

# Uni-TechSpace

## Uni-Patch<sup>®</sup> 688

An Environmentally Sustainable Thread Locker



# Uni-Patch® 688



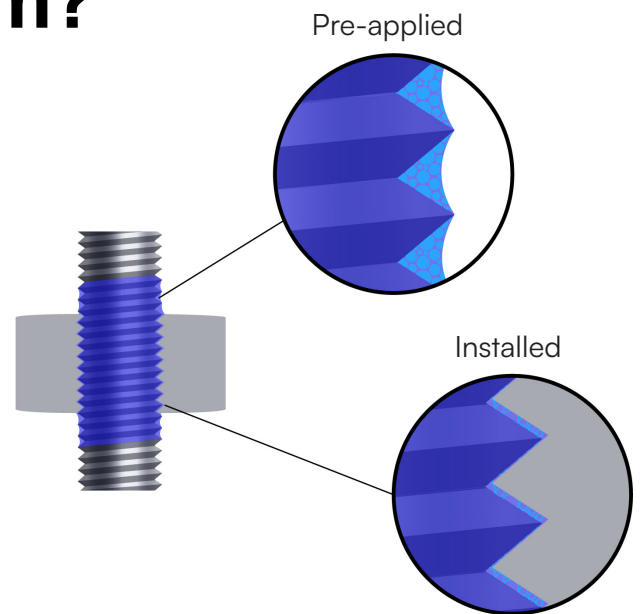
Uni-Patch® 688 is a water based, room-temperature curing, micro-encapsulated adhesive thread locker. They can be applied to virtually all thread sizes (as small as M0.8), configurations, compositions and finishes.

It contains micro-encapsulated reactive elements that are suspended in a quick-curing resin, carried in a water medium. Because it does not use any solvents, it is low in VOC.

## How does Uni-Patch® 688 perform?

During assembly, the engagement between the fastener and the mating part causes a shearing force that breaks the capsules, allowing the reactive compounds in Uni-Patch® 688 to cure into a tough, well-bonded polymer. The resulting matrix rapidly bonds the surfaces, semi-permanently locking parts together. The bonded surfaces in the threads provide heat, fluid, vibration, thermal and mechanical shock resistance to the assembled joint.

Uni-Patch® 688 offers consistent and predictable torque values and requires no heat or primers for curing after assembly.



Characteristics	Description
Chemical type	Epoxy adhesive (Water based formulation for low VOC and environmentally friendly)
Appearance	Blue (Standard)
	Other colours are available, please check with Unisteel for options available.
Re-usability	Recommended single use only for best thread locking performance. Reusability may be established through application testing on a case by case basis.
Coating position and thread size	Position is customisable. For M2.0 to M0.8
Coating radial coverage	360°

# Features

## Formulated for miniature fasteners

Uni-Patch® 688 materials is specifically designed for miniature fasteners. Capsule sizes are specifically formulated to fill the threads profile to achieve best optimal thread locking performance.



## No solvents no odour

Uni-Patch® 688 has been formulated to have near-zero volatile organic compounds and is odourless in both liquid and solid forms for easy, non-hazardous, environmentally conscious application. It is RoHS compliant.

## Convenient handling

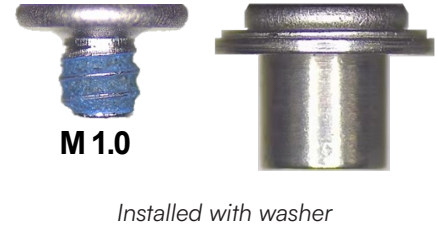
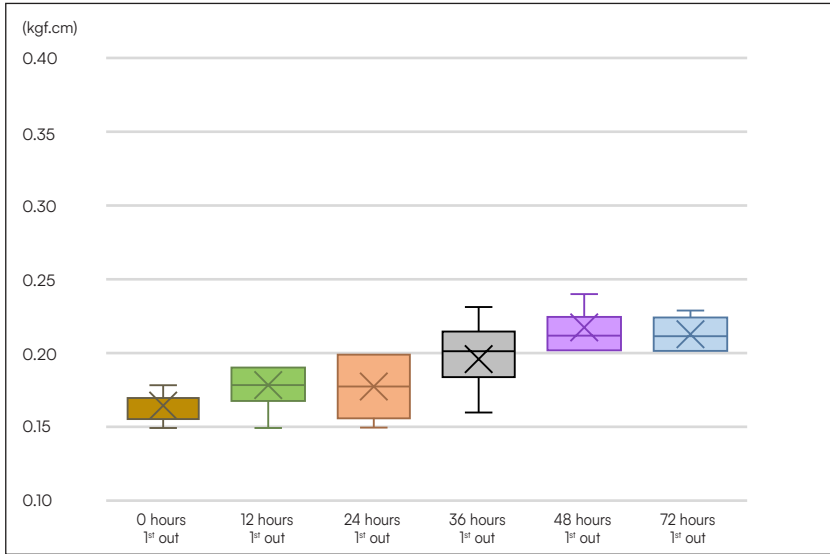
Uni-Patch® 688 is pre-applied to the specific position of the threads of fasteners. It comes dry to touch, providing ease of use for mass-production assembly lines, saving costs in handling when compared to traditional wet thread lockers. Other colours are available upon request for identification purposes.



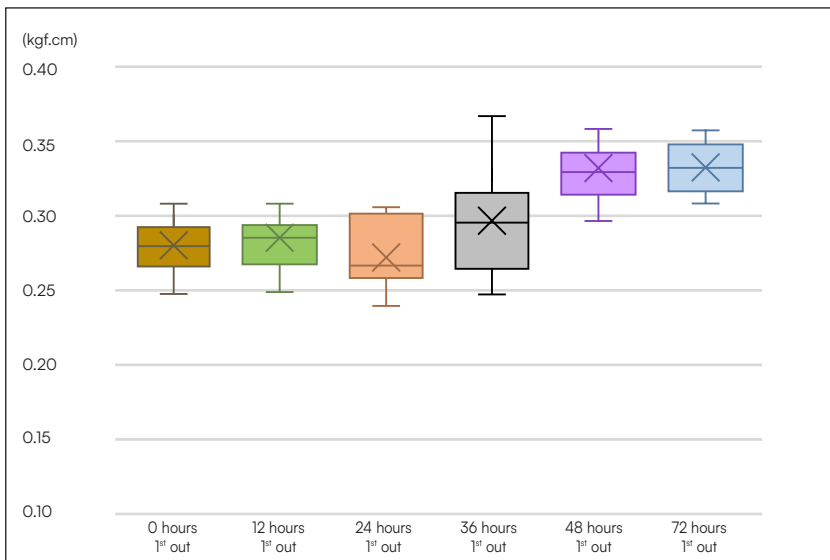
## Fast fixture times

Uni-Patch® 688 thread fixture is achieved within 12hrs after installation. Complete cure progresses over 48 hours (in room temperature conditions).

### M1.0 breakaway torque vs. cure time



### M1.2 breakaway torque vs. cure time



As a kind of micro capsulated chemical reactive thread locker, Uni-Patch® 688's release torque increases with time and curing is nearly complete at 48 hours.

## Consistent anti-loosening properties

Uni-Patch® 688 achieves consistent breakaway torques (after minimum of 48 hours after 1st assembly). It is also highly resistant to thermal, vibrational, and mechanical shocks. Typical breakaway torque is possible to achieve 75% of the installation torque applied, and it also bonds to most fasteners' finishing. To obtain the best results, ensure the surfaces are oil-free where Uni-Patch® 688 is applied.

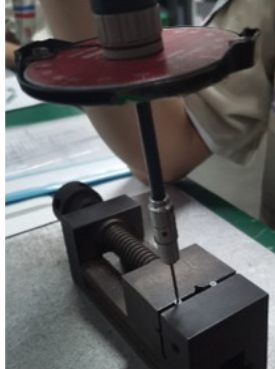
## Prevailing torque in/out comparison

Test machine & method:

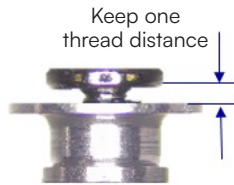
Screw into SUS nut manually, slowly and vertically

Keep one thread distance to the bottom

Record prevailing-in torque



Fix nut by the fixture



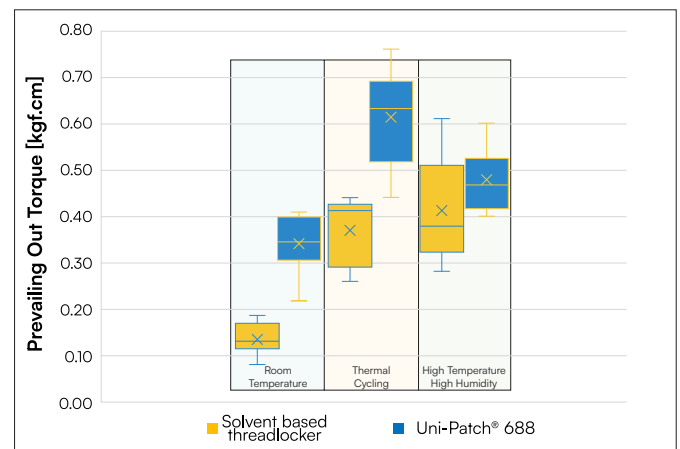
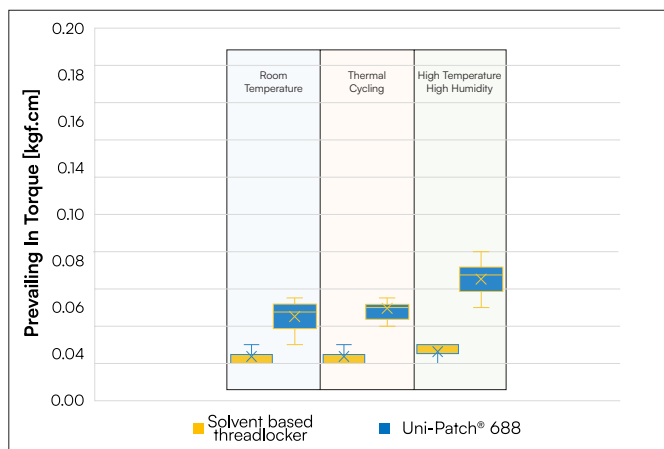
Don't screw to the bottom

**M 1.2**



**Manual Torque Wrench**  
0.03 - 0.20kgf.cm

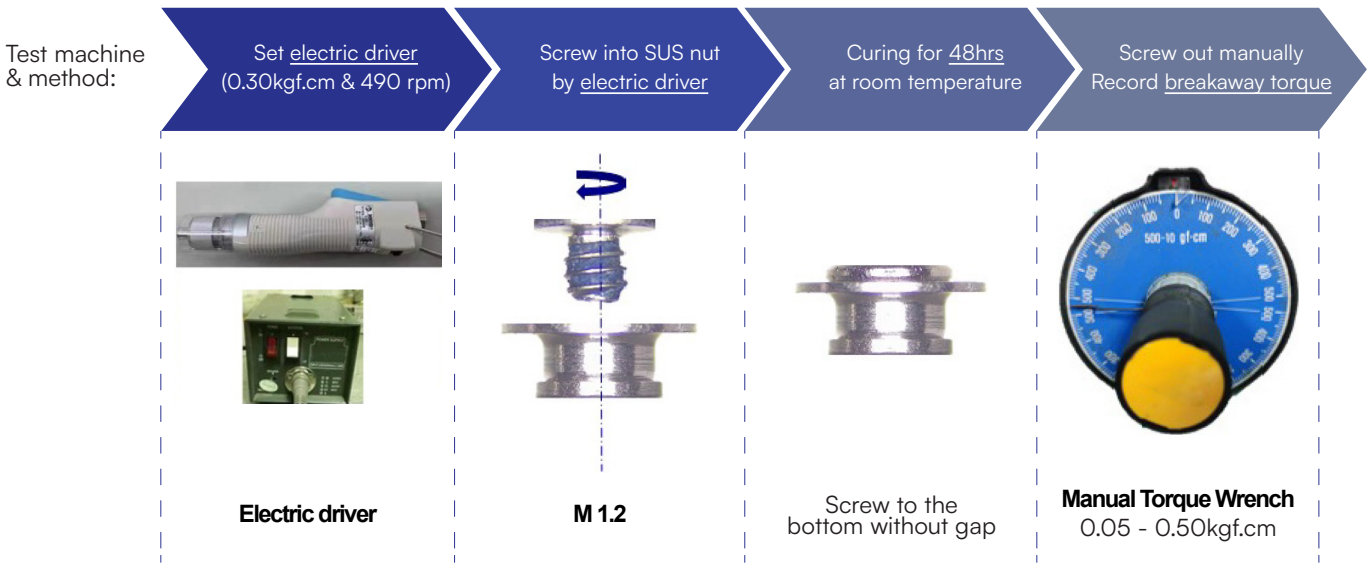
Following the assembly, the samples are allowed to cure in room temperature for 48 hours. The graph below depicts the prevailing out-torque results:



## Observation

With similar 1st-In torque, Uni-Patch® 688 also has a higher 1st-Out prevailing torque when compared with a solvent based threadlocker under the various conditions.

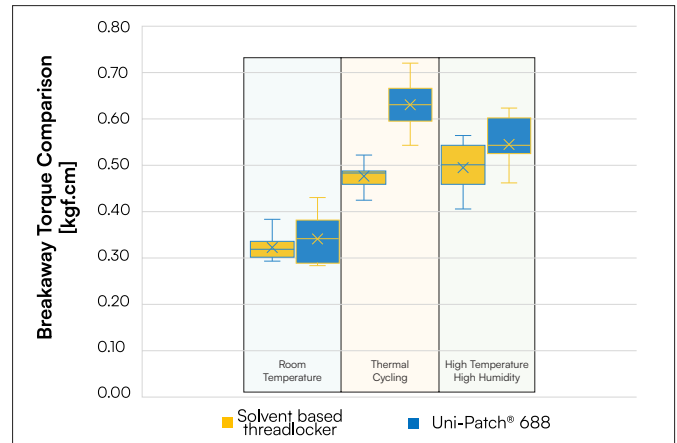
## Breakaway torque comparison



The following conditions are applied to the test samples (see Table 1). Following the assembly, the samples were cured in room temperature for 48 hours. The graph depicts the breakaway torque results:

Table 1:

Screw size	M1.2
Tightening torque	0.5 kgf.cm
Thermal cycle	-20°C to 120°C, 19 cycles
High temperature high humidity	85°C @ 85% RH for 48hours



## Observation

At room temperature, Uni-Patch® 688 has the same breakaway torque as the solvent based threadlocker. For Thermal Cycling and High Temperature High Humidity Reliability Tests, Uni-Patch® 688 anti-loosening advantage is clearly superior.

# Vibration resistance test

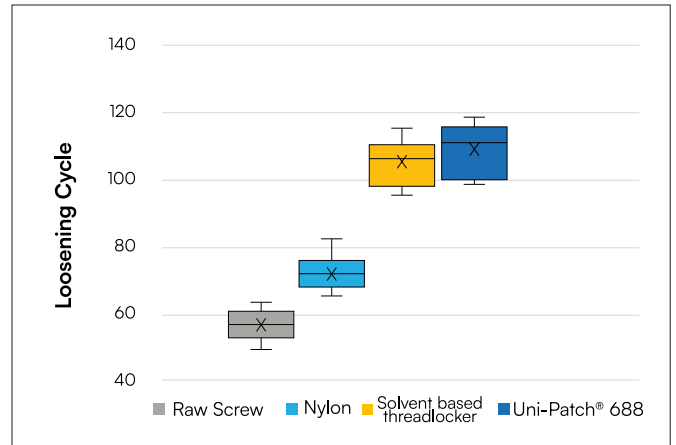
A Junker Test (see Image 1) is performed on miniature screws to determine the point at which a bolted joint loses its preload when subjected to shear loading caused by transverse vibration. The table shows the condition of the test (see Table 2). With this test, Uni-Patch® 688 outperformed the other screws, with the results doubling the vibration loosening performance when compared to screws without thread locking.



Image 1: Junkers Test Equipment

Table 2:

Screw size	M1.4
Tightening torque	2kgf.cm
Frequency	10 Hz
Displacement	0.1mm



# Benefits of Uni-Patch® 688

Uni-Patch® 688 is a micro-encapsulated, room-temperature curing adhesive thread locker that provides numerous advantages, including:

1. Low VOC water-based formulation that is environmentally friendly and RoHS compliant
2. Micro-encapsulated adhesive with a long shelf life both before and after application
3. Has a higher resistance to vibration when compared to other micro-encapsulated thread lock coatings in the market, which prevents screws from coming loose when the product is dropped or subjected to shock.
4. Variable colour options and position customisation are possible for screws ranging from M2.0 to M0.8.

As with micro-encapsulated thread lock coatings, a minimum of 48hours of curing time is needed to ensure maximum breakaway torque of the joint. Uni-Patch® 688 provides equal or better thread locking performance when compared to other available micro-encapsulated thread lock coatings for miniature screws in the market.

Uni-Patch® 688 has a wide range of applications, especially in consumer electronics where miniature screws are commonly used. Uni-Patch® 688 will maintain the quality of your products while adding value to them. Fully developed and coated in-house by Unisteel and by using cutting-edge machines, Unisteel strives to provide value-added solutions to our customers by allowing full control on design, quality, and delivery.

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For more information about our products and services, please contact your nearest Unisteel representative. Alternatively, contact us at [sales@unisteeltech.com](mailto:sales@unisteeltech.com) or visit our website at [www.unisteeltech.com](http://www.unisteeltech.com)