LOCTITE®5600™Black

July 2007

PRODUCT DESCRIPTION

LOCTITE®5600™Black provides the following product characteristics:

Technology	Silicone
Chemical Type	Alkoxy silicone
Appearance (Part A)	Black paste[LMS]
Appearance (Part B)	White paste[LMS]
Appearance (Mixed)	Black paste
Components	Two component - requires mixing
Mix Ratio, by volume - Part A: Part B	2 : 1
Viscosity	Thixotropic
Cure	Room temperature cure and Atmospheric moisture
Application	Bonding and Sealing

LOCTITE®5600™Black is a two part, fast cure silicone with excellent bond strength to glass, metals and Ceran®. LOCTITE®5600™Black has excellent hot strength up to 180°C. Typical applications include sealing/bonding glass stovetop assemblies, weld and rivet reduction in high temperature applications, and other high temperature bonding applications.

UL Classification

Classified by Underwriters Laboratories Inc.®
QOQW2.E309695 - The adhesive systems have been tested in accordance with UL746C, "Polymeric Materials for use in Electrical Equipment Evaluations" with regard to the effect of environmental conditions, for the surfaces and temperatures indicated in the individual recognitions. Adequate adhesive bond strength must be determined for the particular application on the end product.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A:

Specific Gravity @ 25 °C	1.2 to 1.4[LMS]
Flash Point - See MSDS	
Viscosity, Cone & Plate, mPa·s (cP):	
Spindle CP20-2 Deg @ 20 s^{-1}	40,000 to 90,000

Part B:

Specific Gravity @ 25 °C	1.6 to 1.85[LMS]
Flash Point - See MSDS	
Viscosity, Cone & Plate, mPa·s (cP):	
Spindle CP20-2 Deg @ 20 s^{-1}	30,000 to 80,000

Mixed:

Flash Point - See MSDS

TYPICAL CURING PERFORMANCE

The mix of part A and part B initiates the reaction. There is a secondary cure with atmospheric moisture that promotes full cure over 7 days.

Skin Over Time

Skin over time is the time the surface of the adhesive forms a skin upon exposure to atmospheric moisture at 25 ± 2 °C, 50 ± 5% RH.

Skin Over Time, minutes	≤10[LMS]

Fixture Time

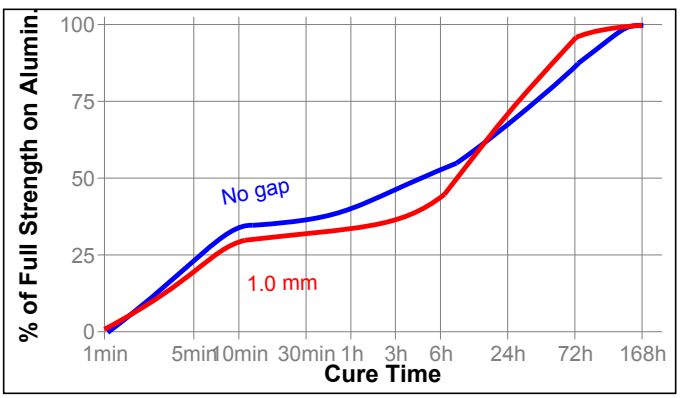
Fixture time is defined as the time to develop a shear strength of 0.1 N/mm² .

Fixture Time, ISO 4587, minutes:

Steel @ 25 °C	5 to 10
Aluminium Alclad @ 25 °C	3.5 to 4

Cure Speed vs. Time

The graph below shows the shear strength developed over time at 22 °C / 50 % RH on aluminum (Alclad) and tested according to ISO 4587.



TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 7 days @ 22 °C / 50% RH

Physical Properties:

Shore Hardness, ISO 868, Durometer A		30 to 50[LMS]
Elongation, at break, ISO 527-3, %		≥120[LMS]
Tensile Strength, ISO 527-3	N/mm² (psi)	≥1.0[LMS] (≥145)
Young's Modulus, ISO 37	N/mm² (psi)	0.81 (118)
Tear Strength, ISO 34-1 , Die C	N/mm (lb./in.)	7.2 (41)
Water Absorption, ISO 62, %:		
24 hour in water @ 22 °C		0.7
Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}		2.02×10^{-4}
Volume Shrinkage, %		0.13
Linear Shrinkage, %		0.04

Electrical Properties:

Dielectric Constant / Dissipation Factor, IEC 60250:	
1 kHz	4.159 / 0.0375
1 MHz	4.144 / 0.0038
Volume Resistivity, IEC 60093, Ω·cm	5.5×10^{14}
Dielectric Breakdown Strength, IEC 60243-1, kV/mm	0.493

TYPICAL PERFORMANCE OF CURED MATERIAL

Cured for 7 days @ 22 °C / 50% RH, 0 gap

Adhesive Properties

180° Peel Strength, ISO 8510-2N/mm (lb/in):

Steel	N/mm (lb/in)	4.2 (24)

Impact Strength, ISO 9653, J:

Aluminum (Alclad)	4.3

Shear Strength:

Lap Shear Strength, ISO 4587:

Aluminum (Alclad)	N/mm² (psi)	≥1.0[LMS] (≥145)
Steel	N/mm² (psi)	2.5 (360)
Stainless steel	N/mm² (psi)	2.1 (310)
Galvanized Steel	N/mm² (psi)	2.5 (360)
Enameled Steel	N/mm² (psi)	1.7 (240)
Glass	N/mm² (psi)	2.0 (300)
Polycarbonate	N/mm² (psi)	1.2 (180)
ABS	N/mm² (psi)	1.7 (240)
PBT (glass filled)	N/mm² (psi)	1.8 (260)
Nylon	N/mm² (psi)	2.2 (320)
Epoxyglass	N/mm² (psi)	2.3 (330)
Steel to Ceran®	N/mm² (psi)	1.8 (260)
Aluminum (Alclad) to Ceran®	N/mm² (psi)	2.1 (300)

Cured for 7 days @ 22 °C / 50% RH and 1.0 mm gap

Impact Strength, ISO 9653, J:

Aluminum (Alclad)	11.9

Shear Strength:

Lap Shear Strength, ISO 4587, N/mm² :

Aluminum (Alclad)	N/mm² (psi)	1.7 (250)
Steel	N/mm² (psi)	1.6 (230)
Stainless steel	N/mm² (psi)	1.5 (220)
Galvanized Steel	N/mm² (psi)	1.5 (220)
Enameled Steel	N/mm² (psi)	2.1 (310)
Glass	N/mm² (psi)	1.1 (160)
Polycarbonate	N/mm² (psi)	0.4 (50)
ABS	N/mm² (psi)	1.5 (210)
PBT (glass filled)	N/mm² (psi)	1.3 (190)
Nylon	N/mm² (psi)	1.1 (160)
Epoxyglass	N/mm² (psi)	1.4 (210)
Steel to Ceran®	N/mm² (psi)	1.4 (200)
Aluminum (Alclad) to Ceran®	N/mm² (psi)	1.7 (250)

TYPICAL ENVIRONMENTAL RESISTANCE

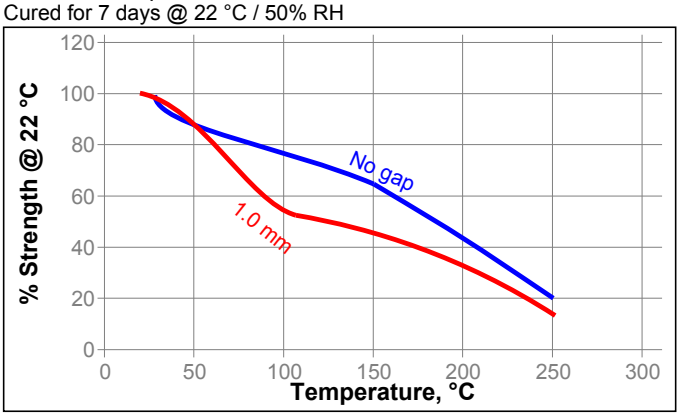
Lap Shear Strength, ISO 4587:

Alclad

Hot Strength

Tested at temperature

Cured for 7 days @ 22 °C / 50% RH



Heat Aging

Aged at temperature indicated and tested @ 22 °C

Aged @ 50 °C for 1,000 hours:	
Change in Tensile Strength, %	-5
Change in Elongation, %	-30
Aged @ 100 °C for 1,000 hours:	
Change in Tensile Strength, %	-25
Change in Elongation, %	-33
Aged @ 150 °C for 1,000 hours:	
Change in Tensile Strength, %	-22
Change in Elongation, %	-30
Aged @ 200 °C for 1,000 hours:	
Change in Tensile Strength, %	14
Change in Elongation, %	-81

Chemical/Solvent Resistance
Cured for 5 days @ 22 °C, on Alclad with 1.0 mm gap, aged under conditions indicated and tested @ 22°C

		% of initial strength	
Environment	**°C**	**500 h**	**1000 h**
Water	25	86	66
Isopropanol	25	62	65
2% Ammonia/Water	25	83	69
Motor oil (10W30)	25	99	109
Water/glycol 50/50	25	97	88

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
1. For best performance the mating surface should be clean and free of grease.
2. Best results are achieved utilizing 10.7mm square, 24 element mix nozzle.
3. After dispense, mate parts immediately to ensure maximum bond strength.
4. **Dual Cartridges:** To use simply insert the cartridge into the application gun and start the plunger into the cylinders using light pressure on the trigger. Next, remove the cartridge cap and dispense the first 3-5cm of mixed adhesive to be sure both part A and part B are flowing. Attach the mix nozzle to the end of the cartridge and begin dispensing onto part. **Bulk Containers:** Utilize volumetric dispense system to ensure proper mix ratio and utilize mix nozzle to obtain adequate mixing.

Loctite Material Specification[LMS]
LMS dated October 12, 2006. 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
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Reference 0.0