LOCTITE® 668™

January 2005

PRODUCT DESCRIPTION

LOCTITE® 668™ provides the following product characteristics:

Technology	Acrylic
Chemical Type	Methacrylate ester
Appearance (uncured)	Green, wax consistency[LMS]
Appearance (form)	Stick
Fluorescence	Positive under UV light[LMS]
Components	One component - requires no mixing
Cure	Anaerobic
Secondary Cure	Activator
Application	Retaining
Strength	Low to medium

LOCTITE® 668™ is designed for the bonding of cylindrical fitting parts. As with liquid anaerobic products, this material develops its cured properties in the absence of air when confined between close fitting metal surfaces. It is supplied as a wax-like semi-solid, conveniently packaged in a self-feeding stick applicator. It is particularly well suited for applications where a liquid product may be too fluid to stay on a part or be difficult to apply. It stores easily and allows for direct contact to metal parts during application to ensure even coverage.

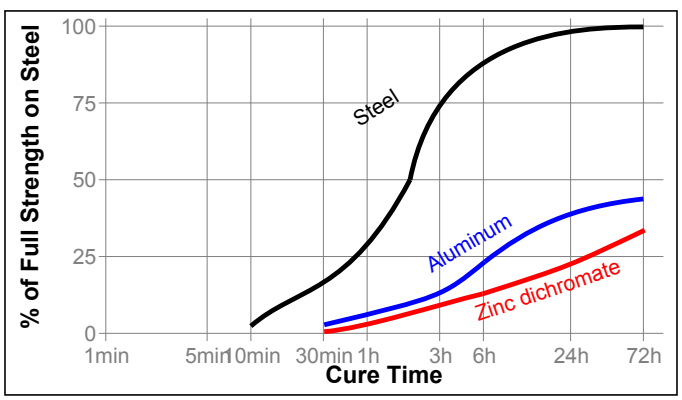
TYPICAL PROPERTIES OF UNCURED MATERIAL

Flash Point - See MSDS	
Unworked Penetration, ISO 2137, 1/10 mm	70 to 130[LMS]

TYPICAL CURING PERFORMANCE

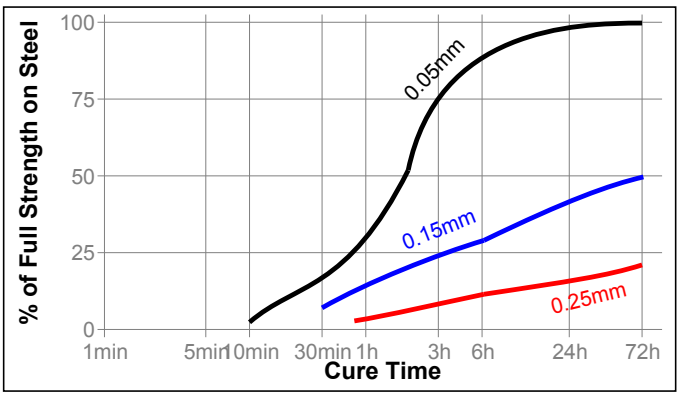
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the shear strength developed with time on steel pins and collars compared to different materials and tested according to ISO 10123.



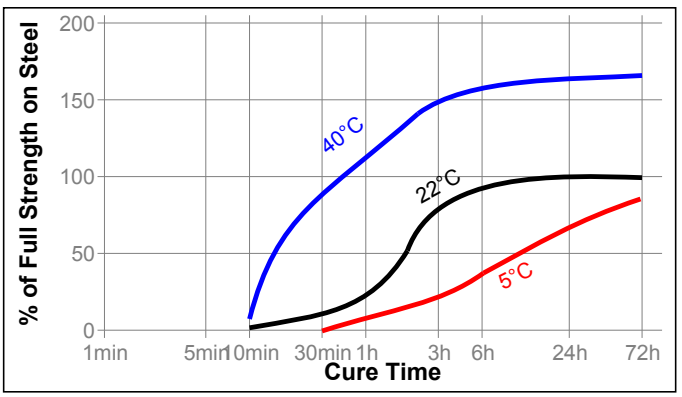
Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. The following graph shows shear strength developed with time on steel pins and collars at different controlled gaps and tested according to ISO 10123.



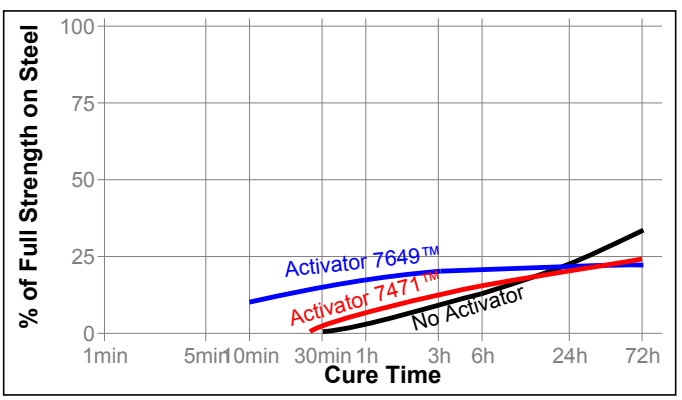
Cure Speed vs. Temperature

The rate of cure will depend on the temperature. The graph below shows the shear strength developed with time at different temperatures on steel pins and collars and tested according to ISO 10123.



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 shear strength developed with time using Activator 7471™ and 7649™ on zinc dichromate steel pins and collars and tested according to ISO 10123.



TYPICAL PROPERTIES OF CURED MATERIAL

Physical Properties:

Coefficient of Thermal Expansion, ASTM D 696, K^{-1} 61×10^{-6}

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 24 hours @ 22 °C

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm²	≥7[LMS]
	(psi)	(≥1,015)

Cured for 24 hours @ 22 °C, followed by 24 hours @ 177 °C, tested @ 22 °C

Compressive Shear Strength, ISO 10123:

Steel pins and collars	N/mm²	≥18[LMS]
	(psi)	(≥2,610)

TYPICAL ENVIRONMENTAL RESISTANCE

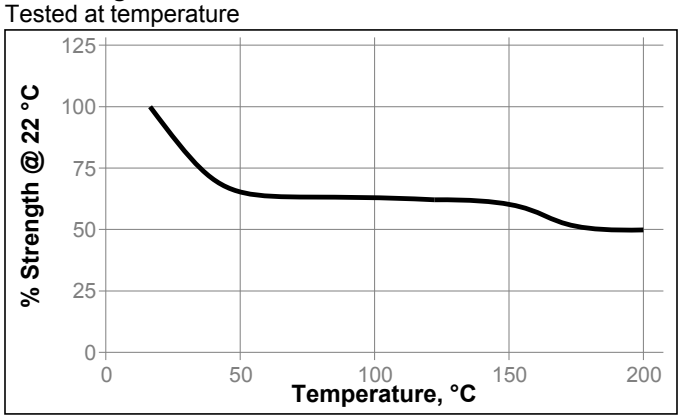
Cured for 1 week @ 22 °C

Compressive Shear Strength, ISO 10123:

Steel pins and collars

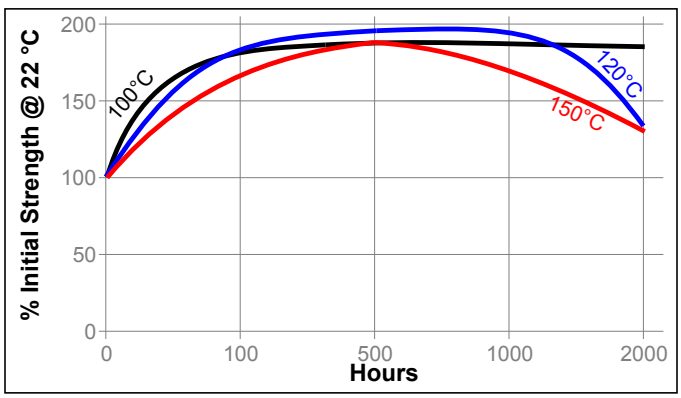
Hot Strength

Tested at temperature



Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ 22 °C.

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
Motor oil	125	170	160	180
Unleaded gasoline	22	85	80	85
Brake fluid	22	110	80	90
Water/glycol 50/50	87	145	155	160
Ethanol	22	90	75	70
Acetone	22	80	55	55

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).

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

For Assembly

1. For best results, clean all surfaces (external and internal) with a Loctite® cleaning solvent and allow to dry.
2. Advance only enough product to use at the time of application.
3. If present, remove any visible contaminants on the top of the stick prior to application.
4. **For Slip Fitted Assemblies**
   a. For applications with a diameter less than approximately 40 mm, apply product to the pin (inner component) around the entire circumference of the surface being bonded (e.g. pin exterior). Product should be applied at the point where the bonded components will ultimately be positioned. For best results, rotate either part during assembly to ensure full coverage of the product in the engagement area.
   b. For applications with a diameter greater than approximately 40 mm, it is recommended to apply stick product around the entire circumference of both surfaces being bonded (e.g. pin and collar). Product should be applied at the point where the bonded components will ultimately be positioned. For best results, rotate either part during assembly to ensure full coverage of the product in the engagement area.
5. **For Press Fitted Assemblies,** apply product thoroughly to both bond surfaces and assemble at high press rates to avoid premature curing during assembly.

6. **For Shrink Fitted Assemblies,** apply product around the entire circumference of the innermost surface being bonded (i.e. pin). Product should be applied at the point where the bonded components will ultimately be mated. Heat collar to achieve sufficient clearance for free assembly of the parts. Position parts and allow to cool.
7. Parts should not be disturbed until sufficient handling strength is achieved.

For Disassembly

1. Apply localized heat to the assembly 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]

LMS dated August 11, 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
N x 0.225 = lb
N/mm x 5.71 = lb/in
N/mm^2 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.

Trademark usage

Reference 1