



LOCTITE® 5714™

June 2007

PRODUCT DESCRIPTION

LOCTITE® 5714™ provides the following product characteristics:

Technology	Silicone
Chemical Type	Silicone
Appearance (Part A)	White paste ^{LMS}
Appearance (Part B)	Black paste ^{LMS}
Appearance (Mixed)	Black paste
Mix Ratio - Part A:Part B	1 : 1
Components	Two component - requires mixing
Viscosity	Low, thixotropic
Cure	Heat cure
Application	LIM (Fuel Cell) Gasketing
Specific Benefit	Fast curing

LOCTITE® 5714™ is a two component, heat curing, liquid injection molding silicone designed for creating compression seals on bipolar plates, membrane electrode assemblies and other components used in the fabrication of a proton exchange membrane fuel cell (PEMFC). After curing, the sealant functions as a compression gasket, which enables it to make the required gastight seal. LOCTITE® 5714™ is a low ionic formulation that has been specially formulated to be compatible with the membrane electrode assemblies (MEA's). The product was designed for fast cure enabling and fast cycle times in Liquid Injection Molding (LIM) processes.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A:

Specific Gravity @ 25 °C	1.02
Flash Point - See MSDS	
Solids/Non-Volatile Content, %	100
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Spindle CP20-2 Deg @ 12 s ⁻¹	75,000 to 125,000 ^{LMS}

Part B:

Specific Gravity @ 25 °C	1.06
Flash Point - See MSDS	
Solids/Non-Volatile Content, %	100
Viscosity, Cone & Plate, 25 °C, mPa·s (cP):	
Spindle CP20-2 Deg @ 12 s ⁻¹	65,000 to 115,000 ^{LMS}

Mixed:

Specific Gravity @ 25 °C	1.04
Flash Point - See MSDS	
Pot life @ 22 °C, minutes	150

TYPICAL CURING PERFORMANCE

Normal processing conditions will include sufficient exposure to heat to effectively cure the material. Cure time depends upon such factors as the mass of the material dispensed, the heat ramp up rate of the substrate and amount of airflow over the substrate. Minimum cure temperature profile for this product is 110°C. Minimum cure time is approximately 15 minutes.

Differential Scanning Calorimetry

Temperature Program from 25 to 200 °C at 10 °C/minute:

Curing Exotherm, J/g	4.5
Peak Maximum, °C	77

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	135
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TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 15 minutes @ 110 °C

Physical Properties:

Shore Hardness, ISO 868, Durometer A	22 to 32 ^{LMS}
Elongation, ISO 37, %	≥250 ^{LMS}
Tensile Strength, ISO 37	N/mm ² ≥1.3 ^{LMS} (psi) (≥185)
Tensile Modulus, ISO 37	N/mm ² 0.7 (psi) (96)
Tear Strength, ISO 34-1, Die C	N/mm 5.3 (lb./in.) (30)
Compression Set, ASTM D 395, Method B, %:	
Aged @ 75 °C for 70 hours	<5
Glass Transition Temperature (Tg), °C	-48

TYPICAL ENVIRONMENTAL RESISTANCE

Typical Fluid Immersion Properties

Heat Aging

DI Water @ 90 °C for 1,000 hours:	
Change in Durometer, Points (Initial = 26)	-4
Change in Tensile Strength, %	-11
Change in Tensile Modulus, %	6
Change in Elongation, %	7
Water/Glycol @ 90 °C for 1,000 hours:	
Change in Durometer, Points (Initial = 26)	-3
Change in Tensile Strength, %	31
Change in Tensile Modulus, %	18
Change in Elongation, %	28

Sulfuric Acid (pH 2) @ 90 °C for 1,000 hours:

Change in Durometer, Points (Initial = 26)	-3
Change in Tensile Strength, %	-15
Change in Tensile Modulus, %	7
Change in Elongation, %	8

Methanol @ 60 °C for 1,000 hours:

Change in Durometer, Points (Initial = 26)	0
Change in Tensile Strength, %	10
Change in Tensile Modulus, %	20
Change in Elongation, %	22

Air @ 90 °C for 1,000 hours:

Change in Durometer, Points (Initial = 26)	6
Change in Tensile Strength, %	37
Change in Tensile Modulus, %	67
Change in Elongation, %	-1

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 part surfaces should be clean and free of grease.
- Dispense LOCTITE® 5714™ in a 1:1 mix ratio utilizing the appropriate Henkel® cartridge dispenser and static mixing nozzle. Contact your local sales representative or technical service center for dispensing equipment needed per application.
- Excess material can be easily wiped away with non-polar solvents.
- It is recommended that this product be heat cured at 110 °C for 15 minutes.
- Actual cure schedule depends on mass and geometry of parts.

Loctite Material Specification^{LMS}

LMS dated March 19, 2007 (Part A) and LMS dated March 27, 2007 (Part B). 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.

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

$(^{\circ}\text{C} \times 1.8) + 32 = ^{\circ}\text{F}$
 $\text{kV/mm} \times 25.4 = \text{V/mil}$
 $\text{mm} / 25.4 = \text{inches}$
 $\mu\text{m} / 25.4 = \text{mil}$
 $\text{N} \times 0.225 = \text{lb}$
 $\text{N/mm} \times 5.71 = \text{lb/in}$
 $\text{N/mm}^2 \times 145 = \text{psi}$
 $\text{MPa} \times 145 = \text{psi}$
 $\text{N}\cdot\text{m} \times 8.851 = \text{lb}\cdot\text{in}$
 $\text{N}\cdot\text{m} \times 0.738 = \text{lb}\cdot\text{ft}$
 $\text{N}\cdot\text{mm} \times 0.142 = \text{oz}\cdot\text{in}$
 $\text{mPa}\cdot\text{s} = \text{cP}$

Note

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Reference 0.0