Technical Data Sheet

LOCTITE® HY 4080™

July 2017

PRODUCT DESCRIPTION

LOCTITE® HY 4080™ provides the following product characteristics:

Technology	Cyanoacrylate / Acrylic Hybrid
Chemical Type (Part A)	Cyanoacrylate
Chemical Type (Part B)	Methacrylate
Appearance - Part A	Clear to slightly hazy[LMS]
Components	Two components - requires mixing
Appearance - Part B	White to off-white paste[LMS]
Appearance (Mixed)	Opaque to slightly yellow
Mix Ratio by volume: Part A: Part B	1 : 1
Viscosity	High, thixotropic
Application	Bonding wide range of materials
Cure	Two component cure after mixing
Specific Benefits	• Substrate versatlity • Medium fixture time • Excellent impact resistance

LOCTITE® HY 4080™ is a two component structural Hybrid adhesive that provides toughness and excellent adhesion to metals, composites, and plastics. This product provides fast fixture at room temperature and high operational strength within the first hour. This product has good resistance to peel and impact loads while maintaining its high shear strength over a wide range of temperatures and in larger gaps.

TYPICAL PROPERTIES OF UNCURED MATERIAL

Part A Properties:

Specific Gravity, g/cm³	1.06 to 1.11
Viscosity @ 25°C, mPa·s (cP)	
Cone & Plate Rheometer:	
Shear rate 100 s^{-1}	4,000 to 11,000[LMS]

Flash Point - See SDS

Part B Properties:

Specific Gravity, g/cm³	1.09 to 1.13
Viscosity @ 25°C, mPa·s (cP)	
Cone & Plate Rheometer:	
Shear rate 20 s^{-1}	45,000 to 75,000[LMS]

Flash Point - See SDS

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.

Open Time

On part life @ 25°C minutes	10

Fixture Time

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

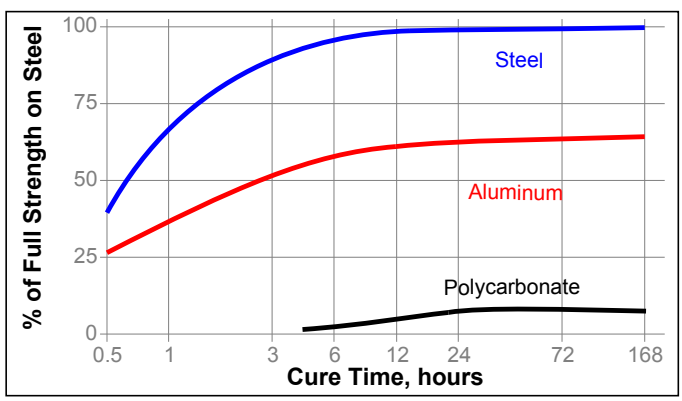
Fixture Time, minutes:	
Grit Blasted Mild Steel, 0.05 mm gap	10
Aluminum, 0.05 mm gap	10
Aluminum, 2 mm gap	12

Peak Exotherm Temperature

Peak Exotherm Temperature, 20 gram mass:	
Peak Temperature Time, seconds	313
Peak Temperature, °C	158

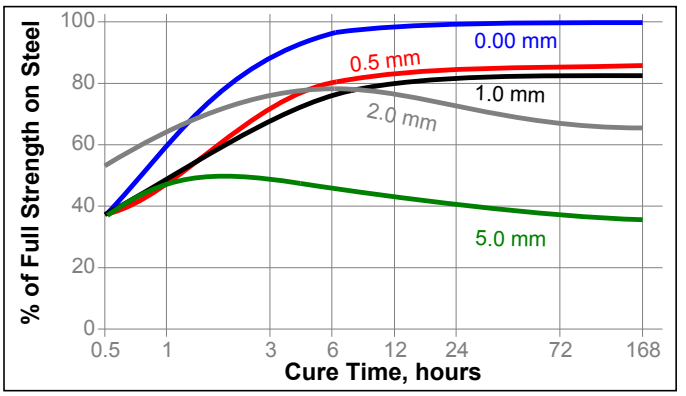
Cure Speed vs. Substrate

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



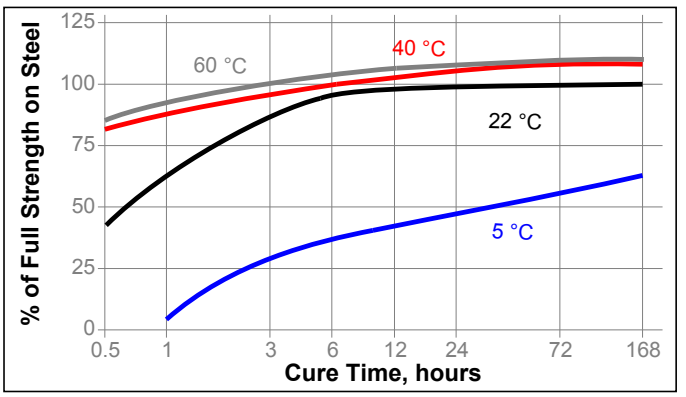
Cure Speed vs. Bond Gap

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.



Cured for 1 week @ 22°C

Impact Strength, ISO 9653, kJ/m² : 4.1

"T" Peel Strength, ISO 11339:

Steel (grit blasted)	N/mm	7.0
	(lb/in)	(40)
Aluminum (grit blasted)	N/mm	5.0
	(lb/in)	(29)

Shear Strength:

Lap Shear Strength :

Mild steel (grit blasted)	N/mm²	25.6
	(psi)	(3,670)
Mild Steel (abraded)	N/mm²	24.6
	(psi)	(3,570)
Aluminum (abraded)	N/mm²	15.7
	(psi)	(2,290)
Aluminum (etched)	N/mm²	20.4
	(psi)	(2,960)
Zinc dichromate	N/mm²	17.2
	(psi)	(2,120)
ABS	N/mm²	3.8
	(psi)	(550)
Phenolic	N/mm²	5.7
	(psi)	(830)
Polycarbonate	N/mm²	2.4
	(psi)	(350)
Nitrile	N/mm²	0.4
	(psi)	(60)
Wood (Oak)	* N/mm²	7.3
	* (psi)	(1,060)
Epoxy	N/mm²	10.0
	(psi)	(1,450)
PVC	* N/mm²	11.5
	* (psi)	(1,670)
PMMA	* N/mm²	6.7
	* (psi)	(970)

* substrate failure

TYPICAL PROPERTIES OF CURED MATERIAL

Cured for 1 week @ 22°C

Physical Properties:

Glass Transition Temperature, ISO 11359-2, °C		48 to 76
Coefficient of Thermal Expansion, ISO 11359-2 K^{-1}:		
Below Tg (46 to 76°C)		143×10^{-06}
Above Tg (46 to 76°C)		202×10^{-06}
Linear Shrinkage, in/in ASTM D 792		4.7
Shore Hardness, ISO 868, Durometer D		72
Tensile Strength, at break, ISO 527-3	N/mm²	11.3
	(psi)	(1,639)
Tensile Modulus, ISO 527-3	N/mm²	355
	(psi)	(51,475)
Elongation, at break, ISO 527-3, %		80

TYPICAL PERFORMANCE OF CURED MATERIAL

Adhesive Properties

TYPICAL ENVIRONMENTAL RESISTANCE

Cured for 1 week @ 22°C

Lap Shear Strength :

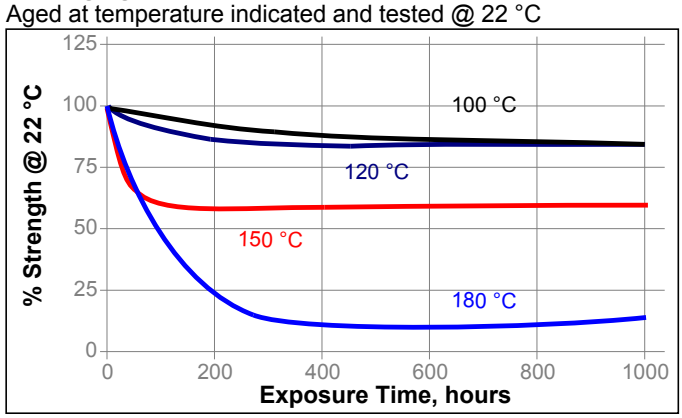
Mild Steel (grit blasted)

Hot Strength

Tested at temperature

Heat Aging

Aged at temperature indicated and tested @ 22 °C



Chemical/Solvent Resistance
Aged under conditions indicated and tested @ °C

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
Motor oil	22	100	100	110
Unleaded gasoline	22	85	75	60
Ethanol	22	85	80	65
Isopropanol	22	90	85	85
Water	22	85	70	65
Water	60	45	35	30
Water/glycol	22	90	85	85
98% RH	40	70	50	50
95% RH	65	50	30	25

Lap Shear Strength, ISO 4598:
Aluminum

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
95% RH	65	40	30	15

Lap Shear Strength, ISO 4598:
Polycarbonate

		% of initial strength		
Environment	**°C**	**100 h**	**300 h**	**500 h**
98% RH	40	95	60	40

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).

Where aqueous washing systems are used to clean the surfaces before bonding, it is important to check for compatibility of the washing solution with the adhesive. In some cases these aqueous washes can affect the cure and performance of the adhesive.

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 dual cartridge by dispensing through the mixer head supplied.
3. **50g Dual Cartridge:** Stand dual cartridge upright for 1 minute. Keeping the cartridge in an upright position, insert it into the application gun, remove cap and expel a small amount of adhesive to be sure both sides are flowing evenly and freely. Attach the mixing nozzle.
4. **400g Dual Cartridge:** Stand dual cartridge upright for 1 minute. Remove the cartridge cap and locking ring, attach the mixing nozzle and secure with the locking ring. Load cartridge into the application gun so that the yellow label on cartridge is visible above the nozzle. Holding the application gun at a 45° angle, with the nozzle tip pointing upwards, begin dispensing the adhesive until the product reaches the nozzle tip.
   NOTE: A pneumatic application gun is required to apply the product from the 400g dual cartridge at a maximum dispense pressure of 2 bar (30 psi).
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).

Color
Color variation is possible between the batches and will not affect the performance of the product.

Loctite Material Specification[LMS]
LMS dated May 25, 2016 (Part A) and LMS dated May 17, 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 for 50mL and 400mL cartridges, 2°C to 8°C for large 22kg pails. 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 Henkel 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

Disclaimer

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Reference 0.2