Technical Data Sheet

LOCTITE® EA 11C™

Known as LOCTITE® Hysol® 11C™
January 2015

PRODUCT DESCRIPTION

LOCTITE® EA 11C™ provides the following product characteristics:

Technology	Epoxy
Chemical Type	Epoxy
Appearance (Resin)	Black[LMS]
Appearance (Hardener)	green[LMS]
Appearance (Mixture)	Black[LMS]
Components	Two part - Resin & Hardener
Mix Ratio, by weight - Resin : Hardener	100 : 38
Mix Ratio, by volume - Resin : Hardener	2.5 : 1
Cure	Room temperature cure after mixing
Secondary Cure	Heat
Application	Bonding
Specific Benefit	• Machineable • Sandable • High service temperature • Low outgassing properties • Withstands severe environments • Room Temp or Heat Cure

LOCTITE® EA 11C™ is a general purpose adhesive and sealant that bonds, seals, and repairs a wide variety of materials including metals, most plastics, and wood.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Resin:

Specific Gravity @ 25 °C	1.6
Flash Point - See SDS	
Viscosity, Brookfield - RV, 25 °C, mPa·s (cP):	
Spindle 7, speed 10 rpm	140,000 to 330,000

Hardener:

Specific Gravity @ 25 °C	1.67
Flash Point - See SDS	
Viscosity, Brookfield - RV, 25 °C, mPa·s (cP):	
Spindle 7, speed 2 rpm	500,000 to 900,000

Mixed:

Pot life 100 grams, @ 25 °C, minutes	≥20[LMS]

TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 1 hour @ 90 °C

Outgassing Properties:

Total Mass Loss, %	0.47
Collected Volatile Condensable Material, %	0.02

Cured for 2 hours @ 60 °C

Physical Properties:

Shore Hardness, ISO 868, Durometer D	≥65[LMS]

Cured for 3 hours @ 120 °C

Physical Properties:

Glass Transition Temperature (Tg) by DSC, °C	114

Cured for 3 days@ 25 °C, tested @ 100 °C

Physical Properties:

Coefficient of Thermal Conductivity, ASTM E 1530, W/(m·K)	0.75

Cured for 3 days @ 25 °C

Physical Properties:

Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}:	
Pre Tg	38×10^{-6}
Post Tg	134×10^{-6}

Electrical Properties:

Dielectric Breakdown Strength, IEC 60243-1, kV/mm	18.5
Dielectric Constant / Dissipation Factor, IEC 60250:	
1 kHz	5.0 / 0.05
Volume Resistivity, IEC 60093, Ω·cm	5.0×10^{14}
Surface Resistivity, IEC 60093, , Ω	$\geq9.47\times10^{16}$

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 3 days @ 25 °C

Lap Shear Strength, ISO 4587:

Aluminum (etched):

Tested @ -55 °C	N/mm² (psi)	7.8 (1,130)
Tested @ 25 °C	N/mm² (psi)	16.5 (2,390)
Tested @ 82 °C	N/mm² (psi)	15.6 (2,270)
Tested @ 121 °C	N/mm² (psi)	10.5 (1,520)
Tested @ 149 °C	N/mm² (psi)	4.1 (600)

Cured for 2 hours @ 60 °C
Lap Shear Strength, ISO 4587:
Aluminum (etched):

Tested @ -55 °C	N/mm²	17.3
	(psi)	(2,510)
Tested @ 25 °C	N/mm²	12.4
	(psi)	(1,800)
Tested @ 82 °C	N/mm²	13.6
	(psi)	(1,970)
Tested @ 121 °C	N/mm²	10
	(psi)	(1,460)
Tested @ 149 °C	N/mm²	4.1
	(psi)	(600)

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 Safety Data Sheet (SDS).

Directions for use:

Mixing:

1. **When mixing by hand**, combine Part A (Resin) and Part B (Hardener) in the correct ratio and mix thoroughly until the color and consistency are uniform. EPOXI-PATCH® Tube Kits have been designed so that squeezing **EQUAL LENGTH BEADS of Part A & Part B** will give the proper ratio.
2. Mixing the adhesive just prior to use is recommended. The temperature of the separate components prior to mixing is not critical, but they should be close to room temperature.
3. Heat buildup during and after mixing is normal. To reduce the likelihood of exothermic reaction or excessive heat buildup, mix less than 900 grams at a time. Mixing smaller amounts will minimize heat buildup.

Applying

1. Bonding surfaces should be clean, dry, and free of contamination.
2. Once the adhesive is applied, the bonded parts should be held in contact until the part has developed handling strength (3 to 4 hours @ 25 °C) *note: this can vary with different bond configurations*. It is not necessary to clamp the parts unless movement during cure is likely.

Cure

1. Complete cure is obtained after 72 hours @ 25 °C. LOCTITE® EA 11C™ can also be fully cured with heat such as; 2 hours at a maximum temperature of 60 °C.
2. After 24 hours, approximately 90% of full cure properties are attained at room temperature.
3. This product can also be cured for 1 hour @ 82°C or 20 to 30 minutes @ 121°C.
4. Heat cures can be modified to achieve a desired degree of cure from handling strength to full cure.

Clean up

1. It is important to clean up excess adhesive from the work area and application equipment before it hardens.
2. Denatured alcohol and many common industrial solvents are suitable for removing uncured adhesive.

Loctite Material Specification[LMS]

LMS dated August 31, 2009 (Resin) and LMS dated August 30, 2009 (Hardener). 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

(°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

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. 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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Reference 0.1