Technical Data Sheet

LOCTITE® EA 9535

Known as LOCTITE® Hysol 9535
August 2014

PRODUCT DESCRIPTION

LOCTITE® EA 9535 provides the following product characteristics:

Technology	Epoxy
Appearance	White paste[LMS]
Fluorescence	Positive under UV light[LMS]
Viscosity	Low
Components	One component - requires no mixing
Cure	Heat cure
Cure Benefit	Production - high speed curing
Application	Assembly of disposable medical devices.
Key Substrates	Stainless Steel and Plastics

LOCTITE® EA 9535 is a single component heat curing epoxy adhesive, suitable for a wide range of industrial or medical applications that require fast cure. The product cures rapidly when exposed to temperatures as low as 80 °C. Its viscosity characteristics ensure it is self levelling and can be applied by roller. It bonds a wide range of metals and plastics and by its chemical and temperature resistance it can be used in high operating temperature environments. LOCTITE® EA 9535 was specially designed for stainless steel cannulae into hubs, syringes and lancets for needle assemblies.

ISO-10993

An ISO 10993 Test Protocol is an integral part of the Quality Program for LOCTITE® EA 9535. LOCTITE® EA 9535 has been qualified to Henkel's ISO 10993 Protocol as a means to assist in the selection of products for use in the medical device industry. Certificates of Compliance are available on Henkel's website or through the Henkel Quality Department.

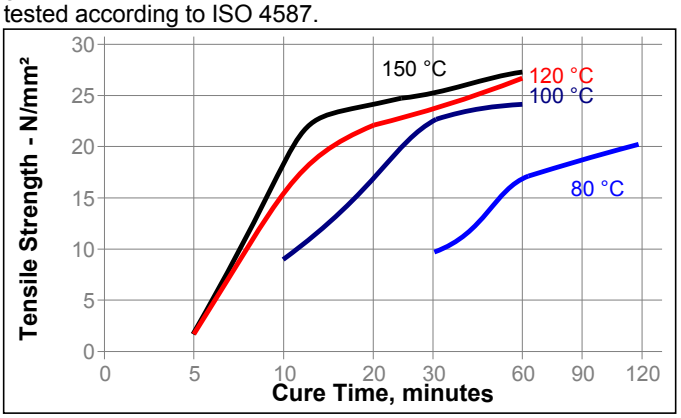
TYPICAL PROPERTIES OF UNCURED MATERIAL

Density, 25 °C, g/cm³	1.34 to 1.39[LMS]
Viscosity, Cone & Plate, mPa·s (cP):	
Temperature: 25 °C, Shear Rate: 200 s^{-1}	9,000 to 14,000[LMS]
Particle Size, µm	≤35[LMS]
Flash Point - See SDS	

TYPICAL CURING PERFORMANCE

Cure Speed vs. Time/Temperature

The rate of cure will depend on the ambient temperature. The graph below shows the shear strength developed with time on grit blasted steel lap shears at different temperatures and tested according to ISO 4587.



Isothermal DSC Conversion

Delta H, J/g	≤300[LMS]

TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 60 minutes @ 120 °C

Physical Properties :

Tensile Strength, ISO 37	N/mm² (psi)	40 (5,800)
Tensile Modulus , ISO 37	N/mm² (psi)	2,160 (310,000)
Elongation , ISO 37,%		2
Shore Hardness, ISO 868, Durometer D		87
Glass Transition Temperature, ISO 11359-2, °C		131
Coefficient of Thermal Expansion ISO 11359-2, K^{-1}:		
Below Tg		63×10^{-6}
Above Tg		165×10^{-6}
Coefficient of Thermal Conductivity, ISO 8302, W/(m-K)		0.3

Electrical Properties:

Dielectric Constant / Dissipation Factor, IEC 60250:	
1 kHz	3.45 / 0.012
1,000 kHz	3.2 / 0.017
10,000 kHz	3.2 / 0.015
Volume Resistivity, IEC 60093, Ω·cm	27×10^{15}
Surface Resistivity, IEC 60093, Ω	190×10^{15}

TYPICAL PERFORMANCE OF CURED MATERIAL

Cured for 60 minutes @ 120 °C

Lap Shear Strength , ISO 4587:

Mild Steel (grit blasted)	N/mm² (psi)	25 (3,600)
Galvanized Steel (Hot Dipped)	N/mm² (psi)	10 (1,500)
Brass	N/mm² (psi)	11 (1,600)
Aluminum	N/mm² (psi)	13 (1,900)
Aluminum (abraded)	N/mm² (psi)	18 (2,800)
Stainless Steel	N/mm² (psi)	13 (1,900)
Zinc dichromate	N/mm² (psi)	16 (2,300)
Copper	N/mm² (psi)	16 (2,300)
Glass Fiber Reinforced Epoxy	N/mm² (psi)	15 (2,200)
Glass-reinforced plastic (GRP)	N/mm² (psi)	2 (300)

Cured for 30 minutes @ 120 °C

Lap Shear Strength , ISO 4587 N/mm² :

Aluminum (abraded)	N/mm² (psi)	≥12[LMS] (≥1,740)

TYPICAL ENVIRONMENTAL RESISTANCE

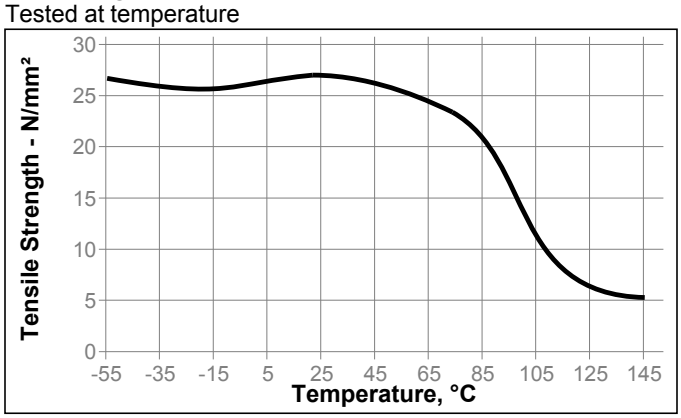
Cured for 60 minutes @ 120 °C

Lap Shear Strength , ISO 4587:

Mild Steel (grit blasted)

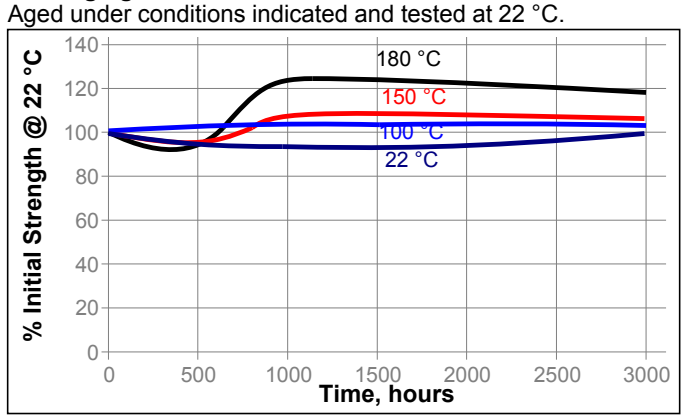
Hot Strength

Tested at temperature



Heat Aging

Aged under conditions indicated and tested at 22 °C.



Chemical/Solvent Resistance

Aged under conditions indicated and tested at 22 °C

		% of initial strength		
Environment	**°C**	**500 h**	**1000 h**	**3000 h**
Water	60	70	69	62
Water	90	37	33	26
Water/glycol 50/50	87	61	73	75
Motor oil	22	88	94	94
Acetone	22	94	96	91
Isopropanol	22	91	97	98
98% RH	40	89	46	65
Unleaded gasoline	22	103	101	101
Sodium Chloride, 7.5%	22	86	89	79
Acetic Acid, 10%	22	67	67	22

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. Remove product from refrigeration and allow to reach ambient temperature before use.
2. For best performance surfaces for bonding should be clean, dry and free of grease. For high strength structural bonds, special surface treatments can increase the bond strength and durability.
3. It is recommended that this product is not cured in large quantities as excessive heat build-up and uncontrolled exothermal runaway can occur. Curing smaller quantities will minimize the heat build-up.
4. Immediately assemble the parts.
5. Keep the assembled parts from moving during cure. The joint should be allowed to develop full strength before subjecting to any service loads.
6. Cure adhesive as recommended in section 'Typical Cure Performance'.
7. Excess uncured adhesive can be wiped away with organic solvent (e.g. Acetone).
8. After use and before adhesive hardens, mixing and application equipment should be cleaned with hot soapy water.

Loctite Material Specification[LMS]

LMS dated May 20, 2005. 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: 2 °C to 8 °C. Storage below 2 °C or greater than 8 °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/mm² x 145 = psi
MPa = N/mm²
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

Disclaimer

Note:
The information provided in this Technical Data Sheet (TDS) including the recommendations for use and application of the product are based on our knowledge and experience of the product as at the date of this TDS. The product can have a variety of different applications as well as differing application and working conditions in your environment that are beyond our control. Henkel is, therefore, not liable for the suitability of our product for the production processes and conditions in respect of which you use them, as well as the intended applications and results. We strongly recommend that you carry out your own prior trials to confirm such suitability of our product.
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