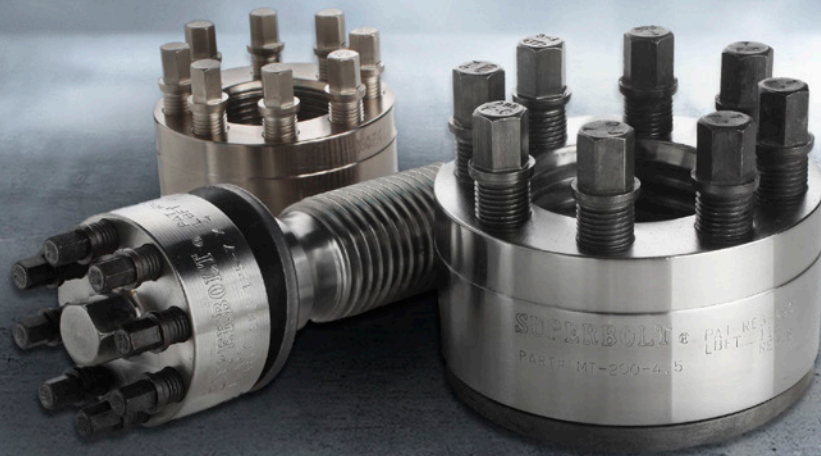


# SUPERBOLT MECHANICAL BOLT TENSIONING

TIGHTEN LARGE BOLTS USING EASILY MANAGEABLE TORQUES



# WHATEVER COMES ALONG WE HOLD IT TOGETHER

In a world of heavy industry, where large machines and equipment build and shape our world — details matter. No one should ever have to question the integrity of critical bolted connections.


Superbolt revolutionized the world of nuts and bolts in 1984 with the multi-jackbolt tensioner (MJT) and since then has proven its technology with multiple successful installations. Superbolt tensioners are easy to work with and provide a mechanical advantage with their unique design, which divides the load among multiple small jackbolts. Correctly installed, MJT connections are reliable, stay tight indefinitely and disassemble easily for planned maintenance. Even the largest MJTs are safe and can be installed or removed by a single worker with ordinary hand tools.

But the revolution hasn't stopped here. Superbolt continues to develop a multitude of solutions to solve the next generation of bolting challenges.

**WITH THE WIDEST RANGE OF MECHANICAL TENSIONERS  
ON THE MARKET AND CONSTANT GROWING PORTFOLIO —  
SUPERBOLT HOLDS IT ALL TOGETHER.**





A large, complex industrial machine, a Pelton wheel, is being moved by several thick steel cables. The wheel is made of many curved, metallic segments. In the background, a worker in a blue uniform and white helmet is visible, working on the machine. The setting is a large industrial facility with high ceilings and concrete pillars.

This Pelton wheel is just one example where millions of MJTs are used globally to secure bolts on critical applications.

Our engineers go to work each day determined to take on the world's most difficult bolting challenges.

We are the first to offer a full life cycle warranty for Superbolt technology, enabling engineers to shape modern living in the decades to come.

**LIFETIME  
WARRANTY**

**NORD-LOCK  
GROUP**

**WE MAKE ON-SITE BOLTING JOBS  
SAFER, FASTER AND MORE EFFICIENT.**



# THE SUPERBOLT PRINCIPLE



Superbolt tensioners are designed as direct replacements for conventional nuts and bolts. These devices can be threaded onto a new or existing bolt, stud, threaded rod or shaft. The main thread serves to position the tensioner on the bolt or stud against the hardened washer and the load-bearing surface.

Once it is positioned, actual tensioning of the bolt or stud is accomplished with simple hand tools by torquing the jackbolts which encircle the main thread. The jackbolts transfer the preload evenly into the main thread and, consequently, onto the joint. The main thread is tightened in pure tension.

## How it works

By tightening the jackbolts, a strong thrust (axial) force is generated. This thrust force is directed against a hardened washer.

Jackbolts have a small friction diameter and can therefore create a high thrust force with relatively little torque input.

The loads are transferred through the nut body which is positioned on the main thread by hand.

A hardened washer is used to transfer the force while protecting the flange face.

The thrust (axial) force of jackbolts and the opposite reaction force of the main bolt head create a strong clamping force on the flange.

The thrust (axial) force from the jackbolt creates an equally strong reaction force in the main bolt.



# BOLT TENSIONING MADE SIMPLE

Superbolt products meet the industry's highest standards. They are manufactured at our state-of-the-art facilities in Pittsburgh, Pa., USA, and St. Gallenkappel, Switzerland, where advanced CNC machining allows exceptional precision and quick turnaround. Most standard products are available off-the-shelf or within short lead times.

## Quality and environmental certification

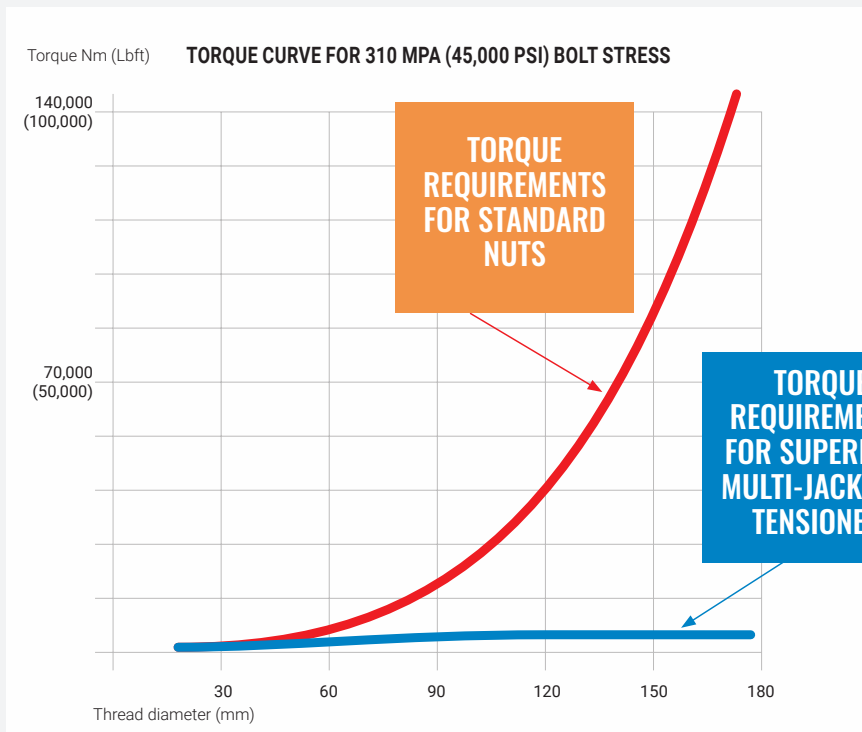
Quality control, including thread-gauging and measurement systems, are standard operating procedure, and every MJT is marked for traceability. We incorporate the latest technology and safety features into our designs.

## The industry's first full Lifetime Warranty

You can trust our products, which is why we introduced the industry's first full lifetime warranty. This guarantees that our Superbolt products will stay in place and fulfill their function for the entire lifetime of the bolted connection.

Our business has achieved various levels of certification including:

- DNVGL ISO 9001 : 2015
- QS ISO 9001 : 2015
- DNVGL Type Approval for MT & CY series



The chart shows how Superbolt tensioners remain easy to install, even on larger sizes, compared to standard hex nuts. Only hand tools are required to tighten any diameter stud/bolt.

# A FULL LIFESPAN OF ADVANTAGES

## WE WORK CLOSELY WITH YOU





# DESIGNED FOR YOUR BOLTING CHALLENGES

## SUPERBOLT SOLUTIONS GUIDE



### STUD BOLTS

Superbolt nut-style tensioners can be used on studs into blind-tapped holes. Tightening in pure tension means studs will not gall in the tapped hole and can be easily removed.

#### Products available

- MT, CY, GT, GTS
- Studs
- And more



### TAPPED HOLES

Superbolt bolt-style tensioners are often used into blind-tapped holes. MJT bolt heads are more compact and fit into tighter areas; additionally they reduce the number of parts.

#### Products available

- SB8 standard & SB12 high strength



### THROUGH-HOLES

A common application of double-ended studs use Superbolt nut-style tensioners and a reaction nut (Flexnut) on the other end. Flexnuts add elasticity to the stud, increasing the fatigue life.

#### Products available

- MT, CY, GT, GTS
- Studs
- Flexnuts
- And more



### COUNTER BORES

Superbolt bolt-style tensioners can be provided to fit completely into small counterbores. An internal installation removal hex allows for easy turning into position.

#### Products available

- SSJX compact/low-profile bolt-style tensioners

# STANDARD NUT- AND BOLT-STYLE TENSIONERS

When it comes to standard nut- and bolt-style tensioners, Superbolt has got you covered for a myriad of applications across all industries. Available in a wide range of sizes (often from M16 through M160). Additionally, many of these tensioners are able to be specially designed and incorporate anti-corrosion protection.



## GT ISO 898-2 Class 8 Replacement High-strength Nut-style Tensioner

The GT mechanical tensioner is ideal for medium- to high-strength studs and bolts. It is suited for the toughest applications, enabling you to achieve high bolt loads safely and with ease. Compatible with 8.8, 10.9 or equivalent-grade studs and bolts.

**Applications** Mining equipment, presses, anchor bolts, gear boxes, compressors etc.



## GTS ISO 898-2 Class 10 Replacement Super High-strength Nut-style Tensioner

The GTS is similar to the GT but is designed for ISO 898-2 Class 10 Replacement for use on grades 10.9, 12.9 or equivalent studs and bolts.

**Applications** Mining equipment, presses, anchor bolts, gear boxes, split gears, wind turbines etc.



## MT Standard Nut-style Tensioner

The MT can be used for general mechanical applications; suited for high- and medium-strength bolts and studs; fits in the same space as heavy hex nuts and feature hex-head jackbolts.

**Applications** Mining equipment, presses, anchor bolts, pinion stands, crushers, engines, compressors etc.



## CY Standard High-strength Nut-style Tensioner

CY tensioners have superior capabilities due to inherent materials, making them well suited for extremely high-strength and – within limits – low-temperature applications. They fit in the same space as a heavy hex nut. They are easier to tighten and offer a higher degree of safety.

**Applications** Compressors & pumps, high-pressure flanges, crushers, pinion stands, gear reducers & gear boxes, presses, split gears etc. within limits, for semi-cryogenic bolting.

Size range	M16-M160	3/4"-6"
Approx. bolt stress depending on size	400 to 1000 N/mm <sup>2</sup> 60 to 145 ksi	
Temperature range	-40 to 250 °C -50 to 500 °F	Lower temp. on request

Size range	M16-M100	3/4"-4"
Approx. bolt stress depending on size	400 to 1200 N/mm <sup>2</sup> 60 to 175 ksi	
Temperature range	-40 to 250 °C -50 to 500 °F	Lower temp. on request

Size range	M16-M160	3/4"-6"
Approx. bolt stress depending on size	400 to 750 N/mm <sup>2</sup> 60 to 100 ksi	
Temperature range	-40 to 250 °C 0 to 500 °F	

Size range	M16-M160	3/4"-6"
Approx. bolt stress depending on size	400 to 1000 N/mm <sup>2</sup> 60 to 145 ksi	
Temperature range	-40 to 250 °C -50 to 500 °F	Lower temp. on request



## H650 Medium-temperature, Nut-style Tensioner

The H650 can replace standard hex nuts at temperatures up to 350 °C (650 °F). Preload and torque values are based on a bolt stress of 310 MPa (45,000 psi), the value most commonly used by pressure-vessel designers. Depending on operating temperature, jackbolt torque and preload may be increased.

**Applications** Boiler feed pumps, boiler circulating pumps, reactors, heat exchangers, valves etc.



## H650T Medium-temperature, Tall Nut-style Tensioner

The H650T is ideal for use where space is limited and can replace most acorn and castle nuts at 350 °C (650 °F) for tight spaces. Preload and torque values are based on a bolt stress of 310 MPa (45,000 psi).

**Applications** Split lines on: turbines, engines, pumps, compressors etc.



## SB8 Standard Bolt-style Tensioners

SB8 bolt-style tensioners replace standard large diameter hex-bolts. They provide multi-jackbolt features for applications with tapped holes, or where threading a stud into a nut would be impractical. The outside diameter is smaller than that of a nut-type tensioner on a stud, allowing them to fit tighter areas with an external hex for installation and removal.

**Applications** Gear boxes, mining equipment, pinion stands, clamp-type flange connections, propeller blades, hydraulic cylinders etc.



## SB12 High-strength Bolt-style Tensioners

The SB12 bolt-style tensioners are similar to the SB8 but offer higher strength than the standard range.

**Applications** Gear boxes, mining equipment, pinion stands, clamp-type flange connections, propeller blades, hydraulic cylinders, testing equipment.

Size range	M20-M125	3/4"-5"
Approx. bolt stress depending on size	310 N/mm <sup>2</sup> 45 ksi	Based on stress area AS
Temperature range	-10 to 350 °C -50 to 650 °F	

Size range	M24-M100	1"-4"
Approx. bolt stress depending on size	310 N/mm <sup>2</sup> 45 ksi	Based on stress area AS
Temperature range	-10 to 350 °C -50 to 650 °F	

Size range	M16-M160	3/4"-6"
Approx. bolt stress depending on size	350 to 650 N/mm <sup>2</sup> 50 to 95 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

Size range	M20-M90	3/4"-3-1/2"
Approx. bolt stress depending on size	550 to 850 N/mm <sup>2</sup> 80 to 125 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	Lower temp. on request



# COMPACT/ LOW-PROFILE TENSIONERS

Height restrictions in applications make it difficult to preload joints adequately. That's why Superbolt developed our range of low-profile tensioners, bringing all the advantages of a traditional MJT in a compact design.



## **SJ** Standard Low-profile Jamnut Tensioner

SJ tensioners are used for applications involving limited headroom or thread engagement. They offer the advantages of MJTs: simple tightening and loosening, and high safety against loss of pre-tension.

**Applications** Hydraulic cylinders, shaft mounts, piston connections etc.



## **SJX2** High-strength Low-profile Jamnut Tensioner

SJX2 tensioners are used for applications where a high pre-load is required. They can replace normal quality 8 hex nuts while requiring less space. Due to the MJT system they are much easier to tighten and there is less risk against loss of pre-tension.

**Applications** Hydraulic cylinders, shaft mounts, piston connections, foundations etc.



## **NM2/NI2** Bearing Locknut Tensioner

NM2/NI2 tensioners are interchangeable with standard DIN 981 and KM locknuts. Ideal for jacking bearings into place. They can also clamp whole shaft assemblies. In addition to standard locknuts, the NM2/NI2 provides a true pre-load, reducing the risk of failure. They are designed to match the bearing loads of the respective bearing sizes.

**Applications** Common bearings.



## **SMX2** Mill Motor Nuts Tensioner

SMX2 tensioners replace the standard mill motor armature nuts supplied by motor OEMs. SMX2 tensioners are available for most standard motor frame sizes. Their preloads match the hub stress capacities of brake wheels and pulleys.

**Applications** Secure brake wheels, couplings, and pulleys to mill motor armature shafts.

Size range	M20-M160	3/4"-6"
Approx. bolt stress depending on size	100 to 450 N/mm <sup>2</sup> 15 to 65 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

Size range	M20-M160	3/4"-6"
Approx. bolt stress depending on size	300 to 650 N/mm <sup>2</sup> 45 to 95 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

Size range	M30-M160	1"-6-1/4"
Approx. bolt stress depending on size	20 to 90 N/mm <sup>2</sup> 3 to 15 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

Size range	M30-M160	1"-4"
Approx. bolt stress depending on size	100 to 250 N/mm <sup>2</sup> 15 to 35 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	



## **SSJX2** Compact/Low-profile Bolt-style Tensioners

SSJX2 bolt-style tensioners offer multi-jackbolt features that match the countersink dimensions of standard socket-head cap screws which are difficult to tighten. In spite of limited pre-load capacity they offer high safety against loss of pre-tension due to their multi-jackbolt design. Moly-lubricated set screws are included.

**Applications** Gear boxes, BOF applications, mining equipment, pinion stands, clamp-type flange connections, wind tunnels, machine tools, presses etc.

Size range	M20-M100	3/4"-4"
Approx. bolt stress depending on size	350 to 800 N/mm <sup>2</sup> 50 to 115 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

# TENSIONERS FOR DYNAMIC APPLICATIONS

Generating correct preload forces for compressors and rotating equipment can be especially demanding. Superbolt tensioners for dynamic applications incorporate an added safety design feature – captive machinery-style jackbolts. Gain a competitive advantage with CN Series cross-head jamnuts for reciprocating compressor crossheads: requiring only simple hand tools and featuring an easy-to-follow installation procedure.



## MR Captive Jackbolt Tensioner for Dynamic Applications

MR tensioners meet the special requirements for high-speed rotating machinery. The jackbolts are captively mounted, eliminating accidents from catapulted parts.

**Applications** Bolted joints on high-speed machinery such as couplings, motors, turbines etc.



## MRA Armored Captive Jackbolt Tensioners

MRA tensioners have recessed jackbolts into the nut body to protect them mechanically from damage and to reduce noise. The jackbolts are captively mounted within the tensioner body to stop them from becoming free and causing damage. They are armored for harsh environments to meet the special requirements for high-speed rotating machinery.

**Applications** Bolted joints on high-speed machinery such as couplings, motors, turbines etc.



## CN Compressor Crosshead Jamnuts

CN reciprocating compressor crosshead jamnuts are safe and easy to install or remove. Designed in collaboration with a major compressor manufacturer, they incorporate Superbolt captive jackbolts as an added safety feature. An extra-wide bolt circle positions jackbolts away from the piston rod for better wrench clearance.



## SP Compressor Piston-end Nuts

Custom-designed, nut-style tensioners are ideal for compressor pistons to piston rods. No need to clamp the rod when installing or removing piston-end nuts, which incorporate captive jackbolts as an added safety feature. Specially designed to match counterbore dimensions of the piston-end nuts they replace.

Size range	M16-M125	3/4"-5"
Approx. bolt stress depending on size	300 to 550 N/mm <sup>2</sup> 45 to 80 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

Size range	M20-M125	3/4"-5"
Approx. bolt stress depending on size	350 to 650 N/mm <sup>2</sup> 50 to 95 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

Size range	M36-M160	1-1/2"-6"
Approx. bolt stress depending on size	210 N/mm <sup>2</sup> 30 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

Size range	M36-M160	1-1/2"-6"
Approx. bolt stress depending on size	210 N/mm <sup>2</sup> 30 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

# REACTIVE SIDE SOLUTIONS



## SX8 Standard Flexnuts

SX8 Flexnuts are suited for use with SB8 bolt-style tensioners or in conjunction with through-studs and MT nut-style tensioners.

**Applications** Gasketed flanges, mining equipment, split gears presses, test equipment.



## SX12 High-strength Flexnuts

SX12 Flexnuts are suited for use with SB12 bolt-style tensioners or in conjunction with through-studs and CY nut-style tensioners.

**Applications** Gasketed flanges, mining equipment, split gears presses, test equipment.

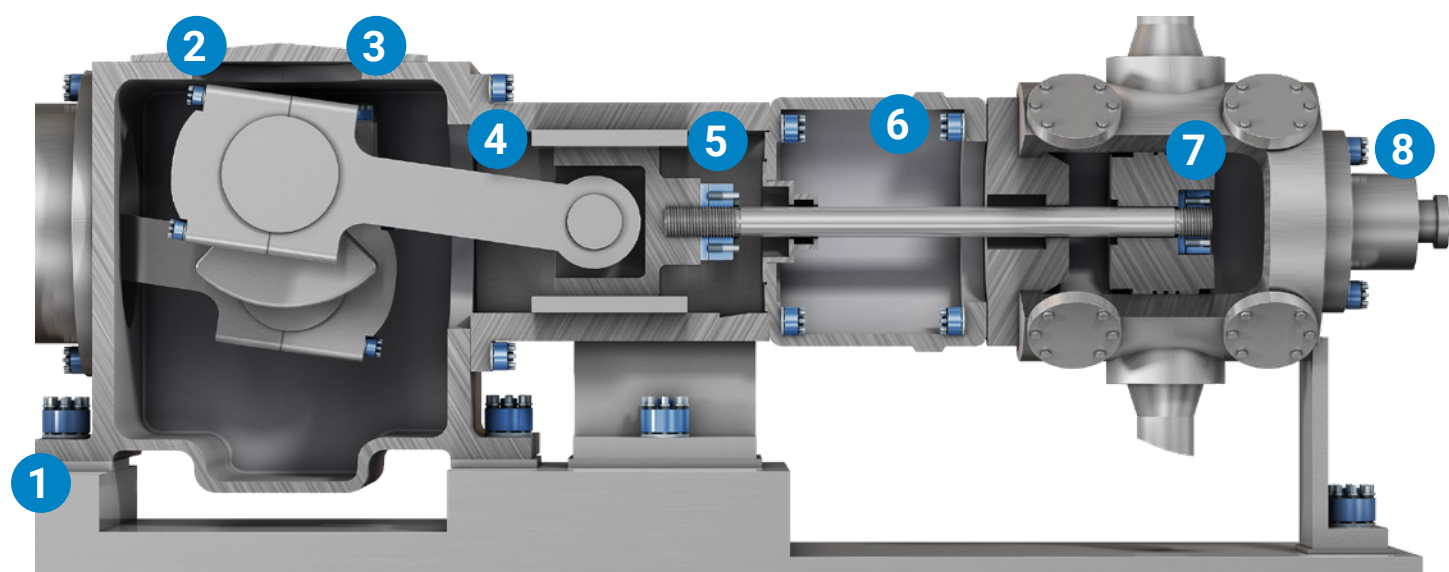
Size range	M20-M160	3/4"-6"
Approx. bolt stress depending on size	400 to 750 N/mm <sup>2</sup> 60 to 100 ksi	
Temperature range	-10 to 250 °C 0 to 500 °F	

Size range	M20-M160	3/4"-6"
Approx. bolt stress depending on size	400 to 1000 N/mm <sup>2</sup> 60 to 145 ksi	
Temperature range	-40 to 250 °C -50 to 500 °F	Lower temp. on request

SX8 and SX12 Flexnuts are able to flex elastically. Under load, Flexnuts flex out at the bottom and in at the top. This helps relieve stress concentration in the main thread and increases the fatigue life of the bolt. Flexnuts are used for applications where bolt fatigue is a concern or failures have occurred due to fatigue. They are also great for gasketed joints where temperature fluctuations and leakages occur. Flexnuts are reactive nuts, designed to be applied opposite Superbolt tensioners. They are never torqued directly to achieve preload.



# BOLT-INTENSIVE COMPRESSORS



- |                     |                    |                 |                      |                              |                   |                           |                                   |
|---------------------|--------------------|-----------------|----------------------|------------------------------|-------------------|---------------------------|-----------------------------------|
| 1. Foundation Bolts | 2. Connecting Rods | 3. Main Bearing | 4. Crosshead Housing | 5. CN Tensioner on Crosshead | 6. Distance Piece | 7. SP Tensioner on Piston | 8. MT Tensioner on Cylinder Heads |
|---------------------|--------------------|-----------------|----------------------|------------------------------|-------------------|---------------------------|-----------------------------------|

## ACCESSORIES AND CONSUMABLES

The wrong parts, tools, and materials can reduce the function of Superbolt tensioners or cause direct and indirect damage. You can protect your investment in safe bolted connections by using high-quality, Superbolt-recommended accessories and consumables.



### Protective Caps – PVC

PVC protective plastic caps protect tensioners from environmental influences like dust, humidity, etc. They fit snugly over the outside diameter and are available for most sizes up to M160. If filled with grease, even greater protection is possible over a longer time. When used under dynamic conditions, we suggest securing the caps with cable ties or hose clamps. The caps can be used at limited temperatures on almost all Superbolt Tensioners.



### Protective Caps – Stainless Steel (available on request)

Stainless steel protective caps protect tensioners from damage in hostile environmental situations such as dust, humidity etc. as well as protection against physical damage. The restraining strap is firstly located between the washer and the tensioner body. The loose fitting cap is then placed over the tensioner and secured by means of the top bolt. For dynamic applications we suggest additional measures.

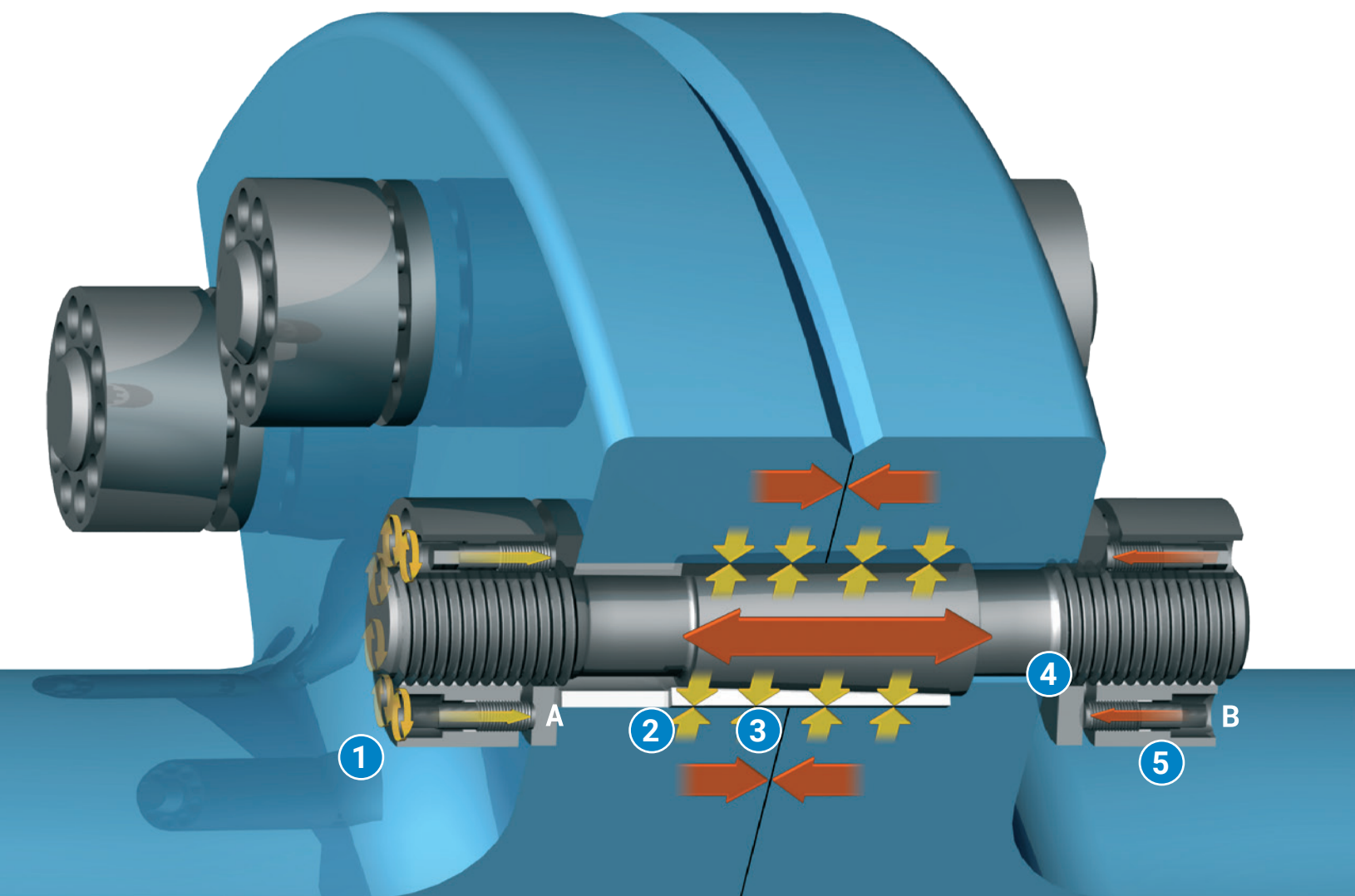


### Sockets and Torque Wrenches

Heavy sockets as used on power tools are best suited for tightening Superbolt jackbolts. As a service for our customers, a selection of such sockets are available. Designed to suit the application, they offer both high safety and long life.

### Available upon request

- Lubricants
- Special sockets
- Extensions
- Torque wrenches
- Power tools
- Torsion bars
- Pneumatic/electric wrenches



1. Tensioner "A" pulls the tapered stud into the expanding tapered sleeve which is split, thus generating a radial force.

2. The spacer centers the split tapered sleeve relative to the split line.

3. The split tapered sleeve creates a radial pre-load and transfers the external torque.

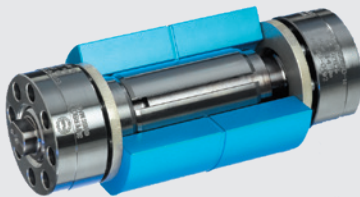
4. The tapered stud transfers the forces required for the radial and axial frictional contacts. At the same time, it offers an additional form closure when over-loaded.

5. Tensioner "B" pulls the coupling flanges together, thus generating an axial clamping force. It is also used in the removal process for easy removal of the assembly.

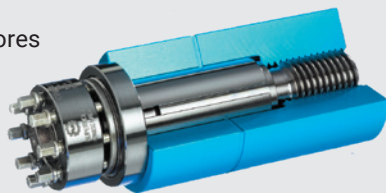


# EXPANSION BOLTS: SIMPLER, LOWER-COST BOLT REPLACEMENT

Expansion bolts are able to offer tremendous radial expansion and joint clamping force in one bolting system. Expansion bolts can replace traditional interference or force-fit bolts. The key to this solution is the split expansion sleeve that mates with the customer's machined holes. The split sleeve requires less tolerance on mating parts than is traditionally required with interference fit, saving critical machining time.

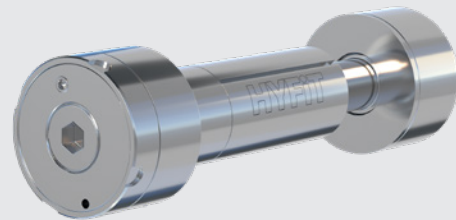


EBC – Through bores



EBB – Blind holes

EzFit expansion bolts are radially expanding, axially tensioned coupling bolts. Replacing traditional fitted bolts, which are difficult to install and dismantle, ease of installation and removal is guaranteed. Due to the radial pre-load, the joint experiences an increase in rigidity, therefore eliminating micro-movements on the split flange. EzFit are fully mechanical elements, easy to maintain and are totally re-usable.



HyFit – the hydraulically operated expansion bolt – has been designed to address safety concerns expressed by many current users of hydraulic coupling bolts. In addition to providing a solution for coupling maintenance where standard-type “fitted” bolts cause major outage delays, its application solves most large coupling bolt issues in a totally unique package. It can deliver high-performance torque transmission for critical-load rotating shafts and couplings. It's an advanced solution for every coupling that requires truly fitted bolts which will improve efficiency and reduce maintenance costs.

# LARGE DIAMETERS & HIGH PRELOAD

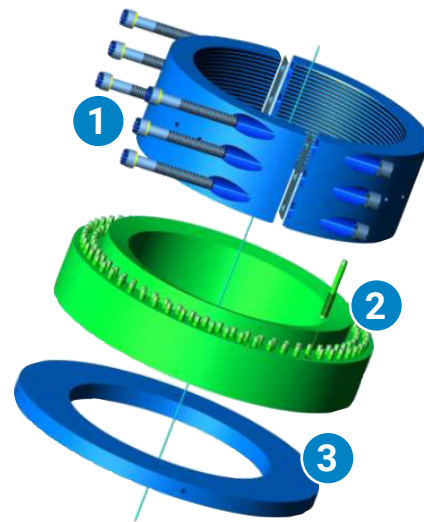
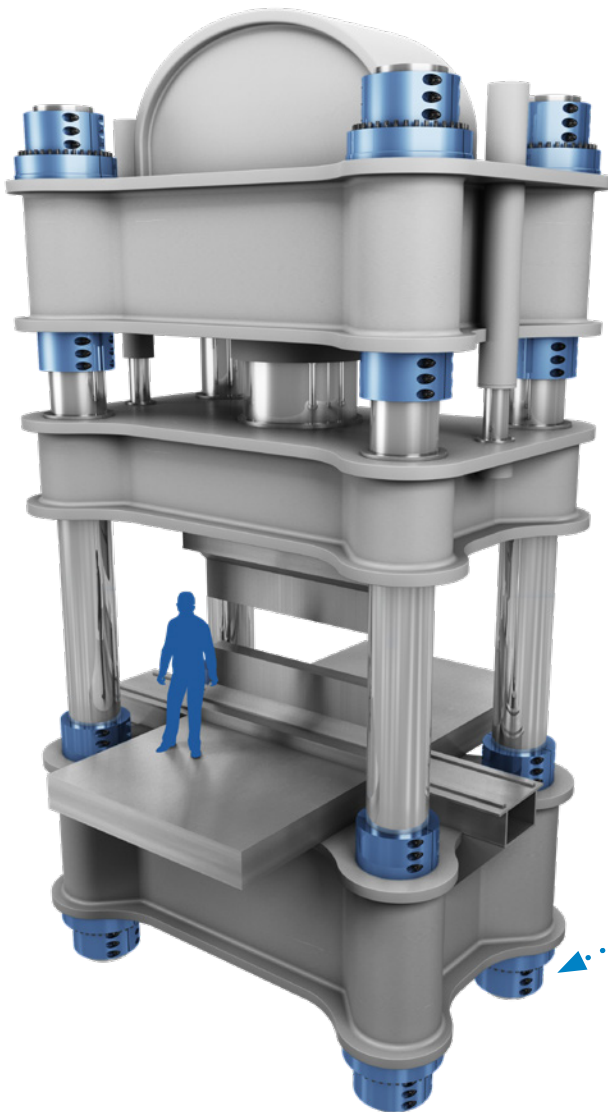
Other bolting methods are heavily challenged to solve the many bolting problems found in giant machines such as forging presses, cranes, or mining machines. All of these have large diameter nuts and bolts over M100 (4 inch) that require extremely high preloads.

Superbolt products allow you to achieve even the highest preloads. Thread diameters of 1.5 M (60 inch) and with clamp ranges up to 90 MN (20 Mlbf) have been produced.

## Superbolt STC

Innovative and easy to use Split-nut Thrust Collar (STC) tensioners are the perfect solution for large-sized threads and high preload requirement applications.

A threaded split nut (1) is positioned over a threadless ring (2). When tightened, the jackbolts – which are contained in the ring – push against a hardened washer (3) and cause the ring to thrust against the split nut, thereby preloading the joint. The installation is quicker and with less heavy turning equipment.





# THE SUPERBOLT TOOL WORK SMARTER. NOT HARDER.

## Multi-jackbolt Tightening Tool (MJTT)

The Superbolt Tool allows the user to tighten all the jackbolts on an MJT simultaneously, speeding up the tightening process considerably. This can benefit those who use a high number of MJTs and/or those who have frequent maintenance schedules, as the tool considerably reduces installation and removal times. It provides fast and accurate application of torque to multiple jackbolts; this maintains accurate bolt loading and provides even jackbolt load application.

The Superbolt Tool drive is supplied with an interchangeable cassette system for various tensioner sizes and functions which can be specially designed for a single application.

## Advantages

Fast tightening and untightening minimizes production and maintenance schedules

- Improved maintenance planning maximizes revenue
- Use of existing input tooling ensures quality assurance programs remain unaffected
- Increased safety as pinch points have been designed out
- Lightweight, modular equipment for easy handling

## Applications

Used on a wide array of applications where high quantities of MJTs of the same size or frequent maintenance is needed



## VERSATITE

### Two technologies in one system

Incorporating the strengths of both Superbolt mechanical and Boltight hydraulic tensioners, the groundbreaking new VersaTite Hydraulic Mechanical Tensioner allows you to attain the speed and uniformity of a hydraulic tensioner with the high load capability and accuracy of a mechanical tensioner. The design lets you accurately control the final preload mechanically by applying torque to a system of jackbolts. Removal method is up to you – mechanically or hydraulically.

# UNIQUE DESIGNS TO YOUR SPECIFICATION

## CUSTOMIZED SOLUTION EXAMPLES

When off-the-shelf parts just won't do the job, you can rely on the Superbolt Technical Center to design and manufacture exactly what you need. We respond fast to keep your downtime to a minimum and get your equipment back up and running safely, efficiently, and cost-effectively.

From our standard range, our pre-engineered range or customized solutions, we have the know-how to provide the right design for your application. The following are just a few examples of what we can do.



### OFFSHORE/ SUB-SEA

Superbolt offers a unique combination of features built into this specialized multi-jackbolt tensioner for offshore bolting applications.

#### It incorporates three key features:

1. The washer is captive to the nut body to prevent loss of the washer
2. Corrosion protection to address the harsh conditions
3. Integral flats on the nut for turning assistance on difficult stud threads



### TAMPER-PROOF TENSIONERS

Superbolt offers a tamper-resistant jackbolt design. The tamper-resistant jackbolts are a product improvement for Superbolt's MJT bolting system and are intended for use in security-sensitive applications. Tamper-resistant jackbolts are designed to protect MJTs from unwanted tightening and loosening. They utilize an abnormally shaped head set in a counter-bore hole, which requires a special tool attachment to torque or un-torque the jackbolts.



### EXTERNAL THREADED TENSIONERS (ETT)

An ETT is an externally threaded tensioner that provides a pushing force for loading or sealing a mating piece (compression member). Unlike conventional nut-style tensioners with an internal threaded portion and machined-surface outer diameter, an ETT has its threads machined onto the outer diameter. The ETT can be solid or hollow (i.e. bored center hole but unthreaded). The ETTs use multi-jackbolt technology to generate compression loads for assembly components in machinery. They are simply turned into position.

A large hex or some other provided turning tool is used to facilitate nut turn-down. The jackbolts, which are tightened to a prescribed torque with low-energy handheld tools, push directly against the loading piece. Strong compression or sealing forces are generated.

## HIGH- AND LOW-TEMPERATURE TENSIONERS

Extreme temperatures increase the complexity of bolting. Superbolt products are available in solutions to meet temperature ranges of -270 °C (-450 °F) to 600 °C (1150 °F). Due to the complexities of low- and high-temperature bolting, Superbolt offers a variety of solutions based on the temperatures and code requirements. Such cases are often found in power or petrochemical plants where extremely low temperatures (liquid hydrogen, fusion reactors, etc.) and extremely high temperatures (combustion chambers, turbines, steel mills, furnace equipment) exist.



## CUSTOMIZED STUDS

Although the majority of our business revolves around top-quality Superbolt tensioners, we also offer one-source shopping for your entire joint hardware. With our comprehensive threading know-how and extensive inventory of gauging equipment, Superbolt can offer customized studs to meet and deliver a complete bolted package. Why not choose a Superbolt nut-style tensioner, stud and flexnut kit?

Sizes from M16 to over M300 are possible and in a wide variety of materials. We have rolled thread capability and can handle many thread configurations and standards (ISO, DIN, ANSI, Whitworth, Acme, Trapezoidal, and Buttress).

# MATERIAL REQUIREMENTS, ENVIRONMENTAL & CORROSION PROTECTION

No matter the environment, Superbolt has plenty of product-enhancing options to keep things protected. From stainless steels to various coatings, we can meet your requirements in humid environments, offshore and salt water splash zones or chemical exposure. In addition to corrosion protection, coatings can be beneficial for various purposes, e.g., color-coding, durability and conductivity enhancement, as well as friction control.

## Material Requirements

Stainless materials adapted for the specific requirements

- Martensitic
- Austenitic
- Duplex
- Precipitation hardened
- Inconels & Monels

## Environmental & Corrosion Protection

Coatings and platings including

- Electroless nickel
- Xylan
- Zinc
- Black oxide
- Zinc flake

# TECHNICAL CENTER

## Technical centers and seminars

You are welcome to visit our offices and technical centers for a tour, or to attend seminars about bolted joints. For more information contact your local Superbolt representative.

## On-site training

We share our knowledge and experience of best bolting practices with your team.





# LST LOAD-SENSING TENSIONER

## The future of engineering is smart

As the global market leader of bolting solutions, Nord-Lock Group is dedicated to improving our already state-of-the-art products – including the integration of smart technologies. The Superbolt Load-Sensing Tensioner (LST) is among the first of these Industry 4.0 innovations, measuring the preload of a multi-jackbolt tensioner with an accuracy that is better than  $\pm 5\%$ ! The LST features a wealth of benefits without the need for any modification of the bolted joint.







# POWER GENERATION

When it comes to powering the future, Superbolt works hand-in-hand with all sectors of the power generation industry.

## Applications including

- Fossil: turbines, couplings, generators, boiler feed pump, circulating pump, stay rods, stop and throttle valves
- Nuclear: valves, heaters, manways, pumps, turbines, shaftline couplings
- Hydro: turbine-generator shaftline couplings, pelton nozzles, kaplan servo piston nuts, blade bolts
- Wind: tower connections, foundation bolts, blade, bearings, gearbox, shaft to hub connections and rotor blade to gearbox coupling

Time after time, case after case, Superbolt products prove their unparalleled quality and durability to this critical industry. In one example, a top customer in the hydroelectric segment recently reached out to Superbolt, simply to express their surprise and appreciation after removing nearly 30-year-old MJTs from their equipment – to discover that they were not only in remarkable condition, but also reusable!

# MINING

Harsh mining environments demand superior products, with safety at the forefront. Superbolt fulfills all of the mining industry's requirements through our innovative, safe, and easy-to-install products. Additionally, Superbolt experts are available round the clock to provide assistance with any customer challenges. These are just a few of the reasons why the world's leading mining companies count on Superbolt to consistently deliver top-notch tensioning solutions.

## Applications including

- Boom points
- Ring gears
- Side frames
- Hoist motors
- Pedestal tie downs
- Pinion gears
- Hoist and drag drums
- Split gears
- Bolted segments
- Excavator bearing caps
- Struts (whole strut kit solutions for mounting front suspensions on OEM trucks)
- Steering linkages
- Cutterhead motors
- Stageloader head drive
- Bearing column bolts
- Crusher hammers







# OIL & GAS

Superbolt products are used extensively throughout the oil and gas industry, where reliable and accurate bolt tightening is critical to operational efficiency. We are at the forefront of developing solutions to optimize bolt tightening during construction and maintenance operations, offering both standard and special tools. Working closely with our customers, we have developed a deep understanding of their needs and the requirements of the industry.

## Applications including

- Top drives
- Blow-out preventers
- Mud pumps
- Fracturing pumps
- Heat exchanger heads
- Turbine control valves
- Turbine joints
- Pipe flanges
- Anchor bolts
- Coupling



# DEFENSE

Superbolt tensioners are ideally suited for the many “can’t fail” extreme applications required for national defense. As one example, Superbolt offers Corrosion-Resistant Hull Integrity Stud/Bolt Tensioners. These Monel MJTs are designed as an alternative to Mil-N-25027/1 Heavy Hex Monel Self-Locking nuts. They are shock-qualified and saltwater-proof, ideally suited for commercial marine, Navy, and offshore applications. They are especially useful where space limitations exist.

## Applications including

- Reduction gear snubbers
- Shaft seal housing
- Shaft couplings
- Sea valves
- Steam valves
- Gearbox foundation bolting
- Machinery foundation bolting
- Weapon system foundation bolting
- Weapons shipping & handling





# STEEL, FORGING & PRESSES

Bolting applications in steel mills, forging and presses can be especially challenging. You need a bolting solution that can be installed and removed safely and quickly; one that will keep your bolted joints tight through demanding operations and improve your bottom line. That's where Superbolt comes in.

## Applications including

- Thrust collars
- Coupling bolts
- Mill motors
- Bearings
- Shaft mounts
- Roll tables
- BOF and EAF applications
- Coilers
- Cranes
- Press columns
- Tie rods
- Bearing blocks
- High-pressure piping
- Die cushions
- Cylinder ram bolting
- Anchor bolts

# OTHER INDUSTRIES

Superbolt products are used extensively across many industrial sectors — in fact, anywhere that critical bolting requires accurate and reliable tightening. Whatever the requirement, we promise a powerful and cost-effective solution.

Robust designs combine ease-of-use with reliable performance and low maintenance.

## Products for applications in

- Construction & Bridge Building
- Forestry & Agriculture
- Machine Building
- Manufacturing & Processing
- Railway & Transportation
- Space





# SAFE GUARDING HUMAN LIVES AND CUSTOMER INVESTMENTS

## NORD-LOCK GROUP

In 1982, Nord-Lock developed the original wedge-locking technology that secures bolted joints. Since then, the company has grown to include a range of cutting-edge bolting technologies that together, provide the most comprehensive bolting solutions on the market.

Owned by Swedish investment group Latour, Nord-Lock Group is a global partner for all industries. We are present in 65 countries, with six production plants and six technical facilities around the world.

Nord-Lock Group is on a mission to make the world a safer place and help our customers go beyond what's possible.

With a unique combination of bolting expertise and a comprehensive product range, we will provide you with the best solution for your bolting challenge.

### NORD-LOCK®

Creator of the original wedge-locking washer technology and global leader in industrial washer solutions.

### SUPERBOLT®

Inventor of the patented Superbolt multi-jackbolt tensioners, designed to eliminate unsafe bolting methods.

### BOLTIGHT™

Pioneer in innovative hydraulic bolt tensioning, specialising in extreme environments.

### Expander®

Leader in pivot pin technology, on a mission to end lug wear on industrial sites everywhere.



**65+**  
COUNTRIES

**25+**  
OFFICES  
WORLDWIDE

**500+**  
EMPLOYEES

**6**  
PRODUCTION  
PLANTS

**6**  
TECHNICAL  
CENTERS



# WHEN SAFETY REALLY MATTERS

Safer, easier to work with, and far more reliable than conventional bolting methods, Superbolt multi-jackbolt tensioners have proven their superiority in thousands of successful installations.



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