

**Document title** Notes on self-locking nuts and bolts

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**Model** all

**Modification notes**

27.10.2016	<p>Screws/bolts for threaded connections with self-locking nuts (B) must only be replaced if they are damaged. Microencapsulated bolts and nuts (C) must not be tightened again after curing. As curing already starts shortly after assembly, threaded connections with microencapsulated bolts and nuts (C) that are manufactured according to the tightening-angle-controlled tightening procedure must be tightened without delay at the post-tension angle.</p> <p>In case of some of the microencapsulated bolts and nuts (C), recutting of the thread for through-holes may also be specified. In such instances, we reserve the right to incorporate a specific reference hereto in the relevant area of the repair instructions.</p>		
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- A Bolt and nut with locking splines
- B Self-locking nuts
- C Microencapsulated bolt and nut
- D Bolt and nut with polyamide coating (Tuflok®)



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**General notes**

ⓘ Bolts and nuts with locking splines (A), self-locking nuts (B) and microencapsulated bolts and nuts (C) must always be replaced after they have been used once. Furthermore, the screws/bolts on threaded connections with self-locking nuts (B) must be checked for damage and replaced if necessary.

Otherwise, if this is not observed, external influences may lead to unwanted loosening or unfastening of a bolted connection.

ⓘ No greases, oils, waxes or other lubricants may come into contact with or be applied to bolted connections and their contact surfaces. Otherwise, the preload forces for the bolted connection no longer meet the specifications.

**Bolts and nuts with locking splines (A)**

When tightened, the teeth on the bolts and nuts with locking splines (A) work their way into the material of the component to be fastened, whereby a positive connection is made and the bolted connection is then secured against working its way loose.

ⓘ If several components are bolted to each other using bolts and nuts with locking splines (A), care should be taken to ensure that both the bolt and the nut have a locking spline.

Otherwise the bolted connection may work its way loose again.

ⓘ Due to the fact that, when tightening, any corrosion protection that has been applied may be damaged, bolted connects in the splash zone must be sprayed with spray wax **after** tightening.

On self-locking nuts (B) with a vinyl ring, the frictional connection is achieved through the vinyl ring being elastically deformed when screwed on to a pin or a bolt.

ⓘ The elastic deformation when tightening or plastic deformation of the vinyl ring when being unfastened wears out the nut after it is used once thereby removing its ability to secure properly. This is why self-locking nuts (B) must always be replaced after having been used once.

**Microencapsulated bolts and nuts (C)**

Microencapsulated bolts and nuts (C) can be recognized by the fact that they are coated all the way round with a colored adhesive. The microcapsules cause the surface of the coating to appear very pale and slightly porous. When screwing into the thread the microcapsules are destroyed by pressure or shearing loads. The adhesive and hardener contained in the microcapsules are thereby released and mixed up. This results in a chemical reaction, whereby the adhesive hardens and an integral joint is then made. A sealing affect is also achieved.

ⓘ Microencapsulated bolts and nuts (C) must not be tightened again after curing. As curing already starts shortly after assembly, threaded connections that are manufactured according to the tightening-angle-controlled tightening procedure must be tightened without delay at the post-tension angle. Otherwise the retightening or further tightening will destroy the

### **Self-locking nuts (B)**

Self-locking nuts (B) can be made of all-metal or using an integrated vinyl ring made of PA or they may contain another material.

Self-locking nuts (B) made of all-metal are used, in particular, in areas in which high temperatures prevail. The frictional connection is created by the elastic restraightening of the collar, which has a slightly oval shape.

threadlock rendering it ineffective.

**i** When unfastening microencapsulated bolts and nuts (C), there is a greater risk of injury due to the sudden breakaway torque.

On blind holes the thread has to be recut to ensure that all the residue from the previous thread locking compound is removed, before screwing-in new microencapsulated bolts.

In isolated cases, recutting of the thread for through-holes may also be specified. In such instances, we reserve the right to incorporate a specific reference hereto in the relevant area of the repair instructions.

### **Bolts and nuts with polyamide coating (D)**

Bolts and nuts with a polyamide coating (D) usually have a spot coating made of polyamide. There are however also versions with an all-round coating. These provide not only a locking affect, but also a sealing function.

The polyamide coating is usually blue. When screwed into a thread it creates a clamping affect, because the axial play between the bolt and nut thread is filled out by the polyamide, which in turn creates a solidly tightened threadlock.

**i** Bolts and nuts that have a polyamide coating (D) can generally be unscrewed without leaving any residue, so that any recutting of the mating thread is not required.

Apart from this, bolts and nuts with a polyamide coating (D) can be used several times without the locking function being impaired.

In isolated cases it may be specified that bolts and nuts with a polyamide coating (D) must be replaced after having been used once. In such instances, we reserve the right to incorporate a specific reference hereto in the relevant area of the repair instructions.