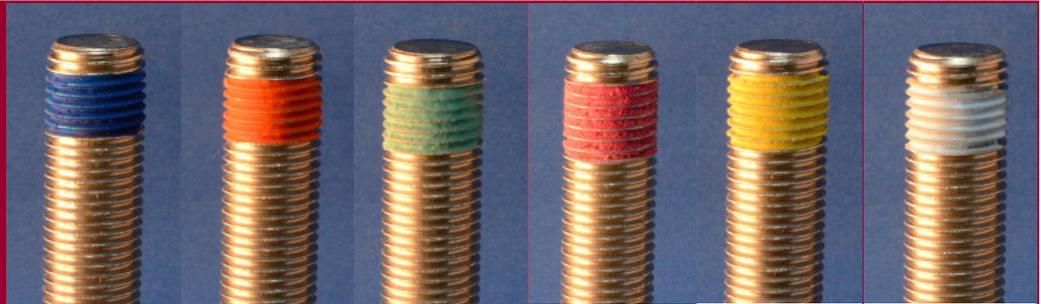


Reactive Thread Locking



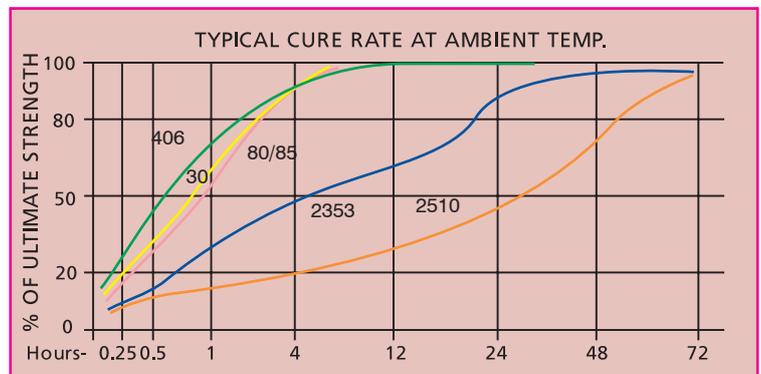
PRE-APPLIED MICRO ENCAPSULATED ADHESIVES FOR IMPROVED BREAK LOOSE AND/OR SEALING PERFORMANCE ON MALE THREADED COMPONENTS



PRODUCT	3M™ Adhesive	3M™ Adhesive	PRECOTE®	PRECOTE®	PRECOTE®	HYLOLOC®
PRODUCT NUMBER	2353	2510	85	80	30	406
MATERIAL	EPOXY RESIN	EPOXY RESIN	ACRYLIC	ACRYLIC	ACRYLIC	ACRYLIC
COLOUR	BLUE	ORANGE	TURQUOISE	PINK	YELLOW	Lt BLUE
SEALING CAPACITY BAR	>200	>200	>400	>400	>250	TBA
TEMPERATURE RANGE °C	-80 +115	-40 +150	-50 +150	-50 +170	-50 +150	-50 +150
RELATIVE PERFORMANCE	COST EFFECTIVE	MEDIUM TEMPERATURE	HIGH STRENGTH	HIGH STRENGTH	LOW STRENGTH	WATER BASED
SPECIFICATIONS	SEE NOTE 'A'	SEE NOTE 'C'	SEE NOTE 'A'	SEE NOTE 'A'	SEE NOTE 'B'	SEE NOTE 'D'
COEFFICIENT OF FRICTION	0.12 - 0.17	0.25 - 0.28	0.1-0.15	0.25 - 0.28	0.1 - 0.15	0.1 - 0.15
ON PART LIFE AMBIENT TEMP	>2 YEARS	>2 YEARS	>4 YEARS	>4 YEARS	>4 YEARS	>4YEARS

Table:extract from BS7795:1995

Thread size	Breakaway Torque Nm	
	Maximum	Minimum
M6 x 1	8	2
M8 x 1.25	24	4
M10 x 1.5	44	10
M12 x 1.75	80	15
M14 x 2	130	20
M16 x 2	160	30



Note:

- All pre applied adhesives and sealants perform to BS7795 Part1.
- Performance values are based upon adhesive area for a distance of one nominal screw diameter assembled into a steel nut.
- Reusability is not recommended with micro-encapsulated adhesives.

The materials shown here are only a small section of the range that Inlex Locking offers

For further information please contact one of our application engineers who will be able to offer advice on the correct solution.

These material are able to meet the requirements of;

Note 'A'	FORD WX200 & 201 BS7795:1995 IFI 125/525 GM 6175M CAT 1E 2486 FORD WSS M11P45-A1 FORS ESS M11P24-A2 FORD ESA M2G200-A PERKINS PMS P.1.05	Note 'C'	FORD WSK M2G354-A1/A9 FORD ESA - M2 G200-A FORD ESS - M11P24-A1 LRES 22 FR 01 JES 22 FP 01 PERKINS PMS P.1.06 BS7795 : 1995 GM 6193M
Note 'B'	WSS-M18 P12-A WX201 PERKINS PMS P.1.02	Note 'D'	WX200 GM6194M



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Reactive Thread Locking



inlex

LOCKING

FEATURE	CHARACTERISTICS
3M™ Adhesive 2353 (Blue) (High strength Medium Temp adhesive)	Adhesive 2353 is a specially formulated two part epoxy system in a micro-encapsulated form. Inert and dry to touch until activated during assembly, it provides a high resistance to loosening by virtue of the high break loose/ breakaway torques and subsequent prevailing off torque. 3M® strength after 24 hours cure at ambient temperature. The high strength locking and sealing performance of 2353 makes it suitable for all fastening applications up to 115°C. This product can be applied to a variety of materials such as brass, steel, copper and plastic. Suitable for a wide range of fastener products. Meets the requirements of high prevailing off torques with high re-use abilities.
3M™ Adhesive 2510 (orange) (High strength Medium Temp adhesive)	3M™ Adhesive 2510 is specifically designed to operate at temperatures up to 150°C. 3M® Adhesive 2510 is a two part epoxy system in micro-encapsulated form. Inert and dry to touch until activated during assembly, it provides high strength/high temperature performances achieving full adhesive strength after 72 hours cure at ambient temperature. Adhesive 2510 has very good sealing properties, impervious to most commonly used chemicals and liquids such as water, oil, grease etc..
Precote® 85 (Turquoise) (High strength Medium Temp adhesive)	Precote® 85 is a dry to touch, micro-encapsulated thread precoating system with an acrylate base. The dry film is non-tacky, solvent free and is harmless from both a physiological and toxicological point of view. Its characteristics as a high strength locking and sealing element become effective after the capsules are ruptured during assembly with the mating threads, although the final bond strength is not as high as Precote 80, this material does have a low thread friction value
Precote® 80 (Pink) (High strength Medium Temp adhesive)	Precote® 80 is a dry to touch, micro-encapsulated thread precoating system with an acrylate base. The dry film is non-tacky, solvent free and is harmless from both a physiological and toxicological point of view. Its characteristics as a high strength locking and sealing element become effective after the capsules are ruptured during assembly with the mating threads.
Precote® 30 (Yellow) (Low strength Medium Temp adhesive)	Precote® 30 is a micro-encapsulated thread precoating system with an acrylate base. The dry film is non-tacky, solvent-free and is harmless from the physiological and toxicological point of view. Its characteristics as a sealing and locking element with medium strength become effective on assembly, after the capsules are ruptured by shear and/or pressure stress.
Hyloloc® 406 (Red) (Water based adhesive)	<p>Hyloloc® 406 is a pre-applied anaerobic reactive thread locking and sealing compound.</p> <p>It is a two part system comprising of a water based methacrylate resin and microencapsulated curing agents. It is applied in a liquid form and then cured to create a dry, non tacky thread coating, clearly visible and suitable for shipment. When assembled by the end user, pressure and shear stress rupture the microencapsulates causing the liquid content to mix and harden within the binder system. The desired locking and sealing properties are thus achieved.</p> <p>It is an environmentally friendly water based non-hazardous hygienic dry to touch coating, after application and drying it is red therefore clearly visible in usage.</p> <p>To give additional threaded joint security by adhesive locking the male and female components, and also giving a sealant benefit by its thread filling capabilities.</p> <p>Hyloloc 406 has many benefits over other traditional thread locking adhesives systems, namely its fast reaction time and its green credentials being water based.</p> <p>It has been tested in use against all automotive fluids at temperatures ranging from -50 to +150, it gives good break loose and prevailing off torque in line with all compatible solvent based alternatives.</p>

Information presented in this data sheet is considered reliable, but conditions and methods of use, which are beyond our control, may modify results. Before these product are used, the user should confirm their suitability.

We cannot accept liability for any loss, injury or damage which may result from its use. We do not warranty the accuracy or completeness of any such information whether orally or in writing. We reserve the right at anytime and without notice to update or improve products and processes and our information concerning the same.



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Reactive Thread Locking

Pre-Applied Adhesives

This type of feature involves two possible methods of application, pre-applied and applied-in-place.

These features offer lower assembly torque than that achievable from prevailing torque type fasteners. Additionally, high breakaway torques are achieved due to the solid fill from the adhesive coating after full cure.

Both pre-applied (micro-encapsulated) and applied-in-place (liquid) chemical adhesives offer the locking reliability characteristics of most other self-locking fastener types. In-place chemical application, however, liquid chemical additives offer just 'one-time' use and additional assembly time is required to coat the fastener with the additive.

Downtime, application errors and contamination of other assembly parts are all inherent risks with in-place application of liquid chemical additive fasteners.

The pre-applied adhesives are usually an anaerobic type, or a two part epoxy, with the material positioned in a band around the threads and dry to the touch. When the fastener is rotated against its mating part, the capsules of adhesive burst, releasing the material in and around the thread flanks, which then cures and forms the locking bond. Since the adhesive coating is pre-applied, the assembly time for these fasteners is substantially less than for applied-in-place coatings.

The bond also is more consistent. Multiple reuse of a pre-applied chemical locking fastener is not recommended, since the relocking action depends upon the amount of reusable adhesive left on the bolt after the first installation. Most engineers design for a maximum of one installation before the bolt must be recoated, or replaced.

N.B. Pneumatic installation tools depend upon air pressure and volume to achieve a given desired tightening torque. Prevailing torque features may cause stalling if the air pressure and volume is insufficient for continuous 'run-down' under prevailing torque conditions.

Glossary

Definitions Terms commonly used to describe self locking performance:

Prevailing Torque

The torque necessary to rotate the bolt screw or stud in a mating threaded component while in motion and with no axial load.

Breakloose Torque

The torque necessary to effect reverse rotation of the bolt, screw or stud when in tension.

Breakaway Torque

The torque necessary to effect reverse rotation of the bolt, screw or stud when not in tension.

Clamping Force

The clamping force is that force which is applied by the bearing face of the fastener against a mating component after application of a tightening torque.

Clamping Load

The tensile load induced in the fastener by application of a tightening torque.

Tightening Torque (or Seating Torque or Installation Torque)

The torque required to induce a clamping load in the fastener.
Note: Testing is usually carried out at 75% of proof load.

Torque/Tension (or Torque/Clamping load)

The torque required to give an induced load/tension in the fastener.