

The Nord-Lock Group

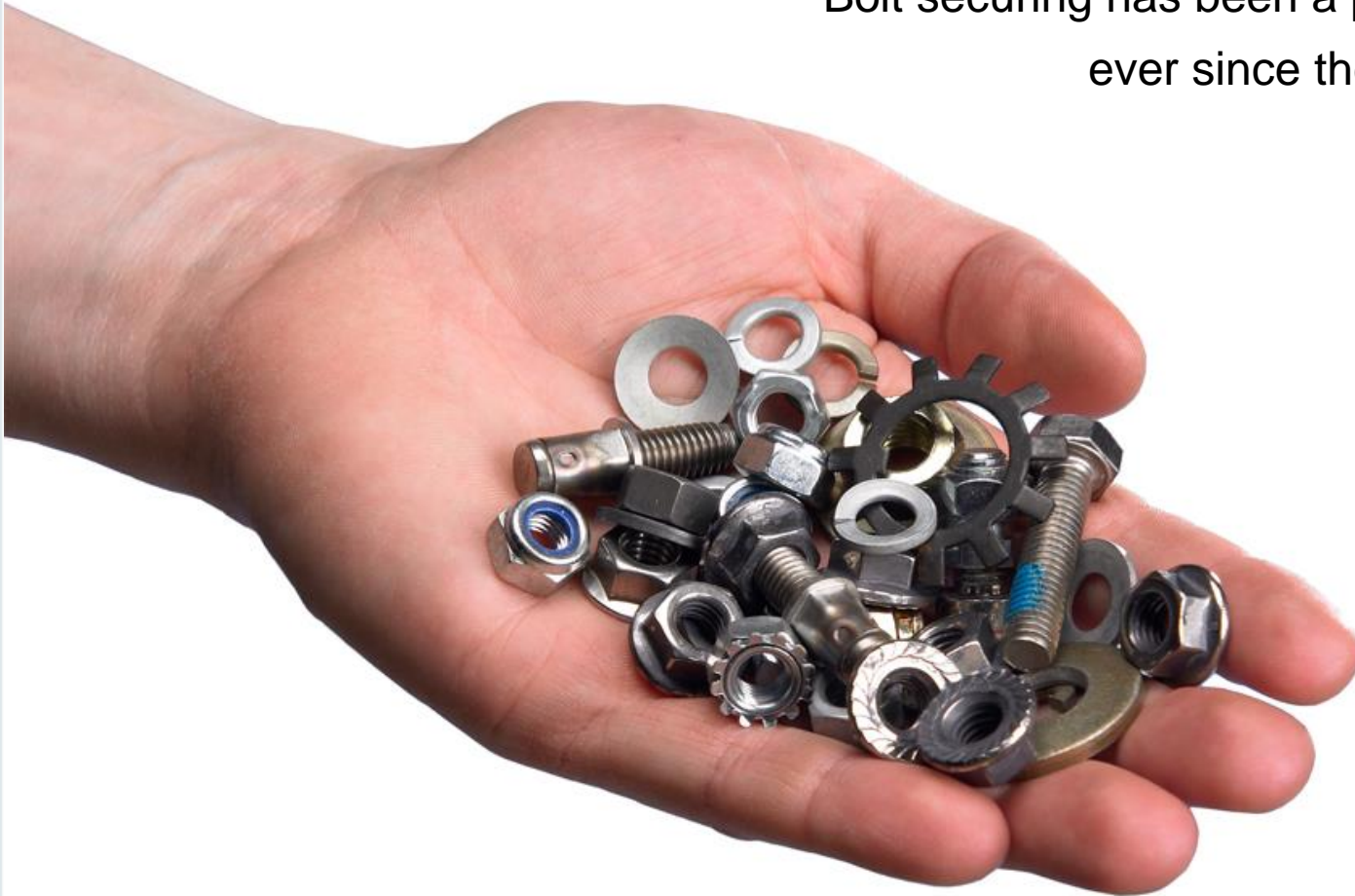
Nord-Lock original washers



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Business Development, Projects

The challenge

Bolt securing has been a problem
ever since the bolt was invented!





The solution

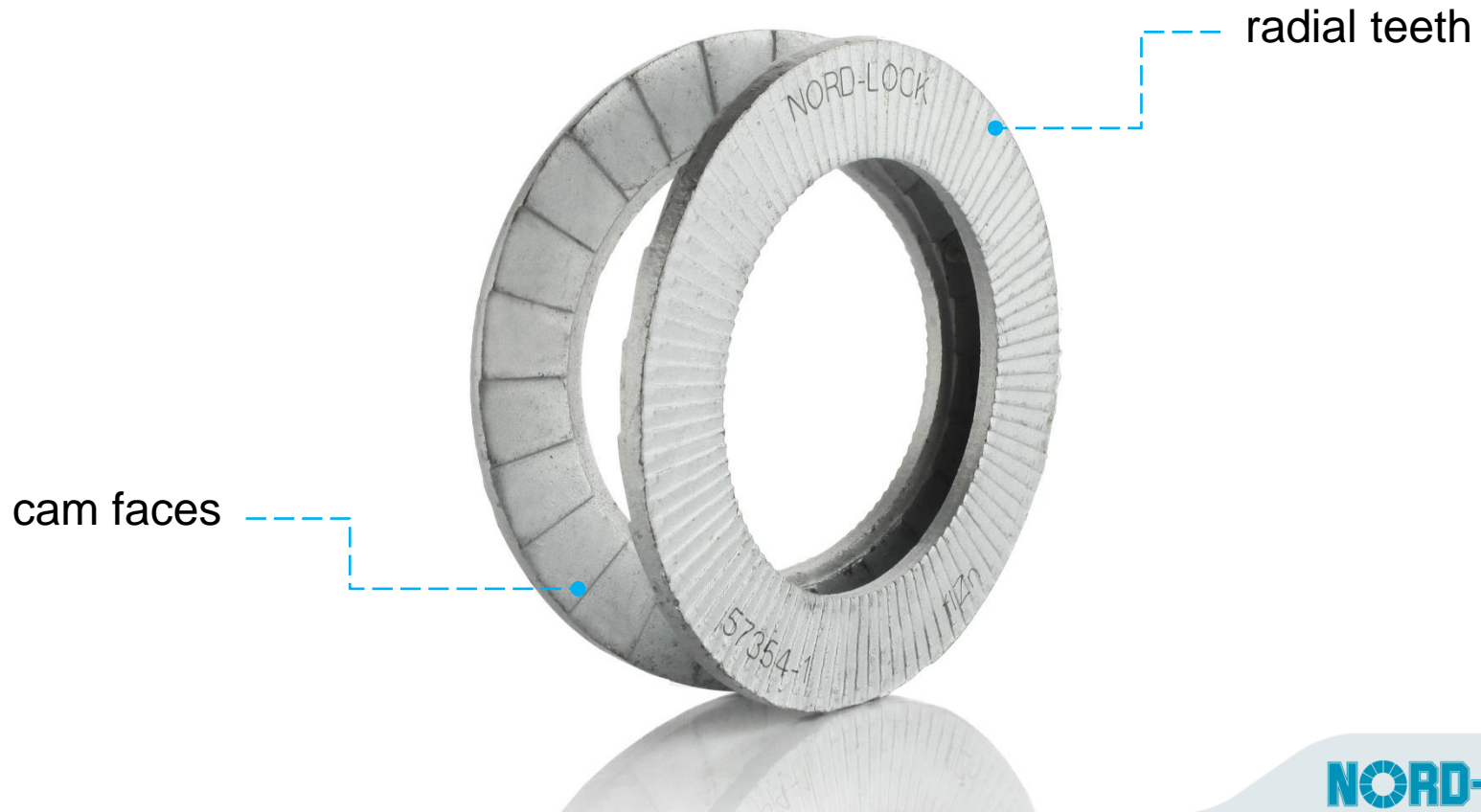


The Nord-Lock wedge-locking technology is designed to secure fasteners in extreme conditions and prevent bolt loosening.

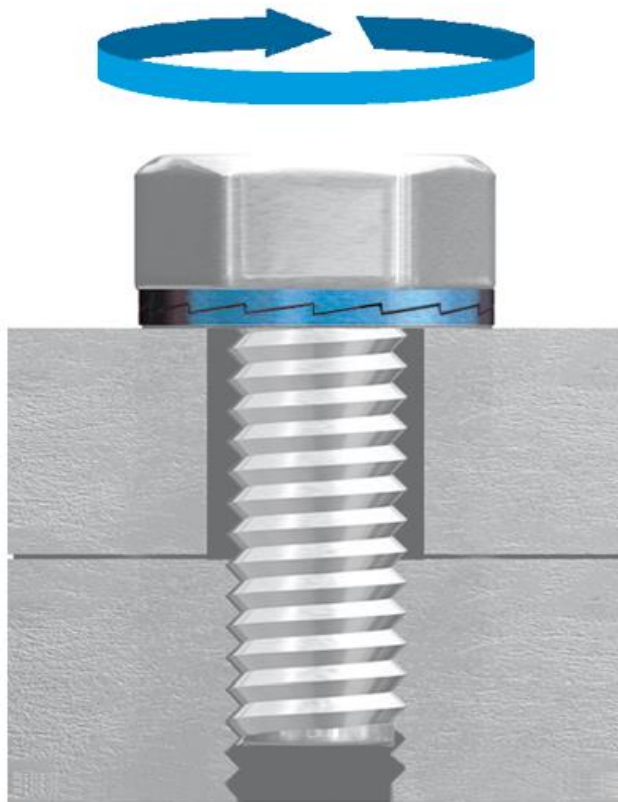
The Nord-Lock original washers

Nord-Lock washers secure bolted joints with tension instead of friction.

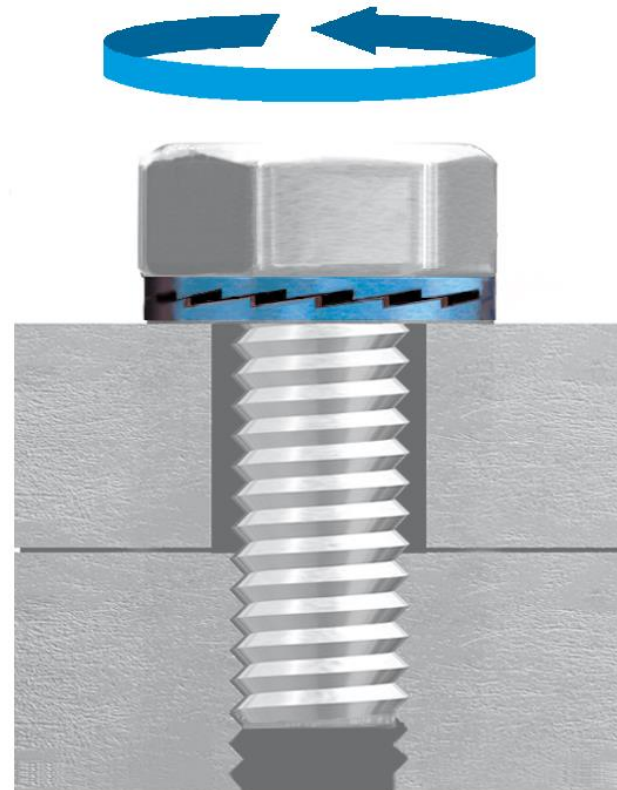
The system is a pair of washers that have cams on one side, and radial teeth on the opposite side.



Tightening & Untightening

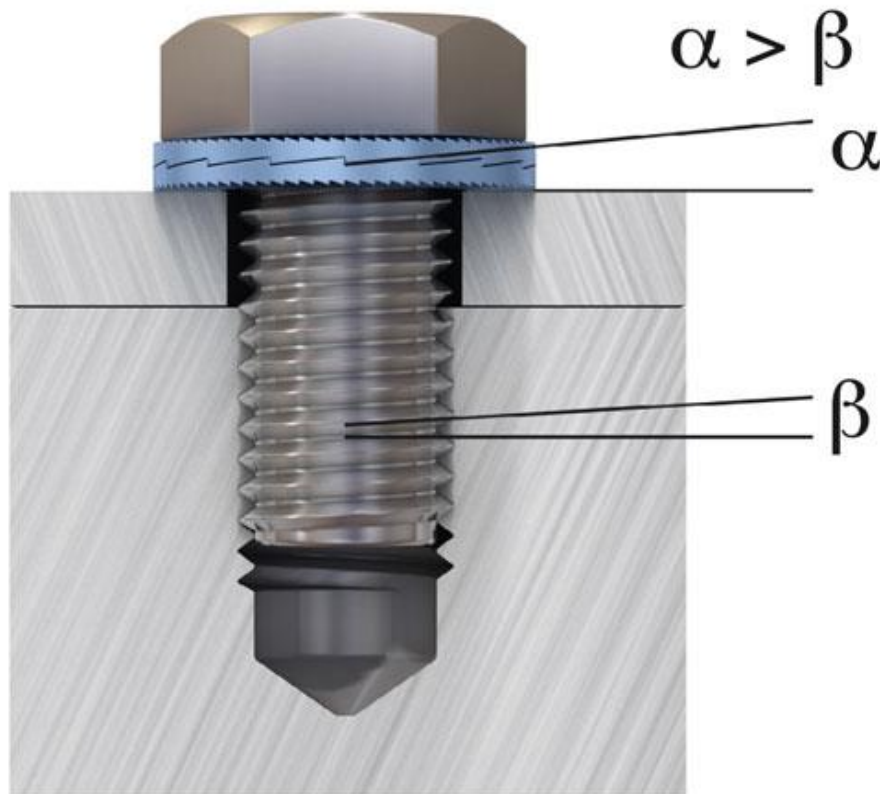


Sliding occurs between the upper washer and the bolt head / nut.



Sliding occurs between the washers.

The proven original wedge-locking solution



The key is the difference in angles. Since the cam angle α is larger than the thread pitch β a wedge effect is created by the cams, preventing the bolt from rotating loose.

This wedge locking principle positively locks the fastener in a joint which is subjected to extreme vibration or dynamic loads.

Eliminate unsafe fastening methods

Imagine if a bolt came loose on

- a construction site crane
- an amusement park roller coaster
- a bus wheel

Bolts are the crucial components that hold together products in our everyday life.

They need to withstand

- all types of weather
- extreme wear and tear
- incorrect installation

Over time, a bolted connection can become costly, time consuming, even dangerous.



Unsafe fastening can cause



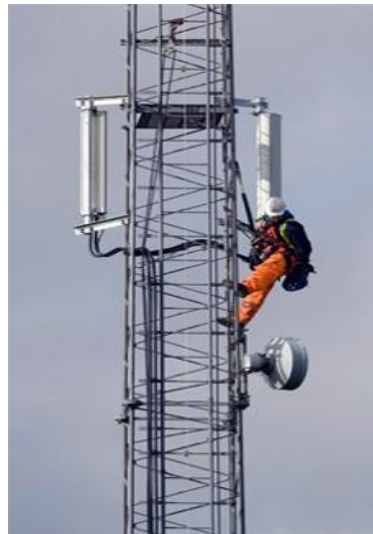
Loose bolts



Broken bolts



**Machinery
Downtime**



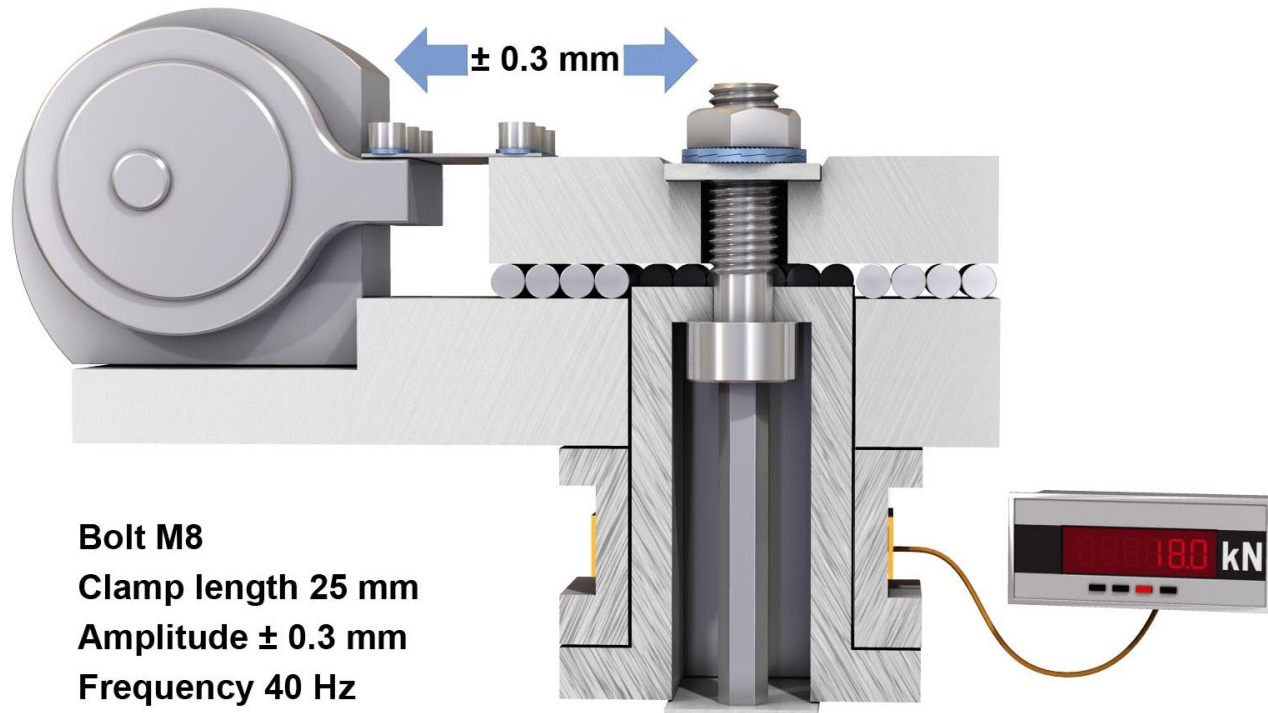
**Worker
Risk**



**Worker
Injury**

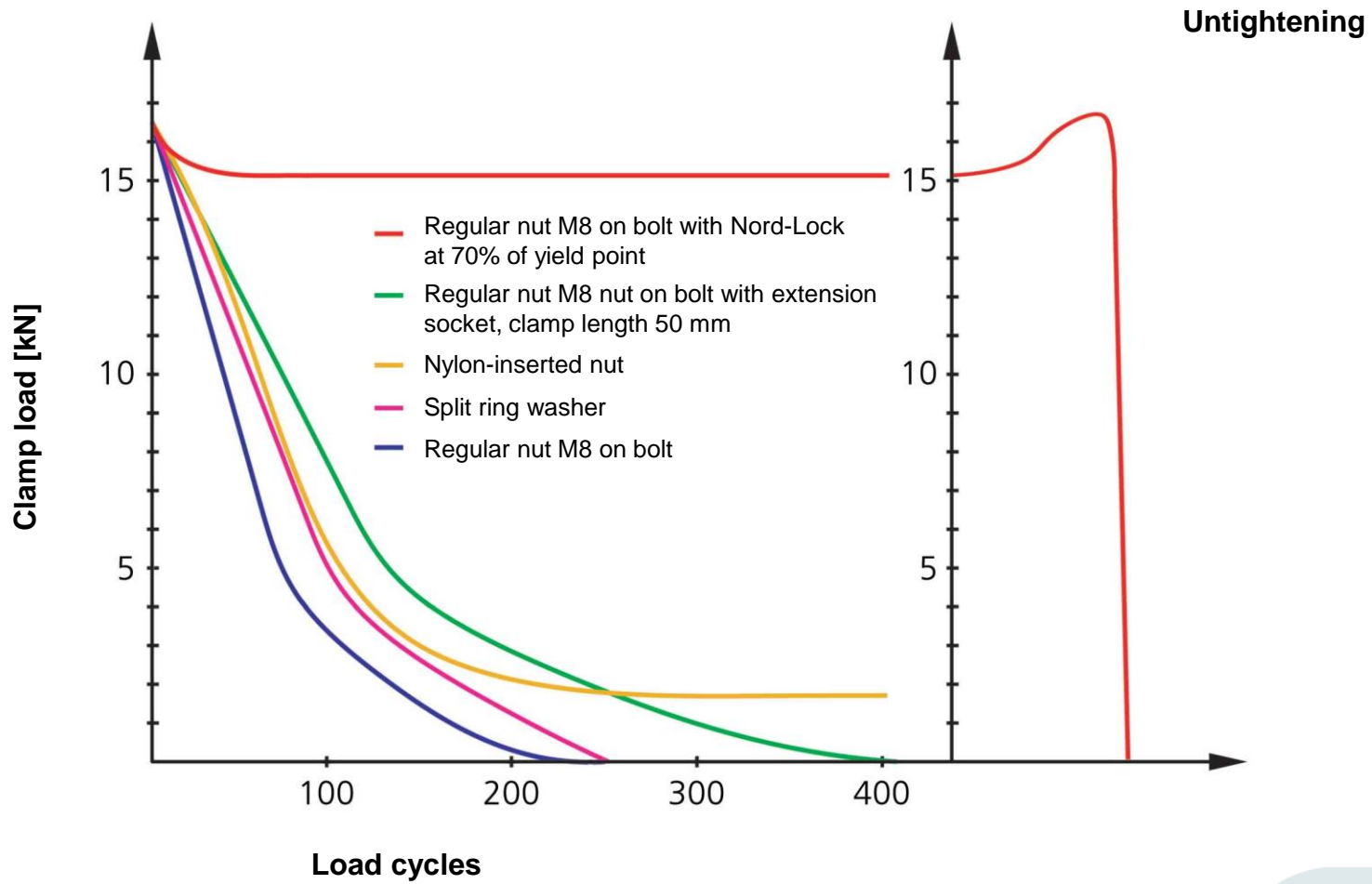
Proven in Junker vibration test

The Junker test according to DIN 65 151 is considered the most severe vibration test for bolted connections.

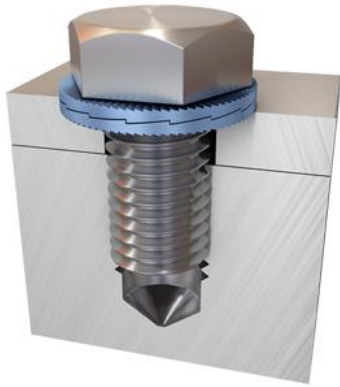


Vibration test

Bolt M8 (8.8) with clamp load length 25mm



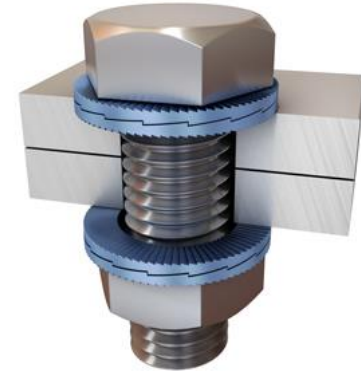
Joint guide



Tapped bolts



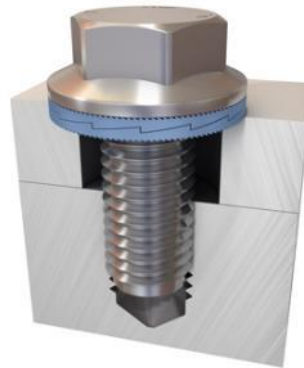
Counter bores



For through holes, use
two washer pairs



Stud bolts



Large / slotted holes
or soft underlying surfaces

Nord-Lock washers are not recommended

When the mating surfaces are:

- not locked in place
- harder than the washers
- very soft, like wood or plastic
- When the joint is non-preloaded
- When the joint is subject to extremely large settlements



Verifying correct locking function

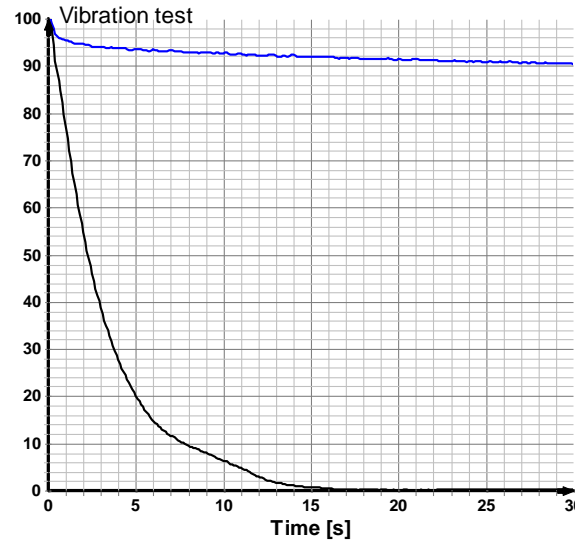
- Sliding must occur between the cam faces during untightening. A click-effect is generally felt when the cam faces override each other.
- Impression marks on bolt head/nut and mating surface.

Nord-Lock washers are designed to create impression marks without scoring the mating surface.



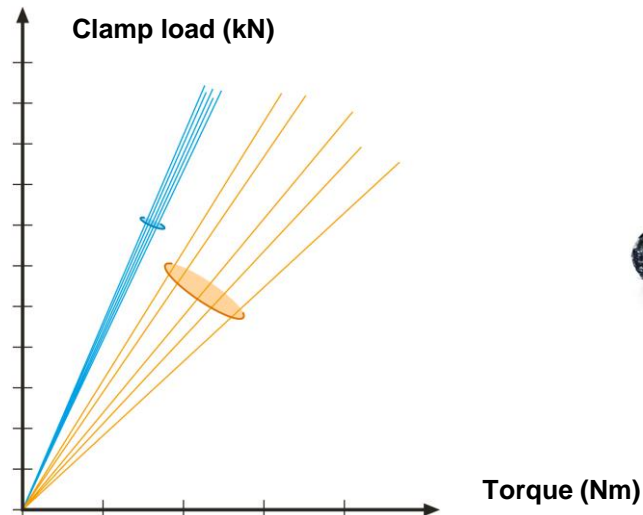
Features

No need to retighten



- M16 with Nord-Lock
- M16 with Plain washer

Possible to lubricate



Features



Wide product range

M3-M130 steel washers
M3-M80 stainless steel washers

Wide temperature range

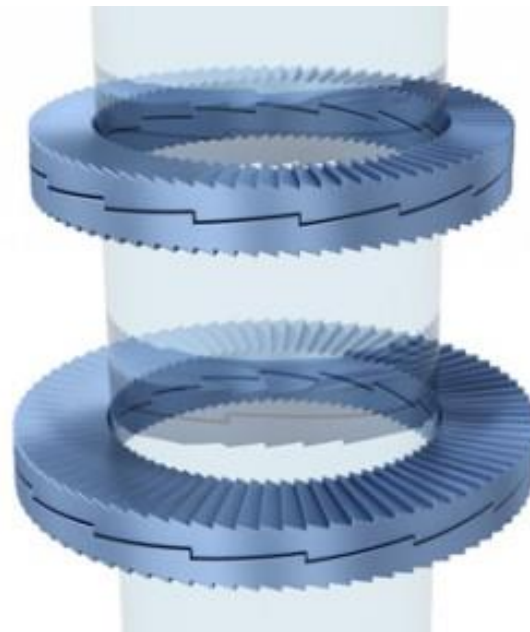
Corresponding to bolts / nuts of same quality
+ Special material for extreme temperatures

High corrosion resistance

Dörken's Delta Protekt® 600 hour min
+ Special material for corrosive environments

Washers with enlarged outer diameter (sp)

- Large / slotted holes
- Painted / sensitive surfaces
- Soft materials like fibre or aluminium
- Use together with flange bolts / nuts



Traceability & laser marking

- Washers are rigorously tested in all steps of production to verify that the quality requirements are met
- Each batch is assigned a control number which ensures full traceability and confirms that the product is a genuine Nord-Lock article

washer type	Code
Steel washers, Delta Protokt® coating	fIZn
Stainless steel washers	SS
254 SMO®	254
INCONEL® / HASTELLOY® C-276	276
INCONEL® 718	718



Proven and Certified



Eisenbahn-Bundesamt



Versuchsanstalt für Stahl, Holz und Steine
(Amtliche Materialprüfungsanstalt)
Universität Karlsruhe (TH)

THE BEST WARRANTY
YOU'LL LIKELY NEVER NEED



Benefits

- **Safely secure bolts**
- Prevent bolt loosening
- Quick and easy to install
- Possible to lubricate
- Reusable
- No retightening needed
- High corrosion resistance
- Wide temperature range
- Secures bolts at high and low preloads
- Fully traceable





Construction & Bridge Building



Forestry & Agriculture



Forging & Other Presses



Manufacturing & Processing



Railway



Mining & Quarry



Oil & Gas



Power Generation / Energy



Transportation



Shipbuilding & Marine

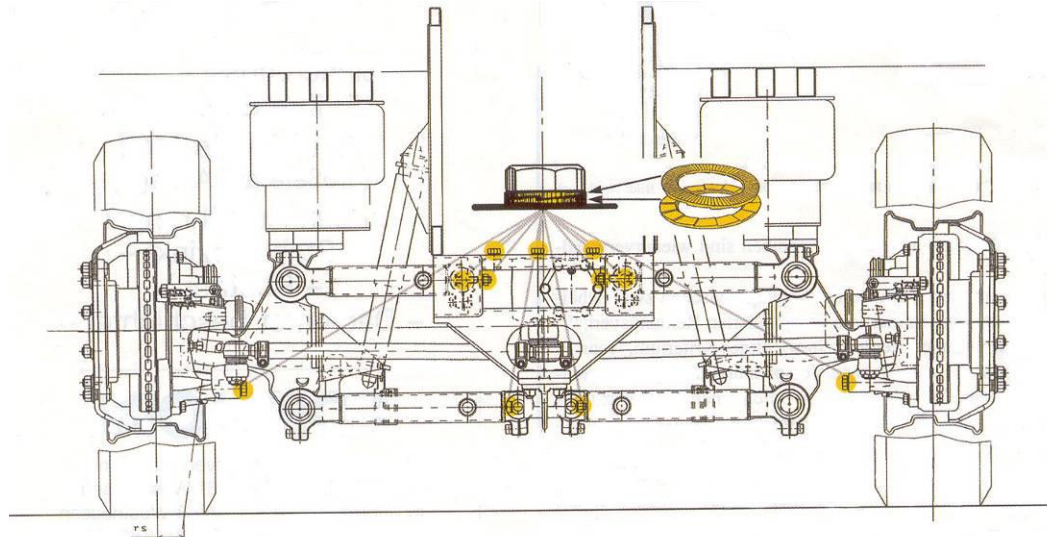


Steel



Machine Building

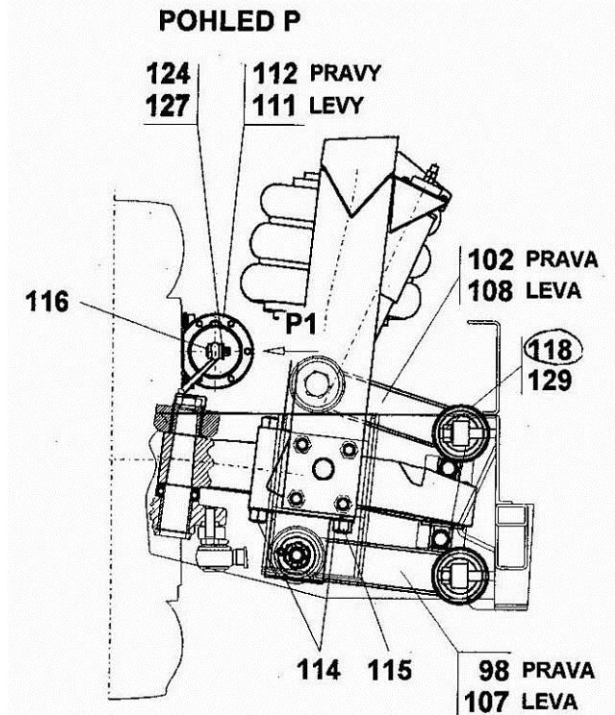
Neoplan wheel suspension system



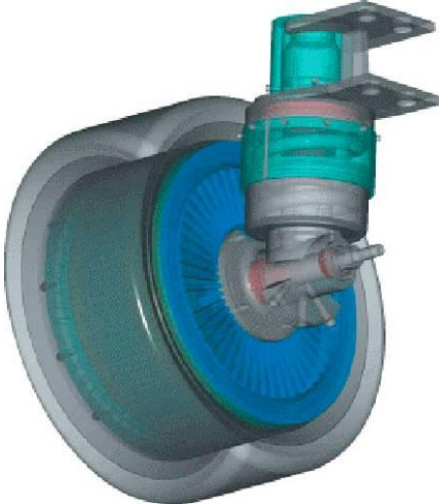
Optare Bus



SKODA Ostrov Bus



E-Traction duel-electric direct drive



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