



# Threadlocking

## User's Guide

What you need to know to ensure  
a reliable threaded assembly



Henkel



[www.useloctite.com](http://www.useloctite.com)

## Loctite® – Finding a Better Way

### Old Way

#### Mechanical Locking Devices

Mechanical locking devices (e.g., split washers, nylon nuts) were invented to solve the common problem of loosening that occurs in most threaded assemblies. Although they were made for this purpose, they have several shortcomings.

#### Shortcomings of Mechanical Locking Devices

- Loosen under vibration, thermal expansion and/or improper torque
- Do not seal threads
- Require extensive inventory of several shapes and sizes
- Prone to rust



### Better Way

#### Loctite® Threadlockers

Invented 50 years ago by Loctite Corporation, now Henkel Corporation, this revolutionary method to lock and seal threaded fasteners with liquid anaerobic adhesives has found worldwide acceptance. Suited for a wide range of applications, from delicate electronic components to heavy industrial equipment, Loctite® threadlockers have dramatically increased the reliability of threaded assemblies.

#### Benefits of Loctite® Threadlockers

- Lock nuts and bolts against vibration and thermal expansion
- Seal against corrosion and leakage
- Reduce inventory costs
- Suitable for all shapes and sizes of fasteners
- Act as a thread lubricant
- Maintain critical adjustments of the assembly
- No on-torque adjustments needed
- High chemical resistance



# Loctite® Threadlocking Guide

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### HOW TO SELECT THE RIGHT LOCTITE® THREADLOCKER

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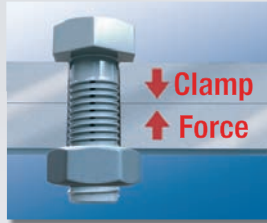
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# Threaded Fasteners

## Functions of a threaded assembly

1. Create clamp force
2. Maintain clamp force
3. Allow disassembly



## Why do threaded assemblies fail?

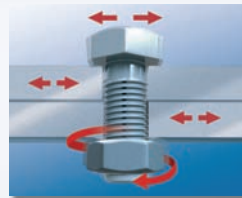
### Clamp force is not maintained

Threaded assemblies loosen because of:

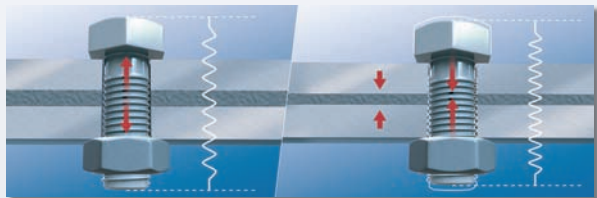
- A. Gaps:** In order to make the assembly possible, nuts and bolts must have some tolerance, which creates gaps between the threads.
- B. Vibration & side-to-side movement:** These gaps allow the parts to move from side-to-side when exposed to vibration.
- C. Expansion/contraction & loosening:** Expansion and contraction can also cause side-to-side movement. This, in addition to vibration, leads to loosening and ultimately disassembly of parts.



Parts tolerance



Vibration and loosening

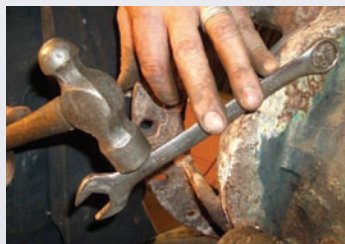


Stretching of the bolt beyond its yield point and thermal expansion/contraction of parts lead to lack of structural rigidity and relaxation of parts.

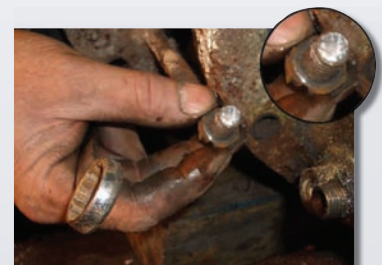
### Disassembly is not always possible

This failure happens because, in certain conditions, a nut and a bolt can seize together. This seizing effect is caused by:

- **Corrosion**, rust, when dealing with:
  - ✓ Humidity
  - ✓ High temperatures
  - ✓ Assembly of different metals (galvanic corrosion)
- **Galling** (friction welding)



Corroded assemblies can be difficult to take apart...



...which can lead to broken bolts.



# Locking Methods

## Shortcomings of locking devices



### Split ring or spring washers

Increased friction reduces clamp load; will not ensure reliable threadlocking under dynamic loads.



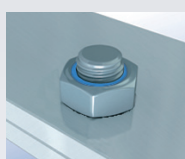
### Tab washers, split pins, castle nuts

Expensive and time-consuming methods, they often impose challenges to line up their components appropriately (i.e., tabs, cotter pins).



### Tooth or ribbed flanged bolts

Prevent self-loosening, but are expensive; need larger flange-bearing surfaces and may damage the surfaces.



### Nylon nut

More expensive than a standard nut, nylon inserts increase friction, which results in inaccurate torque.

## Why use Loctite® threadlockers?

### Loctite® Benefits

#### Better Performance

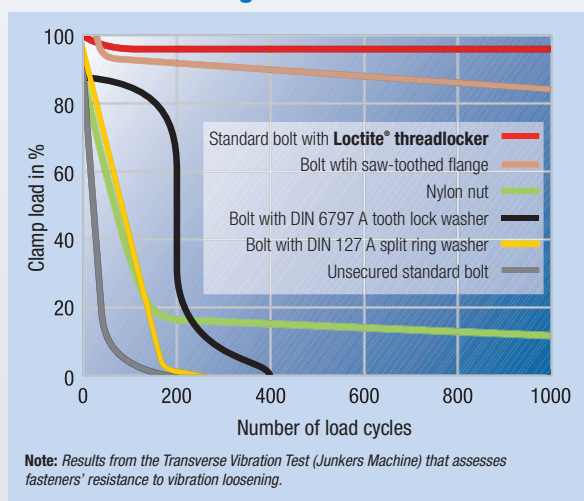
- **Reliable assembly:** Lock against vibration, shock and thermal cycling – plus seal against corrosion and galling.
- **Easy disassembly** using hand tools when low- or medium-grade formula is selected.
- **Outperform locking devices:** Better clamp load retention compared to all mechanical locking devices.

#### Cost Savings

- **Failure:** Reliable threaded assemblies reduce costly downtimes.
- **Inventory:** “One size fits all,” universally applicable for a wide range of fastener sizes.
- **Processing:** Ease of automation reduces assembly costs and increases throughput.
- **Material Cost:** Lower cost per unit compared to most locking devices.



### Vibration loosening test



### Cost per locking application

Fastener Size	Split Ring Washer	Loctite® Threadlocker
3/8"	2¢	2¢
5/8"	9¢	5¢
7/8"	25¢	7¢

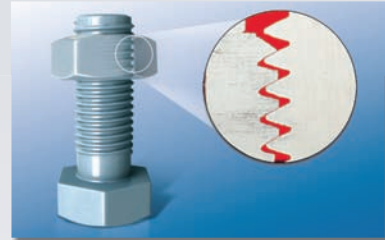
**Note:** Washer pricing based on 100 units purchased at an industrial distributor. Loctite® pricing based on 50 ml bottle price and number of drops required per application.

# Loctite® Threadlocking Solutions

## How does a Loctite® threadlocker work?

### Fill Gaps

Loctite® threadlockers are single-component adhesives that cure in the absence of air and in contact with active metal to form a tough thermoset plastic. They completely fill all voids between the interfacing threads, which makes the assembly a unitized component and ultimately prevents loosening.



*Loctite® threadlocker between the interfacing threads*

### Seal Threads

Another property of Loctite® threadlockers is thread sealing. This property is especially important when assembling through-bolts in an oil reservoir or cooling jacket in order to keep the fluids sealed in and corrosion out. Examples of this application are common, but not limited, to gearboxes and internal combustion engines.



*Engagement area of rusty bolt that did NOT have Loctite® threadlocker applied*



*Engagement area of rusty bolt that DID have Loctite® threadlocker applied*

## How do I use a Loctite® threadlocker?

### Application Options



*For through-holes*



*For blind holes*



*For post-assembly*



*For overhead applications*



*For pre-applied applications*

**IMPORTANT:** To achieve optimum performance, all parts must be clean and free of contaminants (e.g., oil, grease).

### Dispensing Options



*250 ml and 50 ml Loctite® push-pull nozzle*



*250 ml and 50 ml Loctite® hand pumps*



*Loctite® integrated semiautomatic dispenser, dispense valve and stationary dispense valve*

For maximum convenience and productivity, Loctite® threadlockers can be dispensed through Loctite® dispensing systems. For more information, visit [www.equipment.loctite.com](http://www.equipment.loctite.com).



## When should I use a Loctite® primer?

### Speed up cure

Significantly speed up the cure time of Loctite® threadlockers when assembling metal parts that are cold, have large gaps or deep threads. Not required for primerless products.



Loctite® QuickStix™ 7088™ Primer

### Inactive metal assemblies\*

When assembling metal parts with inactive surfaces, Loctite® primers are recommended to ensure proper performance of Loctite® threadlockers. Not required for primerless products.

*Inactive Metals (Primers Recommended)			Active Metals (Primers Optional)	
Plated Parts	Zinc	Magnetite Steel	Iron	Manganese
Anodized Aluminum	Pure Aluminum	Inconel®	Plain Steel	Monel®
Titanium	Cadmium	Silver	Copper	Kovar®
Stainless Steel	Magnesium	Gold	Brass	
Galvanized Steel	Natural or Chemical Black Oxide		Bronze	

*Loctite® threadlockers cure in the absence of air and presence of metal ions. When assembling inactive metal parts, which are low in metal ions, the use of Loctite® primers is recommended to ensure proper performance of Loctite® threadlockers.*

## Loctite® threadlocker key selection factors

### Strength

- **Low Strength:** Ideal for fasteners < ¼" (6 mm). Easy disassembly using hand tools.
- **Medium Strength:** Designed to be removable with standard hand tools on ¼" to ¾" fasteners.
- **High Strength:** Designed to deliver high strength on ¼" to ¾" (6 mm to 22 mm) fasteners. For removal, it may require localized heat (>550°F/260°C), hand tools, and disassembly while hot.



*Easy disassembly with hand tools when using Low and Medium Strength formulas*

### Viscosity

- **Liquid Formulas:** Everyday assembly; ideal for fine threads and blind holes
- **Semisolid Formulas:** Pocket-friendly, ideal for overhead applications
- **Tape Formula:** Pocket-friendly; controlled application; can be pre-applied several days before assembly.



Liquid



Gel

### Application Methods

- **Pre-Applied:** QuickTape™ threadlocker can be applied beforehand on bolts that are waiting to be assembled.
- **Pre-Assembly:** Most Loctite® liquid threadlockers are designed to be applied at the moment that parts will be assembled.
- **Post-Assembly:** Wicking grade formula can be applied on parts that are already assembled.



QuickTape™: Pre-applied application

### Materials Being Assembled

- **All Loctite® Threadlockers:** Metal-to-metal applications.
- **Loctite® 425™ Assure™:** Plastic-to-plastic, plastic-to-metal applications.

# Loctite® Threadlocker Selection

Are the parts being assembled metal or plastic?

Plastic Assembly

Metal Assembly

Wicking Grade

Low Strength

What strength do you require?

What strength do you require?

High Lubricity – Black

Liquid Product

Medium Strength – Blue

Medium / High Strength – Green

Medium Strength – Blue Paste

High Strength – Red Paste

High Strength – Liquid

Solution

Loctite® 425™  
Assure™

Loctite® 220™  
Threadlocker

Loctite® 290™  
Threadlocker

Loctite® 2422™  
Threadlocker

Loctite® 2620™  
Threadlocker

Loctite® 2047™  
Threadlocker

Fastener  
Size

Small fasteners

up to ¼"

#2 to ½"

½" to ¾"

½" to ¾"

> ¾"

Cure  
Time<sup>a</sup>

1.5 min. / 24 hrs.

6 min. / 24 hrs.

20 min. / 24 hrs.

90 min. / 24 hrs.

30 min. / 24 hrs.

90 min. / 24 hrs.

Torque<sup>b</sup>  
(break/prevail)

4 / 2

85 / 170

90 / 260

102 / 12

161 / 10

204<sup>b1</sup> / 35

Temp.<sup>c</sup>

180°F (80°C)

300°F (150°C)

300°F (150°C)

650°F (340°C)

650°F (340°C)

300°F (150°C)



Product  
Details

## Loctite® 425™ Assure™ Instant Adhesive

Low strength, fast surface-curing threadlocker for plastic fasteners. Can be used as a tamper-proofing agent for the head of screws. Can be applied before or after assembly.

## Loctite® 220™ Threadlocker – Medium Strength / Wicking / Blue

A low viscosity threadlocking adhesive that allows the product to wick along the threads of preassembled fasteners. Perfect for fasteners up to ¼" diameter (6 mm).

## Loctite® 290™ Threadlocker – High Strength / Wicking / Green

Recommended for locking pre-assembled fasteners, i.e., instrumentation screws, electrical connectors and set screws. Also seals porosities in welds and metal parts.

## Loctite® 2422™ Threadlocker – High Temp / High Strength

Recommended for locking fasteners that are exposed to temperatures up to 650°F (340°C). Removable with hand tools.

## Loctite® 2620™ Threadlocker – High Temp / High Strength

Recommended for locking fasteners that are exposed to temperatures up to 650°F (340°C). Recommended for locking fasteners permanently.

## Loctite® 2047™ Threadlocker – High Lubricity / High Strength

Recommended for fasteners over ¾" (22 mm). Formulated with increased lubricity to reduce friction and allow proper clamp load to be achieved. Ideal for locking fasteners permanently.

<sup>a</sup> CURE TIME (fixture time in min./full strength in hrs). Typical value @ 70°F (21°C) <sup>b</sup> TORQUE values in in.-lbs. (breakaway/prevailing torque) <sup>b1</sup> BREAKLOOSE VALUE <sup>c</sup> TEMPERATURE resistance for continuous service

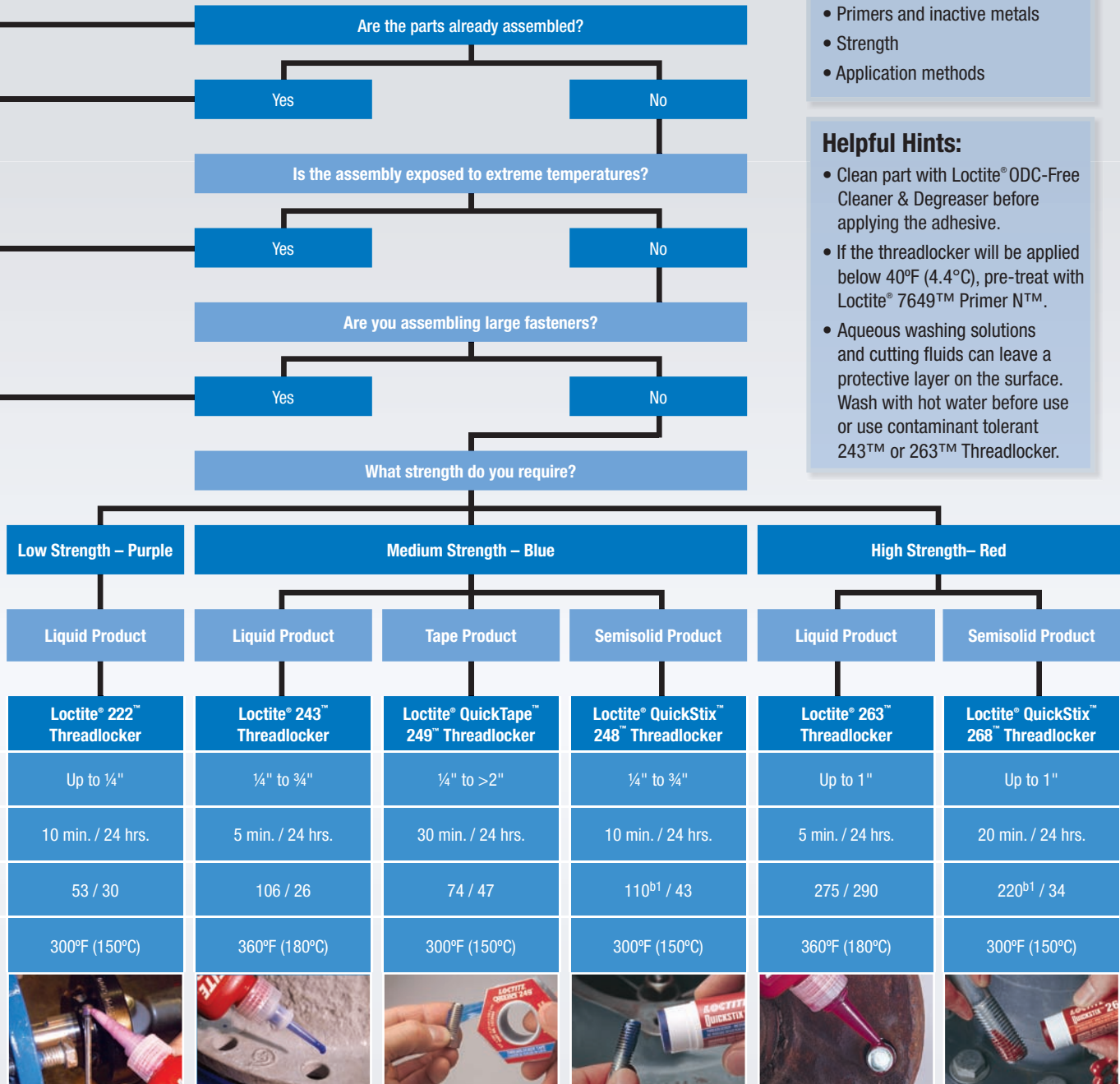


**IMPORTANT!** See page 5 for more information on:

- Primers and inactive metals
- Strength
- Application methods

### Helpful Hints:

- Clean part with Loctite® ODC-Free Cleaner & Degreaser before applying the adhesive.
- If the threadlocker will be applied below 40°F (4.4°C), pre-treat with Loctite® 7649™ Primer N™.
- Aqueous washing solutions and cutting fluids can leave a protective layer on the surface. Wash with hot water before use or use contaminant tolerant 243™ or 263™ Threadlocker.



#### Loctite® 222™ Threadlocker – Low Strength

Recommended for low strength threadlocking of adjustment screws, countersunk head screws and set screws; on collars, pulleys, tool holders and controllers. Also for low strength metals such as aluminum or brass. Also available in Loctite® 222MS™ version which carries Mil-Spec (S-46163A) Type II, Grade M. NSF P1.

#### Loctite® 243™ Threadlocker – Medium Strength/Primerless

Versatile, medium strength liquid threadlocker. Reliably locks and seals metal fasteners up to ¾" (19 mm). Engineered to cure consistently on a variety of metals, despite minor surface contaminants. Works on steel, stainless steel and most plated fasteners. Tolerates thread lubrication, anti-corrosion and protection fluids. Rated for 360°F (180°C).

#### Loctite® QuickTape™ 249™ Threadlocking Tape

The one and only threadlocker in a tape form. This revolutionary medium strength threadlocking adhesive is removable with hand tools, and offers the same reliability as traditional Loctite® removable grade threadlocking liquids. Convenient, durable package is a must for every toolbox. Loctite® QuickTape™ 249™ is easy to apply and can be preapplied for future assembly.

#### Loctite® QuickStix™ 248™ Threadlocker – Medium Strength

Semisolid stick form is convenient, portable, and great for hard-to-reach applications. Loctite® QuickStix™ 248™ Threadlocker is the ideal general purpose threadlocker for all nut and bolt applications, especially fasteners between ¼" and ¾" (6 mm to 19 mm). Removable with hand tools.

#### Loctite® 263™ Threadlocker – High Strength/Primerless

Versatile, high strength liquid threadlocker. Reliably locks and seals metal fasteners up to 1" (25 mm). Engineered to cure consistently on a variety of metals, despite minor surface contaminants. Works on steel, stainless steel and most plated fasteners. Tolerates thread lubrication, anti-corrosion and protection fluids. Rated for 360°F (180°C). Heat required for removal.

#### Loctite® QuickStix™ 268™ Threadlocker – High Strength

This convenient semisolid stick form is portable and less messy. Its high strength prevents loosening of threaded fasteners. Well-suited for heavy-duty applications.

# Loctite® Innovations



## Tape and Semisolid Products – Versatility and Cleanliness

### Loctite® QuickTape™ 249™ Threadlocking Tape

The first threadlocker in a convenient, tape form. Easy to use with no mess and no waste, Loctite® QuickTape™ 249™ provides the same reliable performance as traditional Loctite® medium-strength threadlocking liquids and sticks. It can even be pre-applied for future assemblies. It's a MUST HAVE for every toolbox!

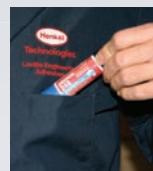


### Loctite® QuickStix™ 248™ Medium Strength

### Loctite® QuickStix™ 268™ High Strength

### Loctite® QuickStix™ 7088™ Primer

No mess, easy to apply and pocket-friendly. Ideal for overhead and pre-dispensed applications.



## Primerless Products – Speed and Performance

### Loctite® 243™ Medium Strength and Loctite® 263™ High Strength Threadlockers

The Loctite® 243™ Medium Strength and 263™ High Strength Threadlockers offer all of the performance properties of the original Loctite® 242® and 262™ products, plus more, to meet the ever-changing, ever-demanding industrial environments of today and tomorrow. The new formulas offer:

- High temperature performance able to withstand temperatures up to 360°F (182°C)
- Improved cure performance on oil-contaminated surfaces
- Cure without primer, even on inactive surfaces such as stainless steel



## High Temperature Products – Performance and Convenience

### Loctite® 2422™ Threadlocker, High Temp, Medium Strength

### Loctite® 2620™ Threadlocker, High Temp, High Strength

New paste formula does not run or migrate, and withstands continuous exposure to temperatures up to 650°F (340°C). These products are conveniently packaged in syringes for easy dispensing. Disassembling Loctite® 2620™ Threadlocker, High Temp, High Strength requires heating to above 650°F (340°C) and disassembling while hot.










## Large Fastener Product – High Lubricity and High Strength

### Loctite® 2047™ Threadlocker, High Lubricity and High Strength


Designed for applications on fasteners over 7/8" in diameter, this threadlocker and its formula with increased lubricity allow proper clamp load to be achieved by reducing friction. In addition, its high strength property will ensure that clamp load is maintained when exposed to vibration. Standard threadlockers may not have sufficient lubricity on large fasteners to achieve ultimate clamp load.



# Loctite® Threadlocker Properties Chart

KEY FACTORS	KEY FEATURES	PRODUCT	ITEM NUMBER	PACKAGE TYPE & SIZE	COLOR	TYPICAL USE	VISCOSITY (cP)†	TORQUE‡ in.-lbs. (break/prevail)	TEMP. RANGE	CURE SPEED (STEEL @ 25°C)	AGENCY APPROVALS
LOW STRENGTH	Small Fasteners	222™ 	21463 21464	10 ml bottle 50 ml bottle	Purple	Small screws under 1/4"	1,200 / 5,000 Thixotropic	53 / 30	-65°F to 300°F	Fixture – 10 min. Full – 24 hrs.	N/A
	General Purpose/ Primerless	243™ 	1330255 1329837 1329467 1329505 1330333	0.5 ml capsule 10 ml bottle 50 ml bottle 250 ml bottle 1 liter bottle	Blue	Primerless, medium strength	1,300 / 3,000	106 / 26	-65°F to 360°F	Fixture – 5 min. Full – 24 hrs.	N/A
REMOVABLE STRENGTH	General Purpose Tape	QuickTape™ 249™	1372603	260" Roll	Blue	Removable strength, 1/4" to > 2", pre-applied	Tape	74/47	-65°F to 300°F	Fixture – 30 min. Full – 24 hrs.	N/A
	General Purpose Semisolid Stick	QuickStix™ 248™	37684 37087	9 g stick 19 g stick	Blue	1/4" to 3/4" bolts, overhead, pre-dispensed, hard-to-reach areas	Semisolid	110* / 43	-65°F to 300°F	Fixture – 10 min. (3 min. w/primer) Full – 24 hrs.	CFIA
	High Temperature	246™	29513 29514 29515	10 ml bottle 50 ml bottle 250 ml bottle	Blue	High temperature, medium strength	2,600	170* / 48	-65°F to 450°F	Fixture – 20 min. Full – 24 hrs.	N/A
	Ultra-High Temperature	2422™	1134601 1134602	30 g syringe 300 g cartridge	Blue	Ultra-high temperature, medium strength for 1/2" to 3/4" bolts	Paste	102 / 12	-65°F to 650°F	Fixture – 90 min. Full – 24 hrs.	N/A
	General Purpose / Primerless	263™ 	1330582 1330583 1330585 1330335 1330334	0.5 ml capsule 10 ml bottle 50 ml bottle 250 ml bottle 1 liter bottle	Red	Primerless, high strength	400 / 600	275 / 290	-65°F to 360°F	Fixture – 10 min. Full – 24 hrs.	N/A
HIGH STRENGTH	General Purpose Semisolid Stick	QuickStix™ 268™	37685 37686	9 g stick 19 g stick	Red	Up to 3/4" bolts, overhead, pre-dispensed, hard-to-reach areas	Semisolid	220* / 34	-65°F to 300°F	Fixture – 20 min. (5 min. w/primer) Full – 24 hrs.	CFIA
	High Temperature	272™	27240 27270 27285	50 ml bottle 250 ml bottle 1 liter bottle	Red	High temperature applications	9,500	200 / 220	-65°F to 450°F	Fixture – 30 min. Full – 24 hrs.	CFIA
	Ultra-High Temperature	2620™ 	1138282	30 g syringe	Red	Ultra-high temperature, high strength for 1/2" to 3/4" bolts	Paste	161 / 10	-65°F to 650°F	Fixture – 30 min. Full – 24 hrs.	N/A
	Large Bolts	277™	21434 27731 27741 27743	10 ml bottle 50 ml bottle 250 ml bottle 1 liter bottle	Red	Large bolts > 7/8"	7,000	275 / 275	-65°F to 300°F	Fixture – 60 min. Full – 24 hrs.	MIL-S-46163A for existing designs, ASTM D-5363**
	High Lubricity Large Bolts	2047™ 	1134607	50 ml bottle	Black	Large bolts > 7/8". High lubricity allows proper clamp load to be achieved	2,000 / 12,000 Thixotropic	204* / 35	300°F	Fixture – 90 min. Full – 24 hrs.	N/A
	Removable Strength	220™	37388 39186 22041	10 ml bottle 50 ml bottle 250 ml bottle	Blue	Wicking grade for small, pre-assembled fasteners under 1/4"	20	85 / 170	-65°F to 300°F	Fixture – 6 min. Full – 24 hrs.	MIL-S-46163A for existing designs, ASTM D-5363**, CFIA
WICKING	General Purpose	290™ 	29005 29021 29031 29041 29043	0.5 ml capsule 10 ml bottle 50 ml bottle 250 ml bottle 1 liter bottle	Green	Medium/high strength. Wicking grade for pre-assembled parts	12	90 / 260	-65°F to 300°F	Fixture – 20 min. Full – 24 hrs.	MIL-S-46163A for existing designs, ASTM D-5363**, NSF/ANSI 61, NSF P1, CFIA
	High Temperature/Oil Tolerant	294™ 	27934 27935 27936 27937	0.5 ml capsule 10 ml bottle 50 ml bottle 250 ml bottle	Green	Medium/high strength, high temperature, wicking grade	34	289 / 237	-65°F to 450°F	Fixture – 6 min. Full – 24 hrs.	N/A
	Plastic Fasteners	425™ Assure™	42540 42561	20 g bottle 1 lb. bottle	Blue	For small metal and plastic fasteners and tamper-proofing	80	4 / 2	-65°F to 180°F	Fixture – 1.5 min. Full – 24 hrs.	N/A
FOOD GRADE	Processing equipment that can contact food	2046™	1186840	12 ml syringe	Blue	Strengthening / coupling agent for joints on equipment	Gel	111 / 63	450°F	Gel Time – 20 min.	FDA 21 C.F.R. 175.300
MIL-SPEC	Small Fasteners	222MS™	22205 22221 22231 22241	0.5 ml capsule 10 ml bottle 50 ml bottle 250 ml bottle	Purple	Small screws under 1/4"	1,200/5,000 Thixotropic	53 / 30	-65°F to 300°F	Fixture – 10 min. Full – 24 hrs.	MIL-S-46163A for existing designs, ASTM D-5363**, NSF P1, CFIA
	Removable Strength	242®	24205 24221 24231 24241	0.5 ml capsule 10 ml bottle 50 ml bottle 250 ml bottle	Blue	1/4" to 3/4" bolts	1,200/5,000 Thixotropic	110 / 43	-65°F to 300°F	Fixture – 10 min. Full – 24 hrs.	MIL-S-46163A for existing designs, ASTM D-5363**, NSF P1, ABS, CFIA
	High Strength	262™	26205 26221 26231 26241	0.5 ml capsule 10 ml bottle 50 ml bottle 250 ml bottle	Red	Up to 3/4" bolts	1,800/5,000 Thixotropic	189 / 275	-65°F to 300°F	Fixture – 5 min. Full – 24 hrs.	MIL-S-46163A for existing designs, ASTM D-5363**, NSF P1, ABS, CFIA
	Low Viscosity	271™	27105 27121 27131 27141	0.5 ml capsule 10 ml bottle 50 ml bottle 250 ml bottle	Red	High strength for fasteners up to 1" diameter	500	250 / 275	-65°F to 300°F	Fixture – 10 min. Full – 24 hrs.	MIL-S-46163A for existing designs, ASTM D-5363**, UL Classified for U.S., CFIA

\*Breakloose Value †See TDS for spindle and speed test measurement \*\*For new designs  Top choice product

‡M10 and/or 3/8 x 16 steel fasteners  Worldwide availability

## Loctite® Primers Properties Chart

	PRODUCT	ITEM NO.	PACKAGE TYPE & SIZE	PHYSICAL PROPERTY	ON-PART LIFE	DRY TIME	AGENCY APPROVALS
SOLVENT-BASED	7471™ Primer T™	19267 22477 19268	1.75 fl. oz. bottle 4.5 oz. net wt. aerosol can 1 gallon can	Liquid	7 days	30 to 70 seconds	MIL-S-22473E for existing designs, ASTM D-5363 for new designs
	7649™ Primer N™	19269 38402 21347 21348 19266	1.75 fl. oz. glass bottle 1.75 fl. oz. aluminum bottle 25 g net wt. aerosol can 4.5 oz. net wt. aerosol can 1 gallon can	Liquid	30 days	30 to 70 seconds	MIL-S-22473E for existing designs, ASTM D-5363 for new designs, NSF/ANSI 61, NSF P1, CFIA
SOLVENT-LESS	7090™	19368 12695	1 fl. oz. bottle 1 liter bottle	Liquid	1 hour	<10 minutes	–
	Loctite® QuickStix™ 7088™ Primer®	1069258	17 g stick	Semisolid	30 days	–	–

# Loctite® Solutions



*For your local Loctite® Adhesives and Sealants Specialist, the nearest authorized Loctite® products distributor, to place an order, to arrange an in-plant seminar or for technical product assistance, call 1.800.LOCTITE (562.8483) in the U.S.A, or call 1.800.263.5043 within Canada.*

When you choose the Loctite® brand, you receive much more than a reliable assembly; you obtain a comprehensive solutions package:

- Wide product range
- Advanced training programs
- Engineering services
- Research and development
- Agency certification and approvals
- Local application assistance
- Global availability



## U.S.A.

**Henkel Corporation**  
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Tel: 1.800.263.5043 (*within Canada*)  
Tel: 905.814.6511  
Fax: 905.814.5391



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