a liquid binder and microencapsulated chemical initiators. The components are coated onto threads at approved Loctite coating centres. Details are available from your local Technical Service Centre.

The coated fastener is ready for immediate use and can be assembled to its mating threaded component at any time within its on-part shelf life period. For best performance the mating surface should be clean and free of grease. Product is normally pre-applied to the bolt in sufficient quantity to fill all engaged threads. Very large thread sizes may create gaps which will affect performance. After assembly and cure a fastener coated with 2040 should not be re-used if the joint is disassembled. In the case of disassembly a fastener coated with 2040 or a liquid threadlocker of similar performance should be used.

Storage
Coated fasteners shall be ideally stored in a dry location at a temperature between 8°C - 28°C (46°F - 82°F). For further specific shelf-life information, contact your local Technical Service Centre.

Data Ranges
The data contained herein may be reported as a typical value and/or range (based on the mean value ±2 standard deviations). Values are based on actual test data and are verified on a periodic basis.

Note
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