Technical Data Sheet

LOCTITE® HY 4070™

July 2017

PRODUCT DESCRIPTION

LOCTITE® HY 4070™ provides the following product characteristics:

Technology	Cyanoacrylate / Acrylic Hybrid
Chemical Type (Part A)	Cyanoacrylate
Chemical Type (Part B)	Methacrylate
Appearance - Part A	Transparent, cloudy, colorless to pale yellow[LMS]
Appearance - Part B	Clear colorless to slightly yellow liquid[LMS]
Components	Two components - requires mixing
Viscosity	Non-sag
Mix Ratio by volume: Part A: Part B	10 : 1
Cure	Two component cure after mixing
Application	Bonding

LOCTITE® HY 4070™ is a two component, hybrid adhesive that provides a fast fixture at room temperature in bond gaps up to 5 mm (0.2 in). This product has excellent bonding characteristics to a variety of substrates including some plastics, rubbers, and metals. LOCTITE® HY 4070™ is designed for applications where complete cure of excess adhesive is required, as well as temperature and moisture resistance. The gel consistency prevents adhesive flow even on vertical surfaces.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A:

Specific Gravity @ 25 °C	1.05 to 1.1
Casson Viscosity @ 25 °C, mPa·s (cP):	
Cone & Plate Rheometer	200 to 1,300[LMS]

Part B:

Viscosity, Cone & Plate, mPa·s (cP):	
Temperature: 25 °C, Shear Rate: 1,000 s^{-1}	1 to 30[LMS]

TYPICAL CURING PERFORMANCE

Curing is initiated on mixing the Part A and Part B components. Handling strength is achieved rapidly; full strength is achieved over time.

Nozzle Life

Gel Time in Mixer Nozzle, minutes	4 to 5

Fixture Time

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

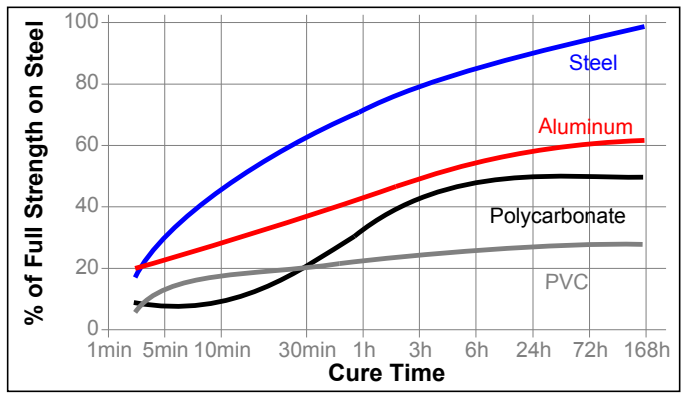
Fixture Time @ 25°C, :

Aluminium:

0.05 mm gap (seconds)	<60
2.0 mm gap (minutes)	4 to 6

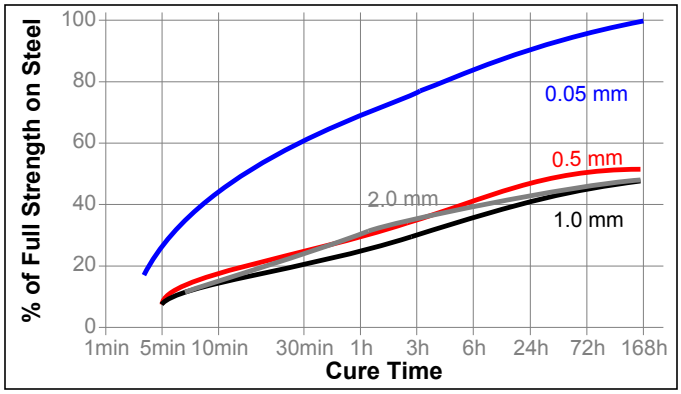
Cure Speed vs. Substrate

The rate of cure will depend on the substrate used. The graph below shows the shear strength developed with time on grit blasted mild steel lap shears compared to different materials and tested according to ISO 4587.

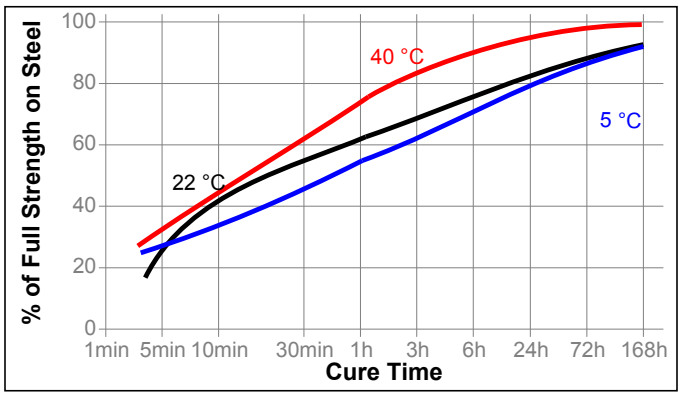


Cure Speed vs. Bond Gap

The rate of cure will depend on the bondline gap. The following graph shows the shear strength developed with time on grit blasted mild steel lap shears at different controlled gaps and tested according to ISO 4587.



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



TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 1 week @ 22 °C

Physical Properties:

Glass Transition Temperature ISO 11359-2, °C		110
Shore Hardness, ISO 868, Durometer D		65
Coefficient of Thermal Expansion, ISO 11359-2 K^{-1}:		
Below Tg (110°C)		129×10^{-6}
Linear Shrinkage, ASTM D 792 %		4.3
Tensile Strength, at break, ISO 527-3	N/mm² (psi)	14.6 (2,117)
Tensile Modulus, ISO 527-3	N/mm² (psi)	960 (139,200)
Elongation, at break, ISO 527-3, %		4.9

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

Cured for 1 week @ 22 °C

Impact Strength, ISO 9653, kJ/m² :

Steel (grit blasted)		4.2

"T" Peel Strength, ISO 11339:

Steel	N/mm	0.4
	(lb/in)	(2.9)
Aluminum	N/mm	0.5
	(lb/in)	(2.9)

Lap Shear Strength, ISO 4587:

Mild steel (grit blasted)	N/mm²	25
	(psi)	(3,625)
Aluminum	N/mm²	15
	(psi)	(2,175)
Aluminum (etched)	N/mm²	20
	(psi)	(2,900)
Polycarbonate	* N/mm²	12
	* (psi)	(1,740)
PVC	* N/mm²	7
	* (psi)	(1,015)
Zinc dichromate	N/mm²	22
	(psi)	(3,190)
Mild steel (abraded)	N/mm²	28
	(psi)	(3,190)
Aluminum (abraded)	N/mm²	20
	(psi)	(2,900)
ABS	* N/mm²	8
	* (psi)	(1,160)
Phenolic	N/mm²	8
	(psi)	(1,160)
Nitrile	* N/mm²	1
	* (psi)	(145)
Epoxy FR-10	N/mm²	20
	(psi)	(2,900)
Wood (Oak)	* N/mm²	11
	* (psi)	(1,595)

* substrate failure

TYPICAL ENVIRONMENTAL RESISTANCE

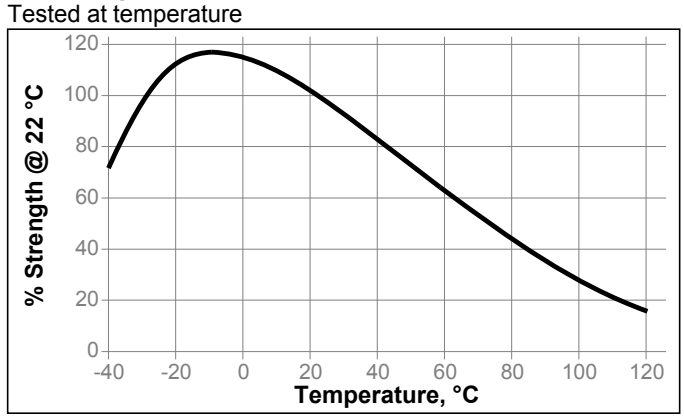
Cured for 1 week @ 22 °C

Lap Shear Strength, ISO 4587:

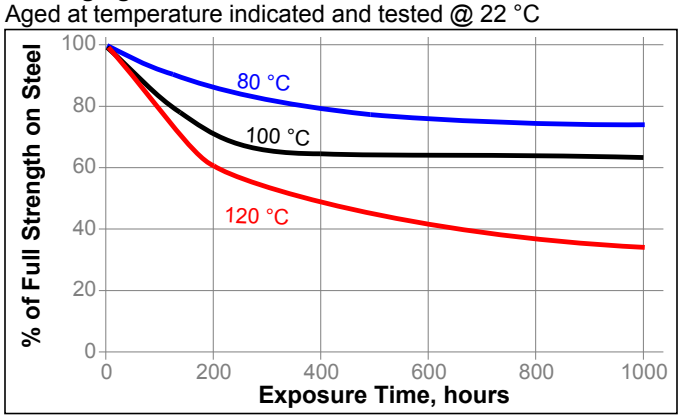
Steel (grit blasted)

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	22	111	113	107
Unleaded gasoline	22	93	83	58
Ethanol	22	96	92	73
Isopropanol	22	108	107	100
Water	22	92	83	81
Water	60	85	54	58
Water/glycol 50/50	87	33	0	0
Water/glycol 50/50	22	103	105	100
98% RH	40	104	86	84
95% RH	65	72	63	47

Lap Shear Strength, ISO 4587:
Aluminum

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
98% RH	40	42	18	24
95% RH	65	22	24	24

Lap Shear Strength, ISO 4587:
Polycarbonate

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
98% RH	40	98	101	102

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:

1. Bond areas should be clean and free from grease. Clean all surfaces with a Loctite® cleaning solvent and allow to dry.
2. To use, Part A and Part B must be blended. Product can be applied directly from the cartridge by using the plunger supplied and dispensing through the recommended mixing nozzle.
3. Hold the cartridge upright and insert the plunger.
4. While keeping the cartridge in an upright position, remove cap, attached the mixing nozzle, and begin dispensing the adhesive upward until any bubbles present in the smaller component have been removed.
5. Dispense and discard a bead as long and as wide as the mixing nozzle, to ensure sufficient mixing.
6. Apply the mixed adhesive to one of the bond surfaces to be joined. Parts should be assembled immediately after the mixed adhesive has been applied.
7. Bonds should be held fixed or clamped until adhesive has fixtured.
8. Keep assembled parts from moving during cure. The bond should be allowed to develop full strength before subjecting to any service load (typically 24 hours).

Loctite Material Specification[LMS]
LMS dated April 20, 2016 (Part A) and LMS dated April 20, 2016 (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: 2°C to 21°C. Storage below 2°C or greater than 21°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.

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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

Reference 0.1