4090 Two Component High Temperature Gel

Product Description

LOCTITE® 4090™ provides the following product characteristics:

Technology	Cyanoacrylate/epoxy hybrid
Chemical type (part A)	Cyanoacrylate
Chemical type (part B)	Epoxy
Appearance (comp. A)	Transparent colourless to straw coloured liquid[LMS]
Appearance (comp. B)	Off-white to light yellow gel[LMS]
Appearance (mixture)	Off-white to light yellow gel
Components	Two components, requires mixing
Mix ratio by volume, part A : part B	1 : 1
Viscosity	High
Cure	Room temperature cure after mixing
Application	Bonding

LOCTITE® 4090™ is a two component, general purpose adhesive which provides a very fast fixture at room temperature. It is designed to bond a variety of substrates including metals, most plastics and rubbers. LOCTITE® 4090™ provides good temperature and moisture resistance which also makes it suitable for applications in high temperature/humidity environments. The thixotropic nature makes it suitable for applications where good gap filling properties on rough and poorly fitting surfaces are required.

Typical Properties of Uncured Material

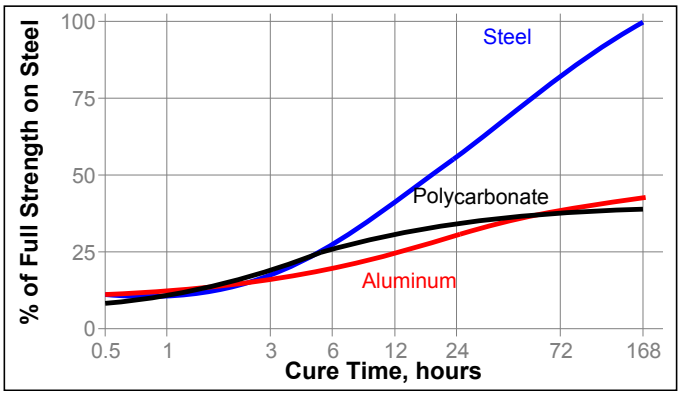
Part A	
Specific Gravity, g/cm³	1.01
Viscosity, Cone & Plate, mPa·s (cP):	
Temperature: 25°C	4,000 to 7,000[LMS]
Flash point – see SDS	
Part B	
Specific Gravity, g/cm³	1.06
Viscosity, Cone & Plate, mPa·s (cP):	
Temperature: 25°C	25,000 to 40,000[LMS]
Flash point – see SDS	

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.

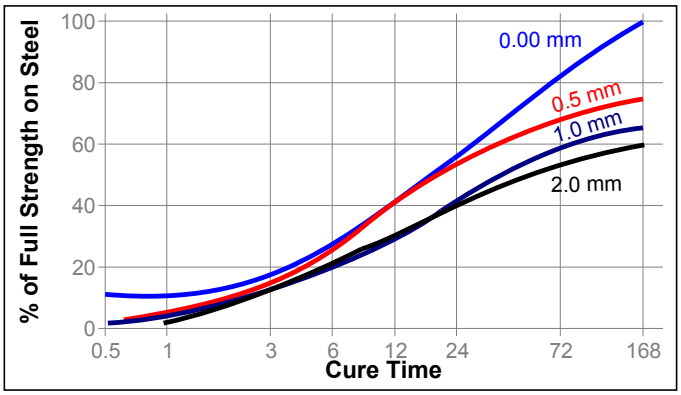
Cure Speed vs. Substrate

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.



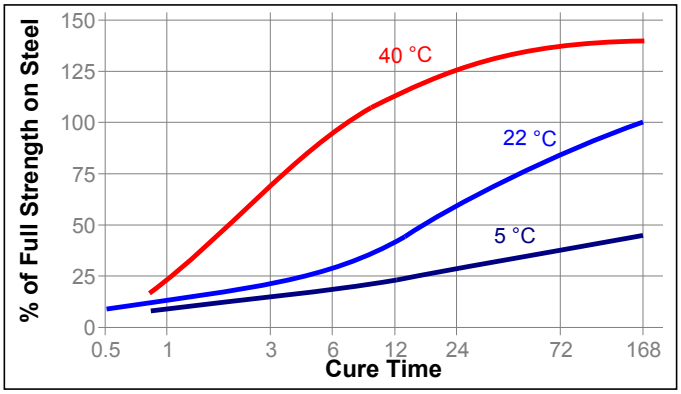
Cure Speed vs. Bond Gap

The rate of cure will depend on the bond line 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 Performance of Cured Material

Physical Properties

Cured for 1 week @ 22°C		
Glass transition temperature ISO 11359-2, °C	88	
Shore hardness, ISO 868, Durometer D	65 to 69	
Coefficient of Thermal Expansion, ISO 11359-2, K^{-1}		
Below Tg (88°C)	71×10^{-06}	
Above Tg (88°C)	175×10^{-06}	
	N/mm²	psi
Tensile strength, at break, ISO 527-3	7.1	1,025
Tensile modulus, ISO 527-3	565	81,800
Elongation, at break, ISO 527-3, %	3.6	

Adhesive Properties

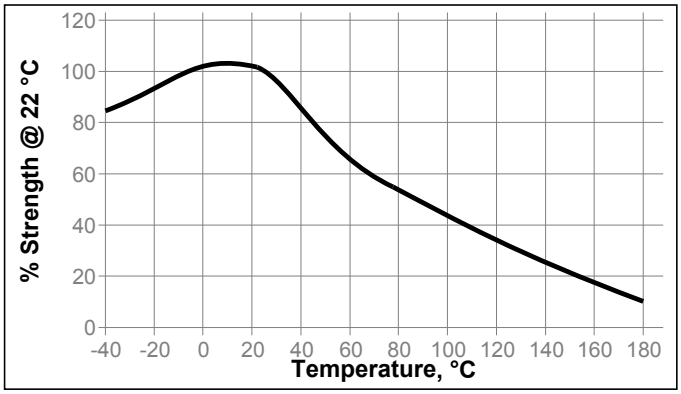
Cured for 168 hours @ 22°C		
Shear Strength, Lap Shear Strength, ISO 4587:	**N/mm²**	**psi**
Steel (grit blasted)	17	2,420
Aluminium	7.6	1,100
Aluminium (etched)	13	1,900
Zinc dichromate	9.1	1,320
Stainless steel	15	2,120
ABS	5.2	750
Phenolic	3.2	460
Polycarbonate	6.9	1,000
Nitrile	0.7	100
Wood (oak)	4.8	700
Epoxy	9.1	1,320
Polyethylene	0.5	72
Polypropylene	0.6	87

Typical Environmental Resistance

Cured for 1 week @ 22°C
Lap Shear Strength, ISO 4587:
Steel (grit blasted)

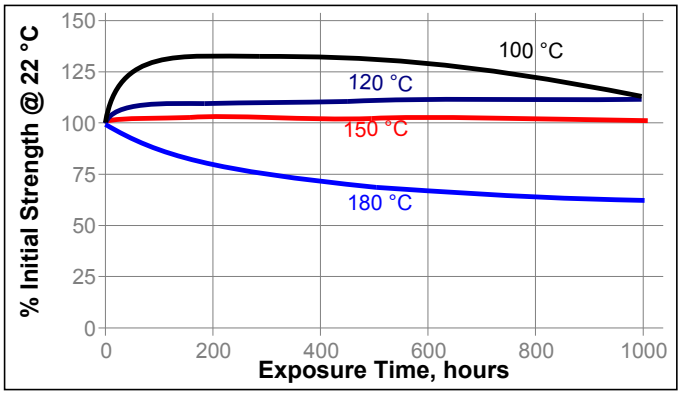
Hot Strength

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**
Water	22	90	75	70
Water	60	80	55	55
Motor oil	40	120	130	130
Unleaded gasoline	22	95	100	105
Ethanol	22	85	90	90
Isopropanol	22	100	100	95
Water/glycol 50/50	87	50	5	5
98% RH	40	85	70	70
95% RH	65	95	85	65

Lap Shear Strength, ISO 4587: Polycarbonate

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
98% RH	40	100	90	80

Lap Shear Strength, ISO 4587: Aluminium

		% of initial strength		
Environment	**°C**	**100 h**	**500 h**	**1000 h**
98% RH	65	100	95	85

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 Position dual cartridge upright for one minute. In this upright position, insert the cartridge into the application gun and start the plunger into the cylinders using light pressure on the trigger .

4 Remove the cartridge cap and expel a small amount of adhesive to be sure both sides are flowing evenly and freely. Attach the static mixing nozzle to the end of the cartridge and begin dispensing the adhesive.

5 Purge and dispose of the first 3-8cm from the end of the mix nozzle, as it may not be sufficiently mixed.

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.

Loctite Material Specification[LMS]

LMS dated May 27, 2013 (Part A) and LMS dated June 10, 2013 (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 labelling.

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

µm / 25.4 = mil

N x 0.225 = lb

N/mm x 5.71 = lb/in

N/mm^2 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