

TufLok®/Nytemp® for self-locking external threads ...



TufLok® „der blaue Fleck“ (the blue patch) has proven highly successful in practical applications around the globe: In the automotive engineering industry, in heavy-duty machinery, fittings and appliance construction, in hydraulic systems, electrical and precision mechanics and in optical applications.

The TufLok®-spot is also suitable for use wherever other systems are unable to meet requirements for technical or economic reasons:

- For extremely small screws – from M 0,8
- For screws made of hard materials
- For screws whose cross-section must not be weakened
- For threaded bolts

Field of application

- TufLok®: Temperature resistant from -56° to +120°C. Following prior practical testing, applications up to +150°C are possible.
- Nytemp®: For high-temperature screw locking for continuous thermal stress of up to 200°C (higher thermal stress also possible for short periods).
- TufLok®: Does not dry out, shrink or decompose, has a practically unlimited storage life. Resistant to alcohol, oil, petrol and most thinners.

The TufLok®-coating is also suitable for use in the food industry.

Product features

- Excellent locking effect compared to other methods; even if screws are not correctly tightened.
- Vibration-resistant in every screw-in position. This makes the TufLok® screw ideally suited as an adjusting screw.
- Fluid and gas-tight seal. The nylon layer presses firmly into the flanks of the thread, so preventing the ingress of media. All-round coating is recommended for these applications.
- Replaces positive locking elements which are often forgotten and lost during assembly. The blue TufLok® dot is an integral part of the screw and cannot be lost.
- Multiple use. The highly elastic blue TufLok® spot always endeavours to regain its original shape. Its system typical spray edge area safeguards the contact surface from shearing off.
- No drying time whatsoever required – immediately capable of withstanding stress. No problems also when tightening the TufLok® screw during final installation.
- Suitable for all metallic materials, also for threaded components made of stainless steels, light alloys and brass, as well as for almost all surface-treated parts.

Installation

TufLok® screws are mounted either mechanically or manually using conventional tools. The TufLok® screw enhances productivity due to its capacity for fully automatic feed and installation. The female thread does not need to be free of oil or grease, so allowing torque levels to be decreased.

Coating

Coating takes place in accordance with works standard 900.1.

It is also possible for galvanized screws to be chromated after TufLok® coating; The concentration of nitric acid for activation of the zinc coat may not exceed five percent, it should always be kept as low as possible.

Optimum results are achieved with a clean, smooth and chip-free nut thread in the medium tolerance category. We generally recommend countersinking the female thread.

The TufLok® system can be used without problems in running production series without any need for tool modification.

Most special requirements relating to the position of the coating and the degree of torque can be accommodated.

Testing

Testing generally takes place in accordance with WS 900.1.

Other test methods must always be specified, and can include:

- DIN 267, part 28
- Customer test specimen with torque specification



**Thread coating with nylon
Clamping coating**
in accordance with DIN 267, Part 28

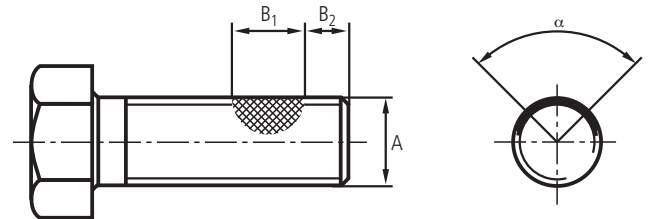
TufLok®/Nytemp®
Works Standard 900.1

Application

For the manufacture of ready-to-assemble, self-locking and sealing screws and threaded parts from M 0,8 to M 68.

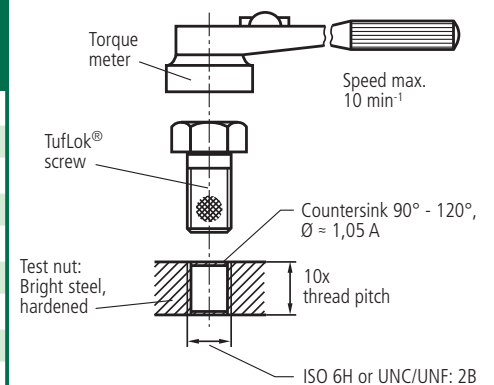
Normal coating:

Coating angle α in the screw body area $\approx 90^\circ$, edge zone (spray transition) up to $\approx 180^\circ$. Coating length $B_1 \approx 4$ to 6 thread turns. Around 2 to 3 thread turns remain uncoated to ensure flawless installation (B_2).



Torque levels according to Works Standard

Screws ISO 6g A	I screwing in max. Nm	II First unscrewing min. Nm	III Fifth unscrewing min. Nm
M 2	0,2	0,04	0,02
M 2,5	0,3	0,06	0,03
M 3	0,45	0,1	0,05
M 3,5	0,7	0,2	0,1
M 4	0,9	0,28	0,17
M 5	1,6	0,4	0,23
M 6	3	0,8	0,4
M 8	6	1,5	0,8
M 10	9,5	2,3	1,2
M 12	13	3,4	1,7
M 14	19	4,5	2,3
M 16	28	7	3,5
M 18	36	9	4
M 20	44	11	5,5
M 22	60	15	7,5
M 24	80	20	10



Torque testing

1. Torque testing should be carried out using properly calibrated gauges
2. Turn the screw into the test nut until the coating is positioned within the nut, measuring the maximum screw-in torque (max. values, see table, column I).
3. Back the screw out 90° , then measure the greatest torque during the following 360° (for target value, see table, column II).
4. Back the screw out completely from the test nut four times and then screw back in again. During the fifth unscrewing process, once again measure the greatest torque level during the first 360° (for target value, see table, column III).

The values specified in the table assume the use of screws whose material and surface quality are homogenous.

Special versions

Deviating coating lengths, spot or all-round coating and/or other coating positions. Deviating torque levels and values for different test methods (nut corresponding to DIN 267, part 28) or other screw dimensions respectively tolerances: Test coating required.

Alongside the standard colours blue for TufLok® and orange for Nytemp®, other colours can be supplied on request for purposes of differentiation (e.g. inch/metric, different strength classes and for identifying small dimensions, for example M1/M1,2).

Animation



TufLok®/Nytemp® for self locking internal threads ...



Self-locking internal threads are coated with a highly elastic nylon layer, TufLok® – „der blaue Fleck“ (the blue patch).

When screwing on the internal thread, this blue TufLok® spot brings about a high level of surface pressure against the flanks of the mating thread.

The nylon layer also fills out the axial backlash between the threads of the screw and nut, producing a vibration-proof connection which prevents the thread from working loose under dynamic stress, but can be released at any time.

Field of application

Self-locking TufLok® internal threads have proven highly successful throughout every branch of industry, for example in automotive engineering, and in all types of constructions and appliances – particularly where there is a danger of parts working loose from machines or vehicles in operation.

Product features

- The TufLok® internal thread coating brings about a high degree of locking safety.
- The self-locking TufLok® nut can be quickly and simply installed, either manually or using fully automatic screwing devices. It is ideal for precise setting work.
- In contrast to lock nuts with deformed threads or tothing, the TufLok® nut prevents any surface damage to the workpiece, thread erosion, as well as abrasion or damage to the screw thread.
- Additional locking elements can be dispensed with, meaning cost savings due to lower outlay for storage, scheduling and inventory management.
- The „built-in locking effect“ can never be left out accidentally during installation or be lost during repairs – meaning added security..
- The TufLok® internal thread is reusable.
- TufLok®: Temperature resistant from -56°C to +120°C. Following prior practical testing, applications up to +150°C are possible.
- Nytemp®: For higher continuous thermal stress of up to 200°C (higher stress levels possible for short periods).



**Thread coating with nylon
Clamping coating**
similarly DIN EN ISO 2320

TufLok®/Nytemp®
Works Standard 945

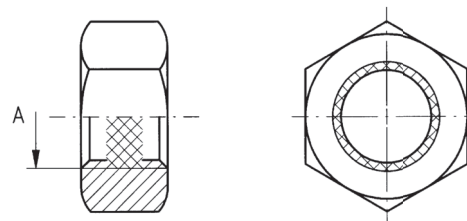
Application

For screw fastenings which are both vibration-resistant and capable of release at any time.

Versions

- patch coating
- 360° all round

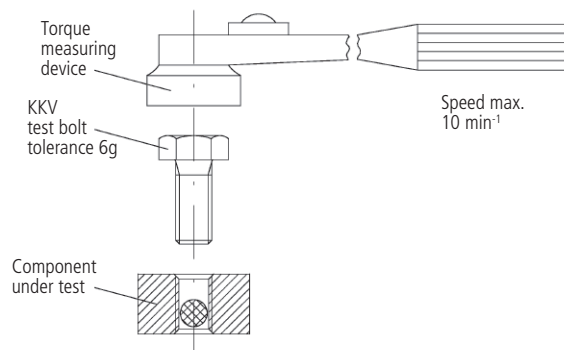
Coating to thread centre
(spray transition at the thread start and end)



Torque values according to Works Standard

Dimensions in mm

Thread nut	Clamping torque		
	First screwing on max.	First unscrewing min.	Fifth unscrewing min.
A			
M 5	1,6	0,29	0,2
M 6	3	0,45	0,3
M 8	6	0,85	0,6
M 10	10,5	1,5	1
M 12	15,5	2,3	1,6
M 14	24	3,1	2,3
M 16	32	4,5	3



Suitable for all metallic materials, also for threaded parts made of stainless steel, light alloys and brass as well as for almost all surface-treated parts.

Torque testing

1. A KKV test bolt is used for testing.
2. Screw the KKV test bolt into the component under test until the coating is completely covered. The test bolt may project beyond the coating by no more than 1 – 2 turns. When turning, measure the maximum screw-in torque (see factory standard table).
3. Screw the test bolt back out by 90°, then during the following 360° measure the greatest screw-out torque (for target values, see the factory standard table).
4. Screw the bolt out of the component under test four times and screw back in. During the fifth screw-out process, measure the greatest torque again during the first 360° turn (target values in accordance with the factory standard table).

The values shown in the table require nuts which are homogenous in terms of material and surface quality.

Thread as per DIN 13

Resistance See TufLok®-Works Standard 900.1

Locking similarly DIN EN ISO 2320

Other dimensions and special coatings (torque levels) on request.

Special versions

Deviating coating lengths, spot or all-round coating and/or other coating positions.
Deviating torque levels and values for different test methods (similarly DIN EN ISO 2320)
or other nut tolerances: Test coating required.

Alongside the standard colours blue for TufLok® and orange for Nytemp®, other colours can be supplied on request for purposes of differentiation (e.g. inch/metric, different strength classes and for identifying).