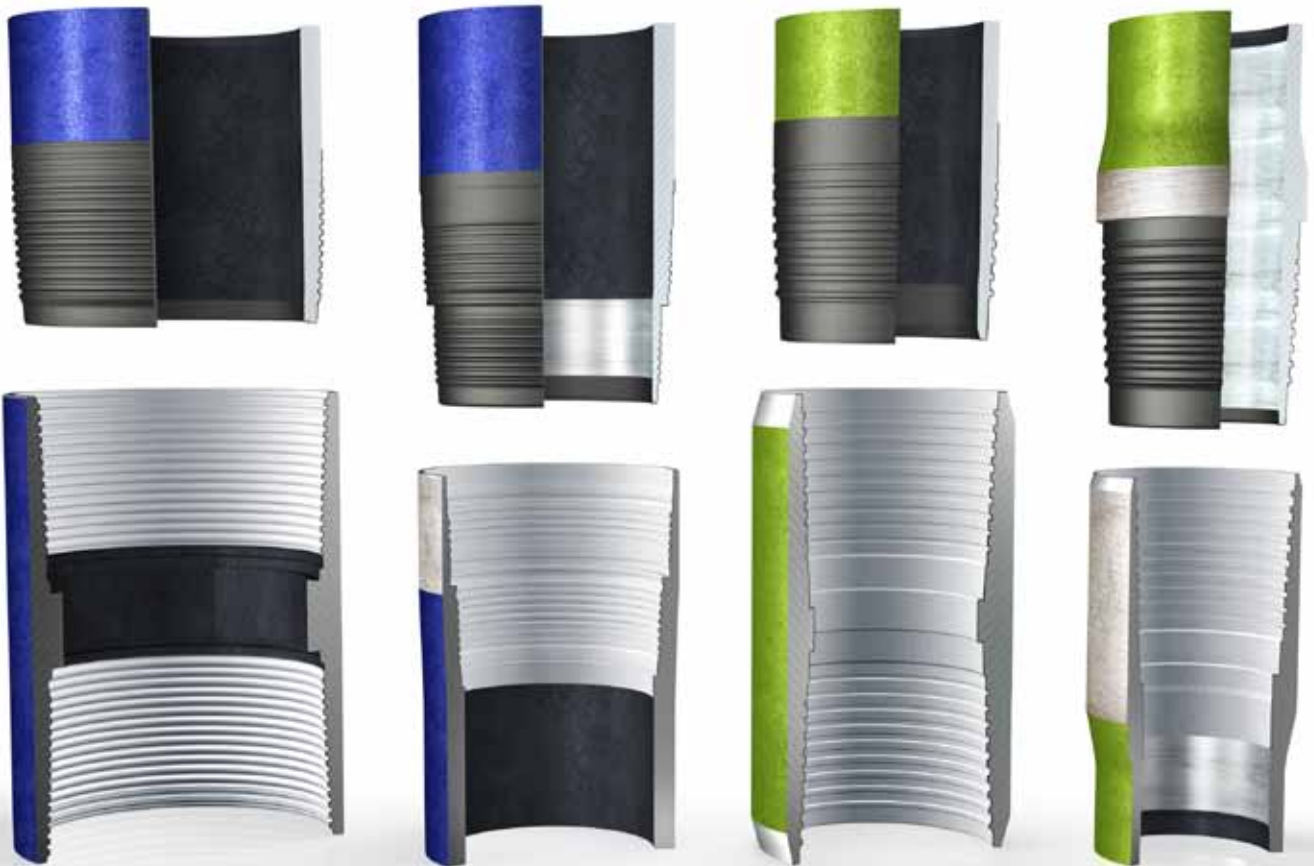


Dopeless[®] Technology



Dopeless® Technology

Dopeless® technology is a breakthrough for premium connections, offering distinct operational and environmental advantages. Unlike standard connections with liquid-based lubricants, Dopeless® technology is a completely dry, dope-free coating applied at the mill in the final stages of connection manufacturing to save operators time in the field.



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TenarisHydril
Wedge Series 500™ with
Dopeless® technology

Dopeless® technology is a fully engineered solution, applied after pipe threading in a completely controlled industrial process. This ensures the appropriate amount of lubrication is consistently applied to the connection and guarantees that the performance and quality of the coating last throughout the life cycle of the connection and string. This integrated and automated process provides operational reliability and increased efficiency by eliminating standard preparation activities that would typically be conducted in the field.

While simplifying operations, Dopeless® technology also enhances the performance of TenarisHydril's most advanced premium connections. Dopeless® technology's reliability continues to exceed operators' expectations in every type of demanding environment. The original pioneer of dope-free technologies, Tenaris launched full scale laboratory testing at its world-class R&D centers during the late 1990s in response to a customer's demanding North Sea operation.

A HISTORY OF FIRSTS

2003

First offshore running of Dopeless® on TenarisBlue™ for ConocoPhillips' Ekofisk project in Norway.

2004

Debut of Dopeless® technology on TenarisBlue™ in Venezuela at Total's Jusepin field.

Statoil opts to use TenarisBlue™ with Dopeless® technology for Snøhvit project, signifying the first entire field to use dope-free connections.

First installation of a Dopeless® high chromium alloy. A 13 Cr tubular string was installed at ConocoPhillips Ekofisk.

Proven Performance

The benefits of Dopeless® technology have been proven in many different applications since its introduction on TenarisHydril Blue™ connections in the North Sea in 2003. Now these benefits will also be available

on Wedge Series 500™ and other TenarisHydril premium connections. Tenaris provides running support for all Dopeless® operations through its integrated global network of field services, repair and technical support teams.



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[Overview of a Dopeless® production line](#)

2005

Snøhvit well becomes first 100% Dopeless® well ever installed. A 25 Cr Dopeless® string is also run for the first time.

2006

Newly improved version of Dopeless® technology introduced to market.

2007

Tenaris's integration of Hydril results in a comprehensive line of premium connections known as TenarisHydril.

2008

Global R&D project launched at Tenaris R&D centers in Argentina and Mexico to develop Dopeless® technology on Wedge Series 500™ connections.

2009

Dopeless® is applied to TenarisHydril Wedge 563™ and Wedge 523™, proving its capability with uniform make and break and torque performance during a rig test in Houston.

2010

TenarisHydril Wedge 563™ with Dopeless® technology proves its operational and environmental advantages during a field running in the U.S.

2011

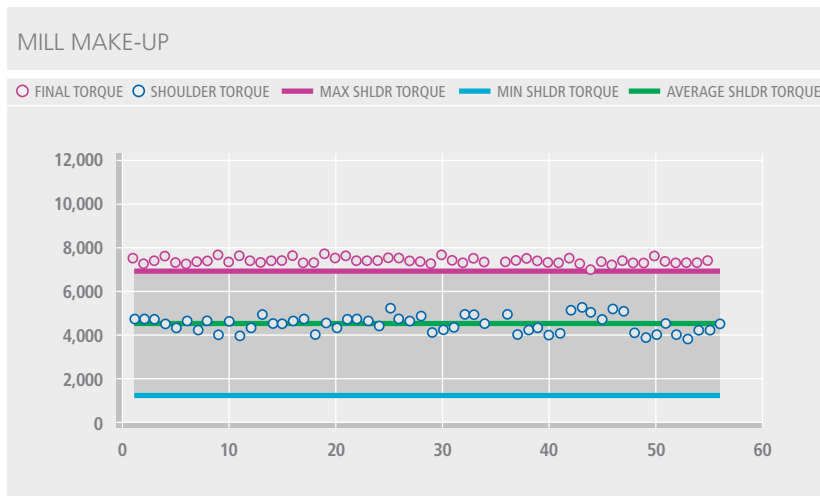
TenarisHydril Wedge 521™ with Dopeless® technology was selected for extended reach wells in the UAE.

Dopeless® technology is run in an offshore project using Wedge 523™ in the Mediterranean.

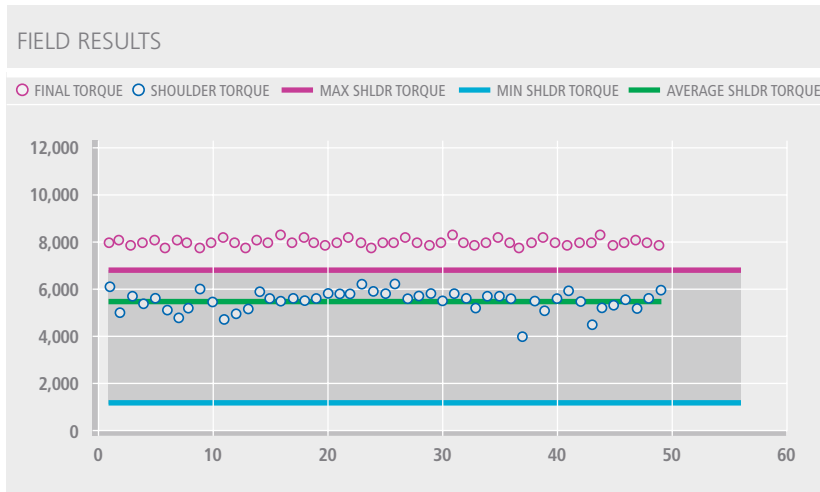
Dopeless® technology is available on TenarisHydril premium connections in a wide range of casing and tubing dimensional ranges, carbon steel (both API and proprietary), 13 Cr and Corrosion Resistant Alloys (CRAs).

Developed and tested in accordance with ISO 13679 standards, TenarisHydril premium connections with Dopeless® technology offer advanced performance consistency, including superior make and break capacity.

The stability of Dopeless® technology's make-up performance is reflected in these lab-tested and field-proven make-up results.



5 1/2" 17 ppf L-80 13 CR TenarisHydril Blue™ with Dopeless® technology



5 1/2" 17 ppf L-80 13 CR TenarisHydril Blue™ with Dopeless® technology

5 1/2" 23# TN110 TenarisHydril Blue™ with Dopeless® technology after three make and breaks.





Dopeless® technology's unique engineered coating protects the integrity of the connection's metal surface, which helps to ensure:

Resistance to any potential galling, including when high chrome, CRA materials are used.

Corrosion protection even during prolonged exposure

Superior torque stabilization



Dopeless® technology is available on the following TenarisHydril premium connections:

BLUE™ SERIES

Blue™ 3 1/2" - 13 5/8"

Blue™ Thermal Liner 3 1/2" - 10 3/4"

Blue™ Near Flush 5" - 13 5/8"

WEDGE SERIES 500™

Wedge 563™ 2 3/8" - 16"

Wedge 523™ 7" - 16"

Wedge 521™ 4" - 18 5/8"

Wedge 513™ 4 1/2" - 16"

Wedge 511™ 2 1/16" - 18 5/8"

Wedge 533™ 2 3/8" - 7 5/8"

LEGACY SERIES

ER™ 7" - 24 1/2"



Operational Benefits

The Dopeless® solution arrives rig-ready, saving time and money while reducing risk.

Dopeless® eliminates the need to clean and remove storage compounds from connections prior to installation. By simplifying handling and installation procedures, less manpower is required. Running of the pipe at the rig is safer, easier and faster in comparison to standard connections.

Dopeless® technology's dry, multifunctional coating offers several key benefits:

- Corrosion-resistance, offering superior preservation of the connection during storage.
- Superior metal surface protection helping to reduce the risk of connection damage during make-up and handling, while ultimately minimizing connection repairs.

DOPELESS® BENEFITS	
	
Improved Operational Performance	Improved Well Productivity
<ul style="list-style-type: none"> Less pipe handling Reduced operational risks Faster, safer installation Simple preparation for well delivery Easier management of rig returns Avoids reapplication of lubricant in make and breaks 	<ul style="list-style-type: none"> Reduces risk of sand screens clogging in water injection wells Minimum skin/formation damages Better downhole operations (logging, coiled tubing, tractors) Eliminates drilling fluids contamination with dope

The Dopeless® dry coating technology provides distinct advantages to a variety of extreme onshore and offshore environments.

Offshore

Dopeless® technology enhances operational reliability and efficiency. The cleaner rig floor provides a safer workplace.

Arctic

Dopeless® technology protects the connection's mechanical integrity and performance even under severe arctic temperatures. Complications associated with dope compounds that freeze are eliminated due to the dry, non-stick Dopeless® coating.

Desert

The non-stick Dopeless® coating prevents connection contamination from sand, dust and other particles, which can potentially hinder connection make-up and performance.

Shales

In addition to reducing the environmental footprint, Dopeless® technology offers efficient drilling, including reduced running time and costs.

Jungle

Contaminant-free Dopeless® products arrive rig ready for environmentally sensitive areas.

PREPARATION AND RUNNING



Standard Connections

Dopeless® Connections

- Start/Step 1 Remove thread protectors
- Step 2 Clean and dry thread protectors
- Step 3 Clean and dry connections
- Step 4 Measure – Drift – Inspect Connections
- Step 5 Apply thread compound
- Step 6 Re-apply thread protectors
- Finish/Step 7 Waste management and disposal

- Start/Step 1 Remove thread protectors
- Step 2 Measure – Drift – Inspect Connections
- Finish/Step 3 Re-apply thread protectors

STORAGE BENEFITS



Dopeless® provides long-term storage benefits, offering strong protection of the connection without the need for storage compounds. Even after being stored by the North Sea for more than four years, the TenarisHydril Blue™ connection with Dopeless® technology remains well-preserved.

Specialized thread protectors also help to eliminate contamination from external elements by sealing against the pipe body.

Health, Safety and Environmental Benefits

With Dopeless® technology, operators provide safer and cleaner workplaces for the rig crew and can be assured of compliance in environmentally sensitive areas.

HEALTH, SAFETY AND ENVIRONMENTAL BENEFITS



Safer and cleaner workplaces and less OCTG handling provide health and safety advantages while reducing risk



No thread compound, grease, oil or any other additive is released throughout the life cycle of the connection



No cleaning solvents, soaps, chemicals or high-pressure cleaning are required

The Dopeless® coating withstands multiple make-ups



Minimizes discharge of hazardous materials in both well site and preparation operations because Dopeless® is completely dry

Reduced environmental footprint



The protector is clean, making protector recycling simpler and more cost-effective



For additional information, please visit
www.tenaris.com