

Oil & Gas

Industry bolting solutions from the Nord-Lock Group



NORD-LOCK®



The Nord-Lock Group's bolting solutions hold the most extensive certifications in the bolt securing industry. We are recommended in several best practice documents and handbooks in the Oil & Gas industry.

www.nord-lock.com/certificates



The original solutions that you can trust

The Nord-Lock Group has been manufacturing safe and secure bolting solutions since 1982. Our products secure the toughest application challenges in the world and our expertise helps optimize design and maintenance procedures. Working with Nord-Lock gives an extra safety barrier for Oil & Gas operators.

Our extensive experience and track record with providing quality products, has made us experts in the field of bolting. Our customers are many and varied, and each has their own unique applications and challenges. Through close cooperation and with full attention to your demands, we are able to design solutions that suit your individual needs.

From wedge-locking solutions to Superbolt® multi-jackbolt tensioners, the Nord-Lock Group has developed technologies that are able to meet the demanding bolting applications of the oil, gas and petrochemical industries.

As industries develop and demand grows, our product range has expanded accordingly. Our combined experience and ability to design customer specific solutions, enables us to meet your toughest challenges.

We believe that the foundation of development lies in cooperation and partnership. In addition to our bolt securing solutions, we offer our expertise and testing facilities. By working together, we can help you lower your costs, reach higher profitability, and reduce downtime.



When you're many miles from the nearest coast, safety comes first.

Visiting an oil rig for the first time can be an overwhelming experience. After landing by helicopter, you see nothing but endless ocean in all directions. You're exposed to the sound of heavy machinery pounding through your daily routines. Strong winds threaten to pull you over the edge, and the smell of diesel is everywhere.

Helmets, earplugs, eye protection, and steel-toed boots are all standard attire. Drilling operations, by their very nature, expose crews to tremendous risk. With so many mechanical and hydraulic processes in operation, falling objects and malfunctions are hazards for even the most experienced staff members.

When working in such demanding conditions, safety is absolutely paramount. Cranes are swinging heavy objects across the deck; drills, pumps and shakers are in constant operation; and everything needs to be 100% reliable. At the same time, operations must be continuous. The pace needs to be fast and every minute of downtime is costly. Choosing the right bolting solution is of the utmost importance.

Fortunately, Nord-Lock's bolt securing systems suit all challenges and applications, and are not only safe and reliable, but also cost effective. This fact is confirmed by the thousands of Nord-Lock Group customers who depend on our products.

Choosing the right bolting solution is of the utmost importance.

Open spread to find out how Nord-Lock can secure your offshore operations.

Nord-Lock solutions in action

Oil & Gas and petrochemical production requires a wide variety of machinery with many critical bolting applications. Whether it is upstream or downstream, the Nord-Lock Group is the globally trusted partner when it comes to optimization of bolted joints. Today we provide safe and reliable bolting solutions for just about every application.

DRILLING EQUIPMENT

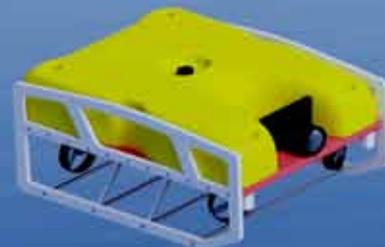
Drilling in tough conditions and extracting materials from the Earth, is no easy task. The demands placed upon bolted joints for this type of equipment is extreme, and the Nord-Lock Group has tackled them all. From iron roughnecks, to tongs and turn tables, trust the bolting experts for your critical equipment.

FLAME TOWER

The demands on the materials in this application are extreme. The fluctuating temperatures make it hard to maintain a sufficient preload that prevents the fasteners from loosening. Nord-Lock products made of heat resistant alloys can secure fasteners in high temperature applications. Nord-Lock wedge-locking solutions are commonly used.

ROV

ROVs (Remotely Operated Vehicles) need to operate deep beneath the sea, where they are exposed to intense pressure. It goes without saying that once underwater, joints can't be checked, let alone retightened. If things begin to loosen, there is little anyone can do. Our range includes products especially developed for marine environments to provide safe locking and high corrosion resistance even in the splash zone.



TOP DRIVE

While drilling, the top drive is exposed to constant vibrations and dynamic loads, and bolted joints need to hold. Depending on the design, challenges can include fastener size, accessibility, and the height of the application itself. Secondary retention is critical to achieving safety by preventing any fasteners from loosening. Nord-Lock washers, which are DROPS compliant, are an approved retention system trusted by many in the Oil & Gas industry. Multi-jackbolt tensioners are used on top drives to eliminate accessibility problems and make installation/removal safer and easier.



ROTATING EQUIPMENT

Bolted joints on rotating equipment must be easy to install and remove, and provide a secure solution that will survive constant vibration. The consequences of bolt loosening can be severe, ranging from expensive down time to damaged equipment. Nord-Lock offers solutions that are suitable for securing rotating and vibrating equipment such as shale shakers, and mud pumps.



DERRICK

A derrick, the strongest structure on an oil rig, is subjected to the loads of the crown blocks, top drive, drill string, and the motion of the sea. Therefore, the demand of safe joints and secondary retention is essential. Nord-Lock wedge-locking solutions are optimal for providing secondary retention. Additionally, they help to achieve greater profitability by reducing the number of costly inspections and man hours. With Superbolt multi-jackbolt tensioners, simple tightening and reduction of joint relaxation is possible even on the extremely large joints, starting from M64 (2 1/2") to secure the derrick foundation.

CRANES

To operate effectively, rigs require cranes to constantly transport material across the decks. Due to the heavy loads, these bolted connections are constantly pushed to their limits. As a result, only the best bolt securing systems can provide the sufficient safety. Superbolt multi-jackbolt tensioners secure the slewing-ring and wedge-locking products secure the arms.

PLATFORM

Without a stable structure, oil rig operations would not be possible. The Nord-Lock Group has been consulted on the design of the boltings of the platform legs and produced the multi-jackbolt tensioners, reactive nuts, ball-and-cup washers and tie rods. We can handle corrosion concerns, provide personnel for installation and inspection and provide the safety and security of a properly bolted joint.

BOP'S

Blowout preventers (BOP's) seal, control, and monitor flow from oil and gas wells, and need to cope with extreme pressure. The BOP is the only safety barrier between the rig and the crew and must never fail. BOP failure can also lead to oil leaks and potential environmental disasters. Manufacturers of BOP's demand permanent locking without any risk of failure. Both the multi-jackbolt tensioners and wedge-locking technology from Nord-Lock comply with these demands and are widely used by the leading manufacturers.

LAND BASED OPERATIONS

There are many critical applications on mobile land rigs and platforms such as mud pumps, BOP's and top drives. The high pressure mud pumps and the enormous stress of the shock loadings in fracturing operations become easily manageable in field operations with Superbolt multi-jackbolt technology.





PETROCHEMICAL PLANTS

Oil & Gas and petrochemical processing plants are filled with critical joints that are integral to safety and productivity. Turbines, compressors, heat exchangers, and flanges, are some of the components that are exposed to extreme pressure and vibrations. These critical components require a fail safe bolt securing system to avoid catastrophic incidents. As a result, Nord-Lock products are used extensively on these critical bolting applications.

... AND MANY MORE

These are just a few examples of the bolting challenges Nord-Lock has solved in the Oil & Gas industry. Other common applications are riser clamps, WOR (Work-Over Riser), actuators, and downhole tooling.

To discuss your particular application, contact us today!

Products & Services

Our product range is based on several technologies, all designed and developed in-house. With our vast experience in applications ranging from space to deep-sea explorations, we can find the optimum solution to virtually any bolting challenge including huge sizes (M1450 / 57")!



Our talented engineers are ready to help you find the right bolting solution according to your requirements. Visit www.nord-lock.com or contact your local Nord-Lock office for further information and product range details.

Wedge-locking solutions

Secures joints utilizing tension. Current range includes safety washers in various materials, combi bolts, and wheel nuts.

Superbolt tensioners

Utilizes multi-jackbolt tensioning. Our standard range includes nut-style and bolt-style tensioners, with several other pre-engineered designs available.

Expansion bolting

Secures against shear loading and replaces traditional interference or force fit bolts. Available together with multi-jackbolt tensioning technology.



Custom designs

Over the years the Nord-Lock Group has adapted their products to meet a wide range of applications, and is always ready to custom design new solutions.

Nord-Lock's product range extends to a wide variety of sizes, specifications, coatings and materials. A solution from us may also consist of a combination of technologies. If the products in our standard range do not meet your requirements, we are happy to work together with you to design a custom solution specifically for your needs.

Sourcing	Design / Production	Aftermarket
<p>Life Cycle Profitability and cost justification</p> <p>Cost savings provided by increased service life.</p>	<p>Field Application Engineers, Technical Centers & Project Engineering</p> <p>Fast discussion and solution. Near by selling and webstore. Custom design.</p>	<p>On-site and remote product training as well as service and retrofitting</p> <p>Increasing the knowledge for operators and engineers. In-house support.</p>

Performance Services

In addition to providing effective bolt securing solutions, the Nord-Lock Group can further optimize your operations through our Performance Services.

By utilizing Nord-Lock Performance Services you can further increase your productivity and profitability. We can help solve a specific problem, or we can explore possible improvements to your current operations. Our global range of services includes various support features and tools throughout sourcing, design/production, and aftermarket. We will ensure that you get the most cost effective solution, with maximum safety and correct product training.

Customer case studies – solutions for all operations

Satisfied customers using products from the Nord-Lock Group include Shell, BP, Total, Transocean, Archerwell, Aker Solutions, NOV and Technip. Below are two application examples; more studies available through www.nord-lock.com/oil-gas.

IHC Engineering Business

Deep below the churning waves, IHC Engineering Business's massive pipeline plough gouges through the seabed with a tow force of up to 4,000 kN. It excavates a stable 2.5 m (8.2 feet)-deep trench, moving a staggering 60–65 m³ (2,100-2,300 ft³) of soil a minute. Variations in the seabed and rock in the soil create vibrations and shock loads that the plough must withstand as it works.



It is part of a complex and precisely choreographed process for protecting, stabilizing and insulating oil and gas pipes under the sea; a 'rigid' concrete-clad pipe is laid directly onto the seabed by a pipelay vessel, to be then buried by the pipeline plough which digs the trench beneath the pipe as it is pulled along the pipe route on the seabed. A backfill plough then scoops back the excavated soil to cover the pipe.

IHC Engineering Business, which is based in Northumberland in the UK, turned to Nord-Lock in 2008 after seeing a demonstration of how their wedge-locking solutions performed compared with the more conventional methods used on the ploughs. Today more than a thousand pairs of Nord-Lock washers are used throughout the ploughs for applications where clamp load must be maintained in the bolted joints.

Weir SPM

As the world's energy demands increase, hydraulic fracturing's ability to tap into new sources of natural gas and petroleum, is becoming increasingly valuable. However it can also be a demanding industry since it requires millions of liters of water, sand and chemicals, to be injected at high pressure down wells that can reach as deep as 3,000 meters (10,000 feet) below the surface.

Weir SPM is one of the market leaders in designing and manufacturing frac pumps and equipment. The SPM[®] Destiny™ TWS 2500 frac pump is designed for operations in today's harshest multistage frac applications with a 2,500 hydraulic horsepower rating, 111,934 kg (273,000 lbs) rod load capacity, and a 10" stroke. The longer stroke means fewer cycles are required to produce an equivalent flow rate compared to an 8" stroke quintaplex pump. The result is an overall improvement in pump durability.

The use of Superbolt tensioners at the pump's fluid end – a component of the pump subject to frequent wear and maintenance – enhances the durability of the pump. Due to short turn around times, anything to improve service replacement times is a benefit to the service company. The Superbolt tensioner assists in a secure bolting solution that only requires hand tools and is hugely beneficial in terms of saving time, costs and downtime.

Nord-Lock engineers have been involved throughout the entire development process for the SPM[®] Destiny™ TWS 2500, from providing off-the-shelf components for the original prototype, assisting with field tests, to providing specially adapted, custom designed tensioners for final production.



When **safety** really matters



Joining parts together is one of the most critical steps when delivering a product or system. The Nord-Lock Group is focused on solving the toughest bolting challenges. We offer a unique combination of bolting expertise and a wide product range, including wedge-locking technology and Superbolt tensioners – all designed and developed in-house.

Nord-Lock holds decades of documented success in every major industry, including oil and gas, energy, transportation and mining. Our Production System includes rigorous internal testing and full traceability, and our products hold several certificates from independent institutes including AbP, ABS, DIBt, DNV and TÜV.

The tools available through Nord-Lock Performance Services add value throughout a project and ensure that your bolting application pays back multiple times. We can also assist you in the design phase with joint simulation and testing. Additionally, we help you ensure successful operations over time with our onsite support and remote product training.

Our mission is to safeguard human lives and customer investments by securing the world's most demanding applications. The Nord-Lock Group looks forward to being your partner in bolting solutions.

Authorized distributor:

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