

How-to Application Guide

THREADLOCKERS



RETAINING COMPOUNDS



LOCTITE

Starting nearly 50 years ago with a unique liquid resin that hardens in the absence of air, anaerobic technology was invented by Loctite. This revolutionary method was developed to positively lock and seal threaded fasteners. Today, the use of anaerobic technology continues to hold together complex machines that are used to build everything from automobiles to dishwashers and tractors, to the trucks that deliver them. Loctite® products have helped make these machines and inner assemblies less expensive, more reliable, and longer lasting.



In response to industry needs, Loctite pioneered Threadlocker Adhesives with precisely controlled strength, resistance to extreme environments, and even varying viscosities to meet virtually any application need.



Loctite later applied the innovative anaerobic technology to create a new class of adhesives, Retaining Compounds. Loctite® Retaining Compounds secure and increase the shear strength of non-threaded cylindrical assemblies. Retaining Compounds fill the “inner space” between components and cure to form a strong, precision assembly. This has been widely accepted as a standard method for assembling press and slip-fitted parts. Retaining Compounds are formulated in a variety of strengths, viscosities, cure times, and flexibility characteristics to keep pace with emerging assembly materials and manufacturing techniques.

All Loctite® Threadlocker Adhesives and Retaining Compounds can be applied with manual, semi-automatic or automatic dispensing systems.



THREADLOCKING

Intro & Key Benefits to Threadlocking	1
Choosing the Right Threadlocker	2
Answers to Frequently Asked Questions	3
Threadlocker Application Tips	4-6



RETAINING

Intro & Key Benefits to Retaining Compounds	7
Choosing the Right Retaining Compound	8
Answers to Frequently Asked Questions	9
Retaining Application Tips	10-16



SURFACE PREPARATION

Why and How to Use Loctite® Primers/Cleaners	17
Technical/Ordering Information	18-20

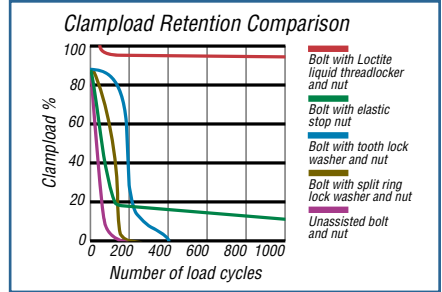
THREADLOCKING



LOCTITE® Threadlockers drive reliability up and costs down.

Since the design of threaded fasteners, manufacturers have been searching for the solution to vibrational loosening. Vibrational loosening of fasteners creates warranty problems, reliability issues, and unscheduled shutdown of equipment. Over the years, several different locking devices for fasteners have been developed to try to solve this problem, each with varying degrees of success and cost.

VIBRATION RESISTANCE



Loctite® Threadlockers work harder and smarter because they do what traditional locking devices can't; they completely fill thread paths to eliminate the movement that causes parts to shake and vibrate loose.



Threaded assembly without Loctite® Threadlocker



Threaded assembly treated with Loctite® Threadlocker

KEY BENEFITS

Loctite® Threadlockers, when used on standard fasteners, can eliminate expensive locking devices and provide increased reliability and quality to your assemblies. One drop prevents loosening and ensures a secure hold. Compare for yourself. Loctite® Threadlockers can drive reliability up and costs down. Some of the biggest benefits of Loctite® Threadlockers, other than reliability and low cost per application, are that you can pick the strength you need, stop corrosion, seal threads, improve torque control, reduce galling, and minimize inventories. Loctite® Threadlockers provide lubricity to achieve controlled torque during assembly, and in operation, they hold critical clamp load pressures under the most severe environments.

COMPARATIVE LOCKING COSTS						
Type of mechanical locking device	Added cost per thousand over plated 3/8" x 16" x 1" Grade 5 Nut & Bolt			Locks	Seals	Lubricates
SPS flex lock nut	\$ 250.00			Yes	NO	NO
Pre-applied Nylok® patch	\$ 125.00			NO	NO	NO
Bolt with serrated flange	\$ 90.00			NO	NO	NO
DIN 127 A spring washer	\$ 48.27			NO	NO	NO
DIN 6797 A (M10) tooth lock washer	\$ 26.47			NO	NO	NO
Nylon insert lock nut	\$ 21.00			NO	NO	NO
Polymide washer	\$ 11.00			NO	NO	NO
Loctite® Threadlocker	\$ 2.10			YES	YES	YES

Note: Estimated costs based on average annual purchase of 100,000 pcs.



THREADLOCKING

Choosing the Right **LOCTITE®** Threadlocker for the Application

Choosing the right Loctite® Threadlocker for the application is simple. Just answer these questions.

1. Do you need a threadlocker that can be removed or one that is permanent?

Loctite® Threadlockers are available in removable or permanent formulations.

2. What size thread are you locking?

Loctite® Threadlockers are available in a variety of strengths to lock any size fastener.

3. Is the application a blind hole or a thru-hole?

The application method for blind hole assemblies differs from standard thru-hole assemblies. See page 4.

4. Are there threadlockers for pre-assembled bolts?

Loctite offers wicking grade threadlockers that secure set screws and other assemblies after settings are completed. See page 6.

5. What kind of metal(s) will be used?

On **two** inactive metals such as stainless steel, zinc, magnesium, black oxide, cadmium, anodized aluminum, passivated, titanium, and others, a primer is needed to cure Loctite® Threadlockers. If only one inactive metal, no primer is needed.

6. What other environmental conditions exist?

Loctite has formulated its line of threadlockers to meet any application need – high temperature, severe vibration, and chemical resistance.

7. Will your application have to meet any agency approval?

Loctite® offers the broadest line of products approved by some of the most demanding regulatory agencies – NSF*, UL*, Military.

LOW STRENGTH THREADLOCKERS



- Removable with hand tools
- Adjustment screws
- Calibration screws
- Meters and gauges
- Up to 1/4" diameters

MEDIUM STRENGTH THREADLOCKERS



- Removable with hand tools
- Machine tools and presses
- Pumps and compressors
- Mounting bolts
- Gear boxes
- Up to 3/4" diameters

* NSF = National Sanitation Foundation. UL = Underwriter's Laboratories.



Answers to the most frequently asked questions (FAQ) about using **LOCTITE®** Threadlockers

Q. How do I disassemble parts? What is the procedure?

A. Use standard hand tools for disassembly of low and medium strength threadlockers. For high strength threadlockers, apply localized heat to nut or stud for 5 minutes at 450°F. Disassemble while hot.

Q. When should I use a primer with threadlockers and when is it not necessary?

A. Always use a primer when **two** inactive metals are involved, or when you need to speed up the curing process for faster return to service. See page 17.

Q. Can I use threadlockers on plastic threads?

A. This is not recommended as softening and/or stress cracking can occur.

Q. I have excess squeeze-out of threadlocker product. Why hasn't it cured?

A. The anaerobic chemistry will cure only between metal surfaces when deprived of air.

Q. I used a permanent threadlocker on a blind hole application and the fastener still backed out with vibration. Why?

A. The application method for blind hole assemblies requires that product be applied to both parts. If product is only applied to the fastener, air pressure will force the liquid threadlocker to escape as you torque it down. Lack of uniform coverage creates air pockets, causing incomplete cures which result in failures.

HIGH STRENGTH THREADLOCKERS



- Permanent assembly
- Heavy equipment
- Suspension bolts
- Motor and pump mounts
- Bearing cap bolts and studs
- Up to 1" and larger diameters

PENETRATING THREADLOCKERS



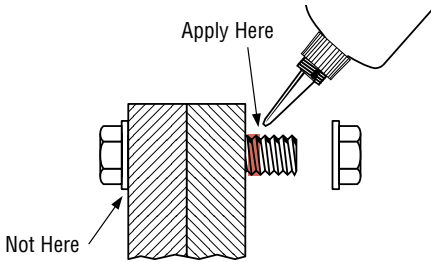
- Removable with heat and hand tools.
- Preassembled fasteners
- Instrumentation screws
- Electrical connectors
- Carburetors
- Up to 1/2" diameters



THREADLOCKING

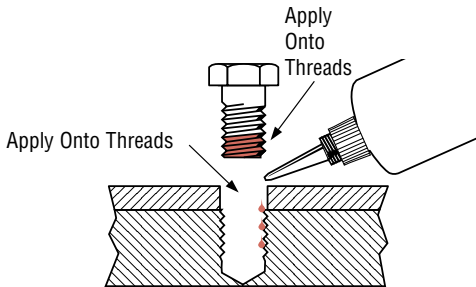
LOCTITE® Threadlocker Application Tips

THRU HOLE (BOLTS AND NUTS)



1. Clean all threads (bolt and nut) with Loctite® ODC-Free Cleaner & Degreaser.
2. If necessary, spray all threads with Loctite® 7649 (Primer N) or Loctite® 7471 (Primer T). Allow to dry.
3. Select the proper strength (low, medium, high) Loctite® Threadlocker product.
4. Insert bolt into thru hole assembly.
5. Apply several drops of Threadlocker onto bolt at targeted tightened nut engagement area.
6. Assemble and tighten nut as usual.

BLIND HOLES (CAP SCREWS, ETC.)



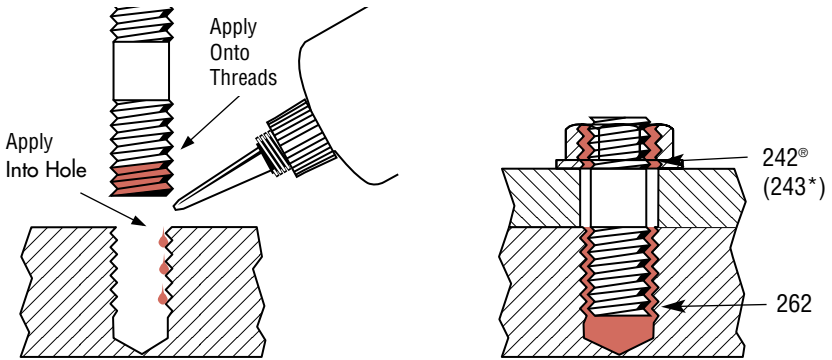
1. Clean all threads (bolt and hole) with Loctite® ODC-Free Cleaner & Degreaser.
2. If necessary, spray (bolt and hole) with Loctite® 7649 (Primer N) or Loctite® 7471 (Primer T). Allow 30 seconds to dry.
3. Select the proper strength (low, medium, high) Loctite® Threadlocker.
4. Squirt several drops down the sides of the female threads.
5. Apply several drops to bolt.
6. Tighten as usual.

Note: Using Loctite® Threadlockers will virtually eliminate stripped threads in aluminum or magnesium housings caused by galvanic corrosion.



LOCTITE® Threadlocker Application Tips

BLIND HOLES (STUDS, ETC.)



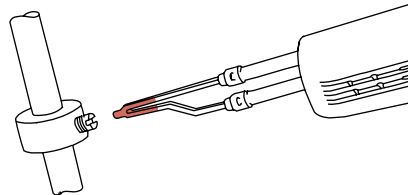
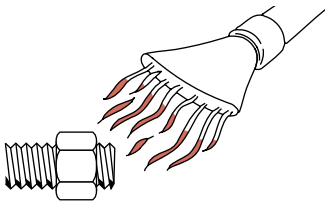
1. Clean all threads (bolt and hole) with Loctite® ODC-Free Cleaner & Degreaser.
2. If necessary, spray all threads with Loctite® 7649 (Primer N) or Loctite® 7471 (Primer T). Allow to dry.
3. Squirt several drops of high strength Loctite® Threadlocker down the sides of the female threads.

Note: Use Loctite® 277* Threadlocker if stud is over 1" diameter.

4. Apply several drops of high strength Loctite® Threadlocker onto stud threads.
5. Install studs.
6. Position cover, head, etc.
7. Apply drops of medium strength Loctite® Threadlocker onto exposed threads.
8. Tighten nuts as required.

* Worldwide or Application-Specific Alternative

HIGH STRENGTH DISASSEMBLY



LOCALIZED HEATING METHODS

1. Apply localized heat to nut or stud (450°F - 600°F for 5 minutes).
2. Disassemble while HOT.

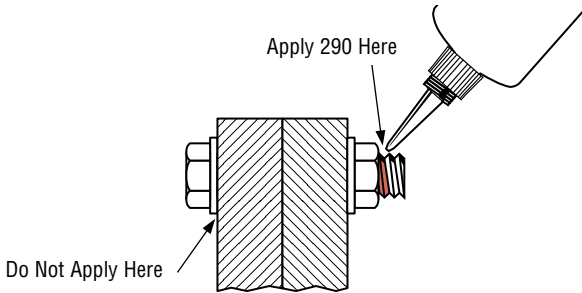
Note: Use standard hand tools for disassembly at room temperature of low and medium strength Loctite® Threadlockers.



THREADLOCKING

LOCTITE® Threadlocker Application Tips

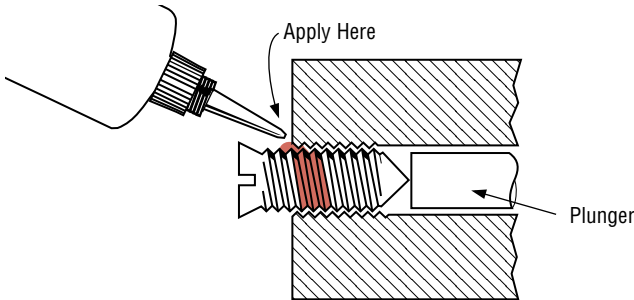
PRE-ASSEMBLED FASTENERS



1. Clean bolts and nuts with Loctite® ODC-Free Cleaner & Degreaser.
2. Assemble components.
3. Tighten nuts.
4. Apply drops of penetrating Loctite® 290 Threadlocker at the nut and bolt juncture.
5. Avoid touching bottle tip to metal.

Note: For preventive maintenance on existing equipment: Retighten nuts and apply a penetrating Loctite® 290 Threadlocker at the nut and bolt juncture.

ADJUSTMENT SCREWS



1. Adjust screw to proper setting.
2. Apply drops of penetrating Loctite® 290 Threadlocker at screw and body juncture.
3. Avoid touching bottle tip to metal.

Notes:

- If re-adjustment is difficult, apply heat to screw with soldering gun (450°F).
- Loctite® 220 is a lower strength version of Loctite® 290 Threadlocker.

LOCTITE offers the best method to satisfy your retaining needs.

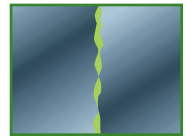
Retaining is a generic term used to refer to any method of holding together non-threaded cylindrically-fitted components. Traditional methods include keyways, splines, set screws, shrink fits, and interference fits. Each of these purely mechanical methods has inherent problems and limitations.

In 1963, the first "retaining compound" was introduced. Through the years, technical advancements were made and both manufacturing and maintenance engineers alike discovered and adopted anaerobic retaining technology in place of mechanical methods.

Bonded slip fits are always more economical to produce than splines, keyways or interference fits. Within the limits of good machinery practice, there are no additional requirements to the surface finish. In fact, the rougher the surface, the better the adhesive will be able to key into it, thus the higher the strength of the assembly. This is a great advantage over tight surface tolerances involved with interference fits. The same holds true for size tolerances. Bonded slip fits are not sensitive to clearance differences, and as a result, the dimensional tolerances can be greatly relaxed, resulting in lower production costs. Assembly can simply be done by hand, avoiding the need for press or heating equipment.



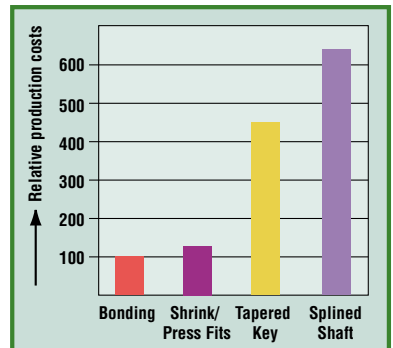
Typical press fit has 30% metal-to-metal contact.



Loctite® Retaining Compounds fill air voids, resulting in unitized, more reliable assembly.

KEY BENEFITS

- Augments or replaces press fits
- Reduces machining costs
- Eliminates distortion during installation
- Eliminates backlash in keys and splines
- Simpler, lower cost designs are possible
- Produces more accurate, rigid assemblies
- Increases strength of heavy press fits
- Eliminates fretting corrosion and seizure
- Provides a seal when essential
- Eliminates stress in parts
- Disassembles with heat.



Cost is always an essential part of the selection process. When Loctite® Retaining Compounds are used, considerable cost benefits result.

RETAINING

Choosing the right **LOCTITE®** Retaining Compound for the Application

Choosing the right Loctite® Retaining Compound is simple. Just answer these questions.

1. What type of metal(s) are the parts made of?

On **two** inactive metals such as stainless steel, zinc, magnesium, black oxide, cadmium, anodized aluminum, passivated, titanium, and others, a primer is needed to cure Loctite® Retaining Compounds. If only one inactive metal, no primer is needed.

2. How much clearance is there between the parts?

Loctite® Retaining Compounds are formulated to meet diametral gap fills up to .020".

3. What other environmental conditions exist?

Loctite has formulated its line of Retaining Compounds to meet any application need – high temperature, high strength, close fitting parts, loose fitting parts, and chemical resistance.

4. Will your application have to meet any agency approval?

Loctite offers the broadest line of products approved by some of the most demanding regulatory agencies – NSF*, UL*, Military.

GENERAL PURPOSE RETAINING COMPOUNDS



- Ideal for close fitting parts
- Locks bushings and sleeves in housings and on shafts
- Locks bearings in place
- Augments press fits
- Fills diametral gaps to 0.005"

HIGH TEMPERATURE RETAINING COMPOUNDS



- Resists temperatures to 450°F
- Retains valve seats
- Retains cylindrical liners
- Designed for gap filling slip fits

* NSF = National Sanitation Foundation. UL = Underwriter's Laboratories.

Answers to the most frequently asked questions (FAQ) about using **LOCTITE®** Retaining Compounds

- Q. I am designing the application around your product. What is the optimum fit for using your product?**
- A.** Generally, a slip fit is recommended with a diametral clearance of .001" - .004".
- Q. What's the correct procedure for applying Loctite® Retaining Compounds?**
- A.** For slip fit assemblies, apply to only one of the parts – not both. Assemble with a twisting/turning motion (do not push). For tight/close-fitting assemblies with minimal clearance, apply to both parts.
- Q. I need to retain a worn shaft and also lock it into a housing or bearing. Any solutions?**
- A.** Loctite® 660 Quick Metal® Repair.
- Q. I need to lock bearings in place but there will be exposure to oils. Will the Loctite® Retaining Compound also seal the joint?**
- A.** Yes, all Loctite® Retaining Compounds provide a dual benefit – lock and seal.

FAST CURE RETAINING COMPOUNDS



- Fixtures in 5 minutes
- Locks bushings and sleeves in housings and on shafts
- Locks bearings in place
- Designed for use on close fitting parts

HIGH STRENGTH RETAINING COMPOUNDS

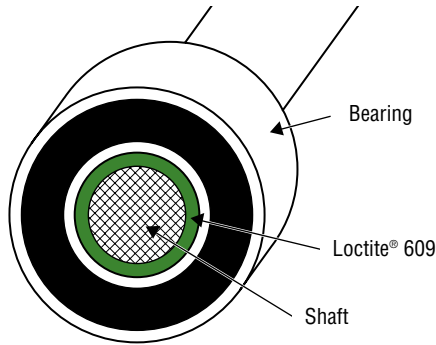


- Up to 4,000 psi shear strength on steel
- Joins fitted cylindrical parts
- Gears, wheels, pulleys, cams, collars, fly wheels, sprockets, and rotors to shafts

RETAINING

Shaft Mounted Components

SLIP FIT - GENERAL PURPOSE



ORIGINAL

1. Machine shaft to .002"-.004" diametral slip fit with 50-80 rms finish (second cut).
2. Clean all parts with Loctite® ODC-Free Cleaner & Degreaser.
3. If both surfaces are inactive, apply Loctite® 7649 (Primer N) or Loctite® 7471 (Primer T) to one surface.
4. Apply Loctite® 609 General Purpose Retaining Compound around shaft at engagement area.
5. Assemble parts with twisting action.
6. Wipe off excess.
7. Allow parts to fixture prior to service.

WORN SHAFT

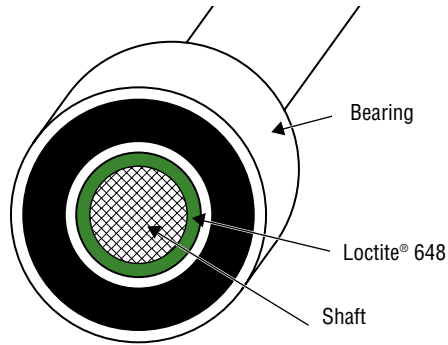
Using Loctite® Quick Metal® 660, follow directions above except:

1. Determine diametral gap.
2. If diametral gap exceeds .010", Loctite® 7649 (Primer N) must be used.
3. Take steps to maintain concentricity with large gaps.
4. Larger gaps require longer cure times (30-60 minutes).
5. Loctite® Quick Metal® 660 is NOT recommended for diametral gaps exceeding .010".

Note: Loctite® Quick Metal® 660 fixtures in 30 seconds or less with Loctite® 7649 (Primer N).

Shaft Mounted Components

SLIP FIT - FAST CURE



ORIGINAL

1. Machine shaft to .002"-.004" diametral slip fit with 50-80 rms finish (second cut).
2. Clean all parts with Loctite® ODC-Free Cleaner & Degreaser.
3. Do NOT use Loctite® 7649 (Primer N).
4. Apply Loctite® 648 Fast Cure Retaining Compound around shaft and engagement area.
5. Assemble parts with rotating motion.
6. Wipe off excess.
7. Allow parts to fixture prior to service.

WORN SHAFT

Using Loctite® Quick Metal® 660, follow directions above except:

1. Determine diametral gap.
2. If diametral gap exceeds .010", Loctite® 7649 (Primer N) must be used.
3. Take steps to maintain concentricity with large gaps.
4. Larger gaps require longer cure times.

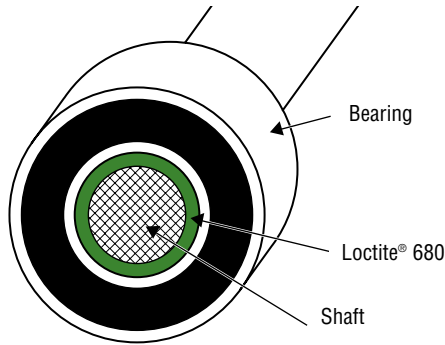
DISASSEMBLY

1. Pull assembly apart.
2. If necessary, apply localized heat (450°F for 5 minutes). Pull while hot.

RETAINING

Shaft Mounted Components

SLIP FIT - HIGH STRENGTH



ORIGINAL

1. Machine shaft to .002"-.004" diametral slip fit with 50-80 rms finish (second cut).
2. Clean all parts with Loctite® ODC-Free Cleaner & Degreaser.
3. Do NOT use Loctite® 7649 (Primer N).
4. Apply Loctite® 680 High Strength Retaining Compound around shaft and engagement area.
5. Assemble parts with rotating motion.
6. Wipe off excess.
7. Allow parts to fixture prior to service.

WORN SHAFT

Using Loctite® Quick Metal® 660, follow directions above except:

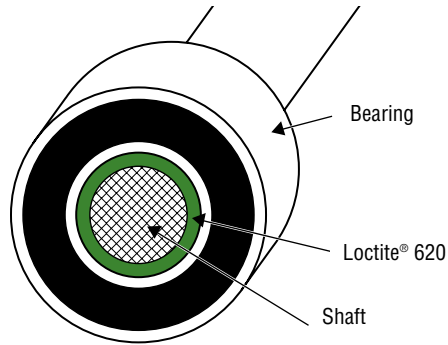
1. Determine diametral gap.
2. If diametral gap exceeds .010", Loctite® 7471 (Primer T) must be used.
3. Take steps to maintain concentricity with large gaps.
4. Larger gaps require longer cure times.

DISASSEMBLY

1. Pull assembly apart.
2. If necessary, apply localized heat (450°F for 5 minutes). Pull while hot.

Shaft Mounted Components

SLIP FIT - HIGH TEMPERATURE



ORIGINAL

1. Machine shaft to .002"-.004" diametral slip fit with 50-80 rms finish (second cut).
2. Clean all parts with Loctite® ODC-Free Cleaner & Degreaser.
3. Do NOT use Loctite® 7649 (Primer N).
4. Apply Loctite® 620 High Temperature Retaining Compound around shaft and engagement area.
5. Assemble parts with rotating motion.
6. Wipe off excess.
7. Allow parts to fixture prior to service.

WORN SHAFT

Using Loctite® Quick Metal® 660, follow directions above except:

1. Determine diametral gap.
2. If diametral gap exceeds .010", Loctite® 7649 (Primer N) must be used.
3. Take steps to maintain concentricity with large gaps.
4. Larger gaps require longer cure times.

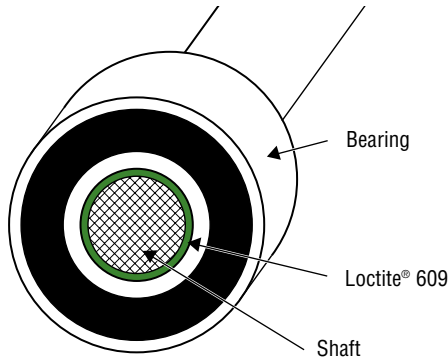
DISASSEMBLY

1. Pull assembly apart.
2. If necessary, apply localized heat (450°F for 5 minutes). Pull while hot.

RETAINING

Shaft Mounted Components

PRESS FIT



STANDARD

1. Clean shaft O.D. and Component I.D. with Loctite® ODC-Free Cleaner & Degreaser.
2. Apply a bead of Loctite® 609 General Purpose Retaining Compound to circumference of shaft at leading edge of insertion or leading area of engagement.

Notes:

- Retaining compound will always be squeezed to the outside when applied to shaft.
 - Do NOT use with Loctite® Anti-Seize or similar product.
3. Assemble press-fitted parts. Wipe off excess.
 4. No cure time typically required, however, allow parts to fixture prior to service.

Note: Loctite® 609 and Loctite® 603* Retaining Compounds are typically used in this application due to their low viscosity and wetting properties.

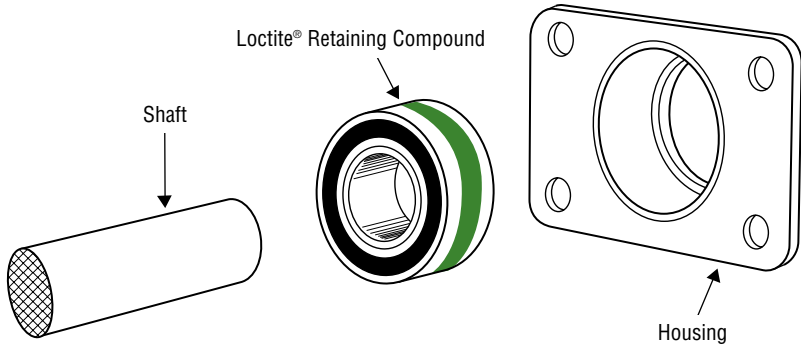
TANDEM MOUNT

1. Apply Loctite® Retaining Compound to bore of inside component.
2. Continue assembly as above.

* Worldwide or Application-Specific Alternative

Housed Components

SLIP FIT - HEAVY DUTY



ORIGINAL

1. Select component to fit shaft.
2. Machine to reduce component O.D. or housing I.D. to permit approximate .002" - .004" diametral slip fit.
3. Clean all parts with Loctite® ODC-Free Cleaner & Degreaser.
4. If both surfaces are inactive, apply Loctite® 7649 (Primer N) or Loctite® 7471 (Primer T) to one surface.
5. Apply a coating of Loctite® Retaining Compound to component O.D.
6. Install component with twisting motion.
7. Wipe off excess.
8. Allow parts to fixture prior to service.

WORN

Using Loctite® Quick Metal® 660, procedures are identical to original slip fit, except:

1. Determine the maximum diametral gap.
2. If the maximum diametral gap exceeds .010", then Loctite® 7649 (Primer N) must be used.
3. Take steps to maintain concentricity on large gaps.
4. Large gaps require longer cure times.
5. Quick Metal® 660 is not recommended for diametral gaps exceeding .010".

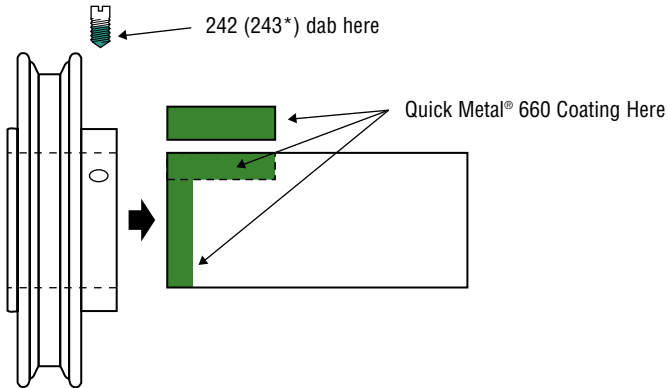
DISASSEMBLY

1. Pull assembly apart.
2. If necessary, apply localized heat (450° F for five minutes).
3. Pull while hot.

RETAINING

Strengthen Keyed Assemblies

KEYED ASSEMBLIES - HEAVY DUTY



ASSEMBLY

1. Clean all parts with Loctite® ODC-Free Cleaner & Degreaser.
2. Apply a coating of Loctite® Quick Metal® 660 Retaining Compound around shaft, into keyway and on key.
3. Assemble parts. Wipe off excess.
4. Apply medium strength Loctite® Threadlocker to screw.
5. Tighten set screw.
6. Allow parts to fixture prior to service.

Note: If diametral gap exceeds .010", use Loctite® 7649 (Primer N) on appropriate area (shaft or keyway).

DISASSEMBLY

1. Tap component and key with hammer.
2. If necessary, apply localized heat (450° for five minutes).
3. Pull while hot.

* Worldwide or Application-Specific Alternative

SURFACE PREPARATION



Why and How-to-Use **LOCTITE®** Primers

Loctite offers a complete line of primers to ensure the maximum performance of Loctite® Threadlockers and Retaining Compounds. Loctite® Primers are used to speed up and ensure cure on **inactive metals**.

Q. When should I use a primer?

A. Use a primer when **both** surfaces are considered inactive. It is necessary to apply the primer to one surface in most cases, unless gaps are excessive. See list below.

ACTIVE METALS		INACTIVE METALS	
Iron	Bronze	Plated Parts	Cadmium
Plain Steel	Nickel	Anodized Aluminum (Alodine, Irridite)	Magnesium
Copper	Manganese	Titanium	Natural or Chemical Black Oxide
Brass	Monel	Stainless Steel	Magnetite Steel
Commercial Aluminum (with copper content, e.g. 6061)	Kovar	Galvanized Steel	Iconel
		Zinc	Silver
		Pure Aluminum	Gold
			Plastics

APPLICATION TIP:

1. Just spray one of the metal parts to be bonded. Allow 30 seconds to dry.
2. Apply adhesive to unprimed part. Assemble.

Why and How-to-Use **LOCTITE®** Cleaners

Loctite offers a complete line of highly effective general purpose or application specific cleaners and degreasers. Included are both aqueous and solvent-based products, all of which are free of Class I ozone-depleting compounds.





THREADLOCKING

ORDERING INFORMATION

Product	Item Number	Container	Typical Use	Color	Viscosity cP	Torque in. lbs. (M10 Steel Nuts & Bolts) Break/Prevail	Temperature Range	Cure Speed, Steel @25°C (Fixture/Full)	Oil Tolerant	Recommended Primer	Specific Gravity	Key Specifications
222	21463	10 ml bottle	Small screws under 1/4"	Purple	1,200/ 5,000 Thixotropic	53/30	-65°F to 300°F	20 min./24 hrs.	-	N or T	1.05	-
	21464	50 ml bottle										
	21465	250 ml bottle										
222MS	22205	.5 ml capsule	Easy removal small screws	Purple	1,200/ 6,000 Thixotropic	62/27	-65°F to 300°F	20 min./24 hrs.	-	N or T	1.05	3
	22221	10 ml bottle										
	22231	50 ml bottle										
	22241	250 ml bottle										
242*	24205	.5 ml capsule	Removable grade up to 3/4" bolts	Blue	1,200/ 6,000 Thixotropic	115/53	-65°F to 300°F	10 min./24 hrs.	-	N or T	1.07	4, 8
	24221	10 ml bottle										
	24231	50 ml bottle										
	24241	250 ml bottle										
	24243	1 liter bottle										
243	23977	.5 ml capsule	Up to 3/4" bolts with light oil contamination	Blue	2,250/ 12,000 Thixotropic	180/62	-65°F to 300°F	10 min./24 hrs.	Yes	N or T	1.08	8, 7
	24077	10 ml bottle										
	24078	50 ml bottle										
	24079	250 ml bottle										
	21433	1 liter bottle										
246	29512	.5 ml capsule	High temperature medium strength	Blue	2,600	170/48	-65°F to 450°F	7 min./24 hrs.	Yes	N or T	1.15	-
	29513	10 ml bottle										
	29514	50 ml bottle										
	29515	250 ml bottle										
262	26205	.5 ml capsule	Permanent locking up to 3/4" bolts	Red	1,800/ 5,000 Thixotropic	190/275	-65°F to 300°F	20 min./24 hrs.	-	N or T	1.05	5, 7
	26221	10 ml bottle										
	26231	50 ml bottle										
	26241	250 ml bottle										
	26243	1 liter bottle										
266	26771	.5 ml capsule	High strength high temperature	Red-orange	3,750- 9,000	270/35	-65°F to 450°F	40 min./24 hrs.	Yes	T	1.19	-
	26772	10 ml bottle										
	26773	50 ml bottle										
	26774	250 ml bottle										
271™	27105	.5 ml capsule	High strength for fasteners up to 1" diam.	Red	500	230/320	-65°F to 300°F	10 min./24 hrs.	-	N or T	1.12	1, 9
	27121	10 ml bottle										
	27131	50 ml bottle										
	27141	250 ml bottle										
272	27240	50 ml bottle	High temperature applications	Red	9,500	200/220	-65°F to 450°F	30 min./24 hrs.	-	N or T	1.11	-
	27270	250 ml bottle										
	27285	1 liter bottle										
277	21434	10 ml bottle	High strength for large bolts	Red	7,000	275/275	-65°F to 300°F	30 min./24 hrs.	-	N or T	1.12	2
	27731	50 ml bottle										
	27741	250 ml bottle										
	27743	1 liter bottle										
290	29005	.5 ml capsule	Wicking grade for pre-assembled parts	Green	12	85/250	-65°F to 300°F	20 min./24 hrs.	-	N or T	1.08	6, 8
	29021	10 ml bottle										
	29031	50 ml bottle										
	29041	250 ml bottle										
	29043	1 liter bottle										
294	27934	.5 ml capsule	High temperature wicking grade	Green	34.5	289/237	-65°F to 400°F	10 min./24 hrs.	Yes	N or T	1.12	-
	27935	10 ml bottle										
	27936	50 ml bottle										
	27937	250 ml bottle										




1 = Mil S-46163A, Type I, Grade K
 2 = Mil S-46163A, Type I, Grade L
 3 = Mil S-46163A, Type I, Grade M
 4 = Mil S-46163A, Type II, Grade N

5 = Mil S-46163A, Type II, Grade O
 6 = Mil S-46163A, Type III, Grade R
 7 = Agriculture Canada approved
 8 = NSF/ANSI 61 certified
 9 = UL classified

Indicates worldwide availability

RETAINING

ORDERING INFORMATION

Product	Item Number	Container	Typical Use	Color	Viscosity cP	Gap Fill (Diameter)	Temperature Range	Cure Speed, Steel @25°C (Fixture/Full)	Shear Strength Steel/Steel (PSI)*	Recommended Primer	Specific Gravity	by Specifications
	21440	10 ml bottle	For close fitting parts with light contamination	Green	125	.005"	-65°F to 300°F	30 min./24 hrs.	3,770	T	1.10	-
	21441	50 ml bottle										
	21442	250 ml bottle										
609	60905	.5 ml capsule	1st generation to augment press fits	Green	125	.005"	-65°F to 300°F	10 min./24 hrs.	3,000	T	1.10	1
	60921	10 ml bottle										
	60931	50 ml bottle										
	60941	250 ml bottle										
	62005	.5 ml capsule	For high temperature applications	Green	8,500/22,000 Thixotropic	.015"	-65°F to 300°F	1 hr./24 hrs.	3,800	N	1.16	-
	62015	10 ml bottle										
	62040	50 ml bottle										
	62070	250 ml bottle										
635	63531	50 ml bottle	1st generation high strength for slip fits	Green	2,000	.010"	-65°F to 300°F	1 hr./24 hrs.	4,000	T	1.05	3
	63541	250 ml bottle										
638	21447	10 ml bottle	High strength for loose fitted parts	Green	2,500	.010"	-65°F to 300°F	5 min./24 hrs.	4,500	T	1.09	-
	21448	50 ml bottle										
	21449	250 ml bottle										
640	64031	50 ml bottle	For high temperature applications	Green	600	.007"	-65°F to 400°F	1 hr./24 hrs.	3,000	T	1.12	2
	64041	250 ml bottle										
	28802	10 ml bottle	Medium strength for removable bearings	Yellow	525/1,950 Thixotropic	.008"	-65°F to 300°F	30 min./24 hrs.	1,700	N	1.07	-
	21458	50 ml bottle										
	28801	250 ml bottle										
648	21443	10 ml bottle	Fast fixturing for close fitting parts	Green	500	.006"	-65°F to 300°F	5 min./24 hrs.	3,900	N	1.13	-
	21444	50 ml bottle										
	21445	250 ml bottle										
660	66010	6 ml tube	For repair of worn machinery parts	Silver	250,000/1,500,000	.020"	-65°F to 300°F	10 min./24 hrs.	3,335	N or T	1.13	4
	66040	50 ml tube										
	30287	250 ml tube										
	66141	250 ml bottle	Fast anaerobic curing	Amber	500	.006"	-65°F to 300°F	5 min./24 hrs.	3,500	T	1.11	-
675	67541	250 ml bottle	1st generation for close fitting parts	Green	125	.005"	-65°F to 300°F	20 min./24 hrs.	3,000	T	1.09	1
680	68005	.5 ml capsule	High strength for slip fitted parts	Green	1,250	.015"	-65°F to 300°F	10 min./24 hrs.	4,000	T	1.11	5
	68015	10 ml bottle										
	68035	50 ml bottle										
	68060	250 ml bottle										

1 = Mil R-46082B, Type I

2 = Mil R-46082B, Type II

3 = Mil R-46082B, Type III

4 = Agriculture Canada approved

5 = NSF/ANSI 61 certified





Indicates worldwide availability




SURFACE PREPARATION

PRIMERS ORDERING INFORMATION

Product	Item Number	Container	Color	Viscosity (cPs)	Base	On-Part Life	Dry Time
736	22490 73656	1 qt. can 6 oz. aerosol can	Brown	3	Trichloroethylene isopropyl alcohol	30 minutes	3 minutes
7090	19368 12695	1 fl. oz. bottle 1 liter bottle	Light amber	3	No solvent	1 hours	<10 minutes
7471 	19267 22477 19268	1.75 fl. oz. bottle 4.5 oz. aerosol can 1 gallon can	Amber	2	Acetone/ Isopropanol	7 days	30-70 seconds
7644	25727	1.75 fl. oz. aluminum bottle	Clear/ blue-green	1	Decafluoropentane	30 days	20-30 seconds
7649 	19269 21347 21348 19266	1.75 fl. oz. bottle 25 gm aerosol can 4.5 oz. aerosol can 1 gallon can	Clear/green	2	Acetone	30 days	30-70 seconds

CLEANERS ORDERING INFORMATION

Product	Item Number	Container	Drying Time	Residue/ Rinsability	Odor
Natural Blue® Cleaner & Degreaser	82244 82249 82251 82253 82254 82255	4 fl. oz. bottle 24 fl. oz. spray bottle 1 gal. bottle 5 gal. pail 15 gal. pail 55 gal. drum	Equivalent to the evaporation rate of water. Wiping or blowers will accelerate dry time.	Rinses residue free with water	Pine scent
ODC-Free Cleaner & Degreaser	22355 20162 20260	15 oz. net wt. aerosol 16 fl. oz. pump spray 1 gal. can	5-20 minutes (without wipe) 1-2 minutes (with wipe)	No rinse and no residue	Mild citrus
Pro Strength Parts Cleaner	30548	19 oz. net wt. aerosol	5-15 minutes	No rinse and no residue	Mild solvent

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