HYTORC®

CLAMP®

International Patent
Applied and Received

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The CLAMP® Tension Nut

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How do you get the desired bolt load up to 90% of yield precisely with a nut of same size as the nut it replaces? With HYTORC!

If Time is of Essence and Bolt Load Precision is a Must, the **HYTORC-CLAMP®** is the Answer! A simple, 3-part nut has an outer sleeve that turns on an inner sleeve connected with the bolt and on a washer spline-connected with the inner sleeve.

A high-speed HYTORC tool stops the inner sleeve from turning while turning the outer sleeve at a known friction. The inner sleeve is pulled up, the bolt is stretched to within + 4% of the preset Bolt Load, Side load- and Torsion-free.

Amongst Tension Nuts
some are too high
some are too wide
some are complicated
most are inaccurate!

That leaves HYTORC!

When Side-Clearance is limited - the CLAMP is a Must!

International Patent Applied and Received

Finally over-pull and elongation measurements are Gone!

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How Does It Work?

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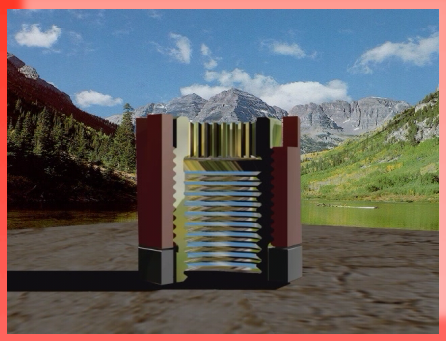


Award-winning

The CLAMP Tension Nut

The **HYTORC-CLAMP®** is the first mechanical tensioner that permits accurate bolt load setting without diverting to torque or pulling force. The **HYTORC-CLAMP®** consists of a washer and a nut connected to an inner sleeve that is connected to the bolt end. When the inner sleeve is held stationary by the tool that turns the nut, the inner sleeve is pulled up along with the bolt, - torsion- and side load free.

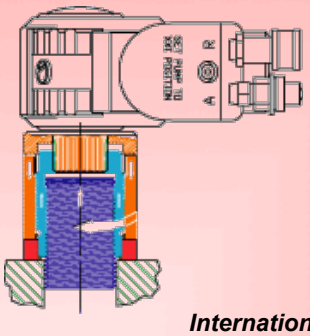
Elimination of all Unknowns!

Known Friction
Known Forces
NO Side Load
NO Bending Forces
NO Torsion
NO Overpull
NO Bolt Relaxation
NO Jackscrew Yielding!

JUST Precision Bolt Load!

As the nut turns on the washer and the inner sleeve-thread at a known coefficient of friction, the residual bolt load or pre-load can be calibrated in a traceable way with an unprecedented accuracy of + 5%.

The **HYTORC-CLAMP®** is ISO, TUV and Pressure Vessel certified.



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All by Remote Control!

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CLAMP® Specifications

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Regular Clamp
for regular length bolts. Outside Diameter 1.6 times bolt diameter.
Height: 1.25 times bolt diameter

Through-bolt Clamp
Outside Diameter 1.6 times bolt diameter. Height: 1.25 times bolt diameter.

Limited overhead clearance Clamp.
Outside Diameter: equivalent to heavy hex nut
Height: 1.1 times bolt diameter.

Smart-Stud for extreme side-clearances. Outside Diameter: 1.5 times bolt diameter. Height: 1.25 times bolt diameter

Material:	Regular: 4340 Outer Sleeve B-16 Inner Sleeve & Washer Heat: Stainless Steel 422 Others: As per requirements
Load Chart:	Provided No surface-turning No thread-turning
Sizes:	English and metric, ½" to 7" bolt diameter
Bolt Load:	From 10,000 lbs to 1.4 Million lbs
Load Accuracy:	Calibrated + 5%
Warranty:	Through first disassembly
Service:	First installation supervision

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Reliable Bolt Load Precision, FAST! All by Remote Control!

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CLAMP® Independent Tests

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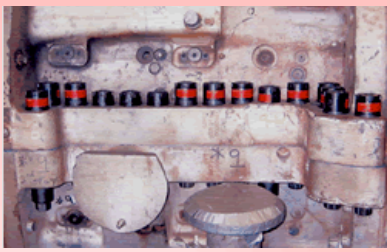
Torque and Pretensioning Force Test
Independent test performed by **BASF AG** on the HYTORC-CLAMP to determine:

- Determine the accuracy and scatter of the pretensioning force when several **CLAMP** connections are tightened to the same torque setting;
- Make a statement about the tightening factor alpha;
- Measure the torsional moments;
- Demonstrate that the **CLAMP** does not rotate on the contact surface;
- Demonstrate that the hydraulic torque wrench does not need any eccentric reaction arm
- Demonstrate that no bending moments are introduced into the bolt connection;
- Perform a static shear test



Their Findings:
- The **CLAMP** is a machine part which allows a lateral load-free and torsion-free tightening of bolt connections without external support. Bending loads do not occur on the bolt fitting.
- The bolt cannot turn with the **CLAMP**, and the **CLAMP** also does not turn on the contact surface.
- The low scatter in the pretensioning force values is due mainly to assembly conditions which can be controlled and checked better than those of bolt connections with usual standard hex nuts.
- The scatter in the pretensioning force is very small, since the surface quality is always the same; in the tests the maximum scatter was only 3.5%. Torsional moments did not occur in the bolt fittings.
- The torque wrench operates without an eccentric reaction support arm, as it is supported on the **CLAMP** itself.
- The use of the **CLAMP** can clearly minimize the scatter in the pretensioning force during tightening.
- The contact surface under the **CLAMP** is only loaded by pressure.

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Independent Tests Prove HYTORC Tools are #1!

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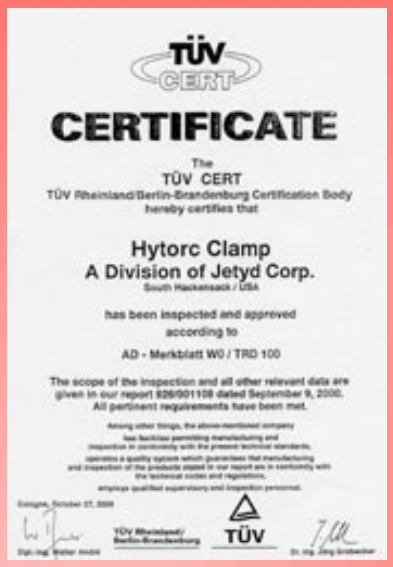
CLAMP® Certifications

The CLAMP® Tension Nut, has received numerous Certificates of Inspection and Quality worldwide. You may view the full certification by downloading the PDF file below.

Pressure Vessel Certificate



TÜV CERT

CERTIFICATE

The
TÜV CERT
TÜV Rheinland/Berlin-Brandenburg Certification Body
hereby certifies that

Hytorc Clamp
A Division of Jetyd Corp.
South Hackensack / USA

has been inspected and approved
according to

AD - Merkblatt W0 / TRD 100

The scope of the inspection and all other relevant data are given in our report 826/001108 dated September 9, 2000. All pertinent requirements have been met.

Among other things, the above-mentioned company has facilities permitting manufacturing and inspection in conformity with the present technical standards, operates a quality system which guarantees that manufacturing and inspection of the products stated in our report are in conformity with the technical codes and regulations, employs qualified supervisory and inspection personnel.

Cologne, October 27, 2000

TÜV Rheinland/Berlin-Brandenburg

TÜV

Dr.-Ing. Jörg Grotewohl

Nuclear Vessel Certificate

devo

3.2 Endabnahmezertifikat - Äußere Hülse /1

TÜV

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The HYTORC Clamp-tested and certified to be the most accurate and smallest Tension Nut in the World!

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CLAMP® Tension Nut Awards

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Never in the 36 years of Product Innovations has HYTORC received as many international Engineering and Technology Awards as with its present Product Line!

CLAMP™ NUT

Innovative Product Award
Germany 1998

CLAMP™ NUT

Plant Maintenance Award
Japan 1999

CLAMP™ NUT

11th International Technology Award
Europe 1997

The HYTORC Clamp-tested and certified to be the most accurate and smallest Tension Nut in the World!

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