Bolting Applications Booklet - Worldwide

WINDMILL

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HYTORC® Since 1968

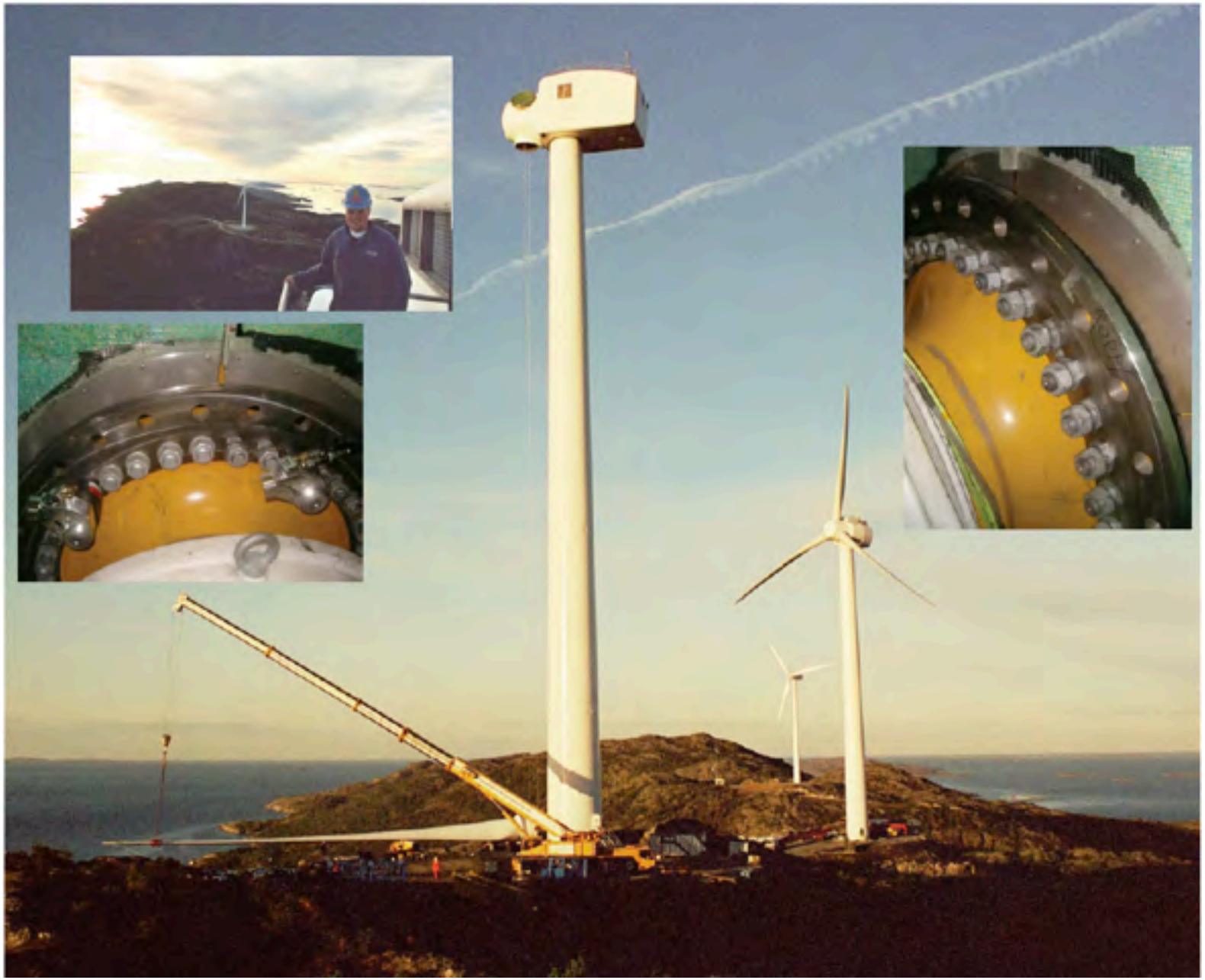
Ma'Aref TECHNOLOGIE

Bolting Applications Booklet - Worldwide

HYTORC® We keep the World bolted together!
Since 1968

WIND POWER Applications

Industrial Bolting Tools for the Wind Power Generation Industry, Wind Turbines and Wind Farm Applications.



In the previous turbine constructions, ScanWind experienced back side nut turning,which affect the bolt load accuracy and increase unnecessary bolting time. In addition inverted bolting at above 90meter off the ground level was a time consuming process. With HYTORC LoaDISC tightening of nearly 1,000 bolts became a large time saving with no bolt turning and tool holding.
All bolts were tightened to achieve 70% of yield using Grade 10.9 bolts per DIN6914/DIN6915 General Standard for wind turbines.
Equipment Used: HYTORC Avanti-1, -3, -5 and –10 and LoaDISCs

ScanWind Turbine Construction in Vinkna, Norway 2005

The first construction of wind turbine started in early Spring of 2004. With successful installation of the first unit, ScanWind and NTE made a projection of the total of 99 wind turbines in the Vinkna bay area. Bolt sizes used for each section of the turbine are M42 x 4.5 with Delta Tone anti-rust coating (quantity 544) for Foundation & Tower Sections, M30 x 3.5 (quantity 140) for Turret Bearing Base, M56 x 5.5 (quantity 40) for inverted Hub Flange and M36 x 3.5 (quantity 240 plus) for inverted Rotor Blades Flange.


3 Blade flanges total 180 M36 Load Disc with Normal Hex
1 flange with 40 each M56 Load disc with Normal Hex
1 flange 112 each M30 Load Disc with normal hex
544 each M42 Load Disc with 70 mm hex
Totally 4 flanges used on the shaft
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TECHNOLOGIE
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Since 1968
11 2 2004
This is a Dodge Ram 2500 … it gives you an idea of the wind mill size !!

Customer: AN-Windenergy

PROBLEM: Customer had a water leakage problem between the Tower Flanges, especially when it rains. The tightening of bolts were done with 2800kN force with hydraulic torque wrenches. The Tower Flanges consist of three flanges, each one is about 33 meters. Due to the size and weight of each flange section, it was very hard to tighten the bolts evenly. This was causing water leaking problem inside the Tower Flanges.

The Institute of Steel-Technology in Essen, Germany, developed a new tightening procedure to solve this problem of leaking by inserting a thin soft steel plate between the flanges. When the flanges are tightened the plate will work just like a gasket in chemical flanges. This system works, but also required torsion-free bolting procedure with an accurate bolt load. Initially the Institute of Steel-Technology was going to use hydraulic tensioners, because they did not know about HYTORC's advanced bolting technology.

SOLUTION: HYTORC introduced CLAMP Nuts to them, because CLAMP Nuts are 100% side load free, can guarantee %5 bolt load accuracy and can be repeatedly used. In addition, unlike hydraulic tensioners, CLAMP Nuts do not require the bolt to be overstretched. Tensioners require bolts to be stretched with 1500 kN which is beyond yielding of 12.9 quality M42 size bolts. With CLAMP Nuts, customer simply has to set pump pressure to achieve desired final bolt load which is 1000kN. To make sure that CLAMP Nuts can be used with this high bolt load, we offered customer a custom CLAMP Nuts with M52 body diameter.

JOB: HYTORC loosened all 180 bolts from the Tower Section, so thin steel plates can be inserted. 22 of CLAMP Nuts were used at one section at a time with 12.9 quality (higher quality) M42 bolts to deform the steel plate to the shape of flange. Then they reopen these 22 CLAMP Nuts and 12.9 bolts to replace with 10.9 standard quality bolts and regular hex nuts to tighten flange with 2800Nm. The same procedure was applied 8 more times to tighten the entire bolts of the Tower Section.

-

HYTORC®

MUMBAI - INDIA

Territory Manager: **BALA**

Date 15/04/2004
Company Name **HYTORC MUMBAI**
Company Address **306, Arenja Corner,**
Street **Sector 17, Vashi,**
City **Navi Mumbai 400701**
State **INDIA**
Zip Code **Tel: 91-22-55911164**

Selling Cycle or Activities Leading Up to Application

Decision Makers Project Engineer
End Users
Sales Skills STEALTH-4 & ST-4 208 R/L Used,
Quote with a QAS230.
Demo
Presentation Wind Farm foundation Bolts 2-1/2" A/F.

Description of Application

Industry
Product
Accessories
Pumps

Previous method was flogging which the customer was never very happy with due to it being an unsafe & inaccurate method.

Benefit To Customer
Time/Speed
Cost Savings
Safety/Risk
Quality
Accuracy
Weight
Service
Simplicity

Problem was the very high winds made these structures unstable if the foundation bolts where not secured correctly.
Also the project engineer in charge had to sign off on the completion of this project.
He took out **"Hytorc Insurance"** to quote the customer, by using the Stealth.
The outcome was once again a very happy HYTORC customer.

The New HYTØRC

Territory Manager

Date 19th August 2003

Wind Energy company in
came up with a problem that rain was
coming in between the Tower Flanges.
So specially made small steel plates where
placed between the flanges like a seal to
stop this problem.
To achieve the above, Qty 22 Clamp Nuts

ıtion

M42 (In a M52 body) where used to clamp
the small steel plates between the flanges
at 1,000 KN on a M42 grade 12.9 bolt.
After CLAMP tightening the Wind Mill guys
mounted the normal Hex nuts with our
AVANTI-5 up to 4,600 Nm.

Benefit To Customer

Time/Speed
Cost Savings
Safety/Risk
Quality
Accuracy
Weight
Service
Simplicity

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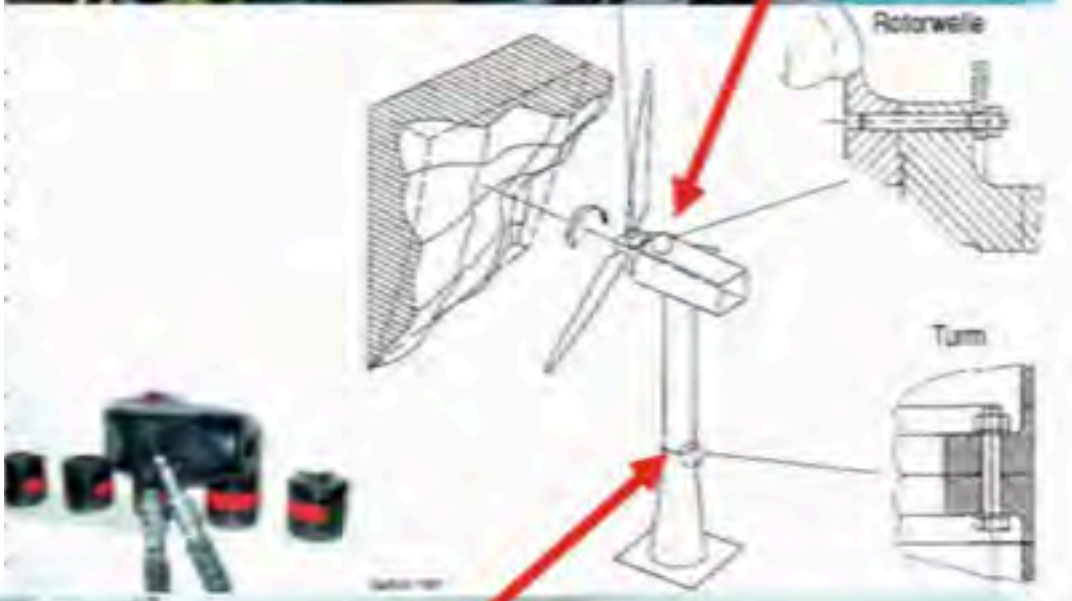
Since 1968



THE NEW ENERCON WINDMILL

WITH AVANTI AND STEALTH

HYTORC

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HYOSUNG

HYOSUNG CORPORATION
SOUTH KOREA
MOON-HYEON NO
www.hyosung.co.kr

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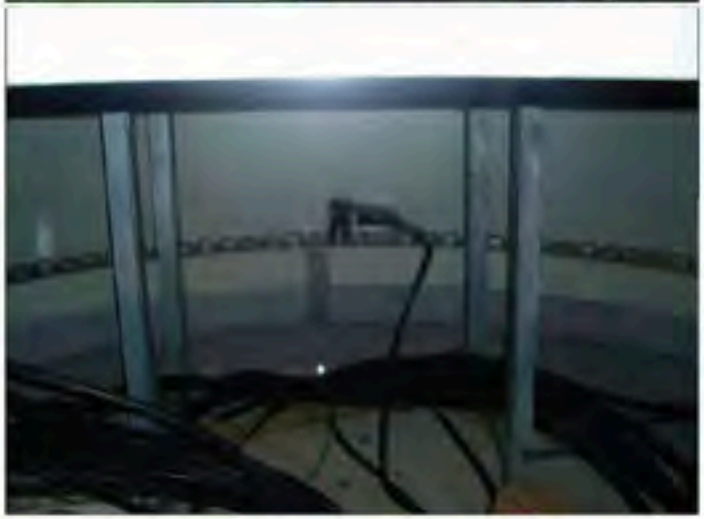


Stealth-8 with AF 85mm link &
Hex to Square Drive Adaptor
Application : Wind Turbine Tower
LEAKAGE-ZERO!

HYTORC®
South Korea

STEALTH®

http://www.hytorcsouthpacific.com.au

Zhongshan Mingyang Electrical Appliance Co., Ltd
Zhongshan City Guangdong Province, P.R.C

Blade bolts: M30x3.5, grade 10.9

Turbine designer needs the bolt be stretched to 60% yield stress directly. For the space limited, normal tensioner can't be put into place that makes customer choose LOADISC stretch to load technology.

HYTORC ® We keep the World bolted together! Since 1961

USED TOOLS: AVANTI-1 ×3 & JetPro 10.3-4T Pump with SIMULTORC system.

Application: Used 54×3 HYTORC LoadDiscs on hub bolts

No side load, No reaction arm, No handhold!
More higher safty, speed and accuracy!

HYTORC

CHINA
Territory Manager: Bruce Wu

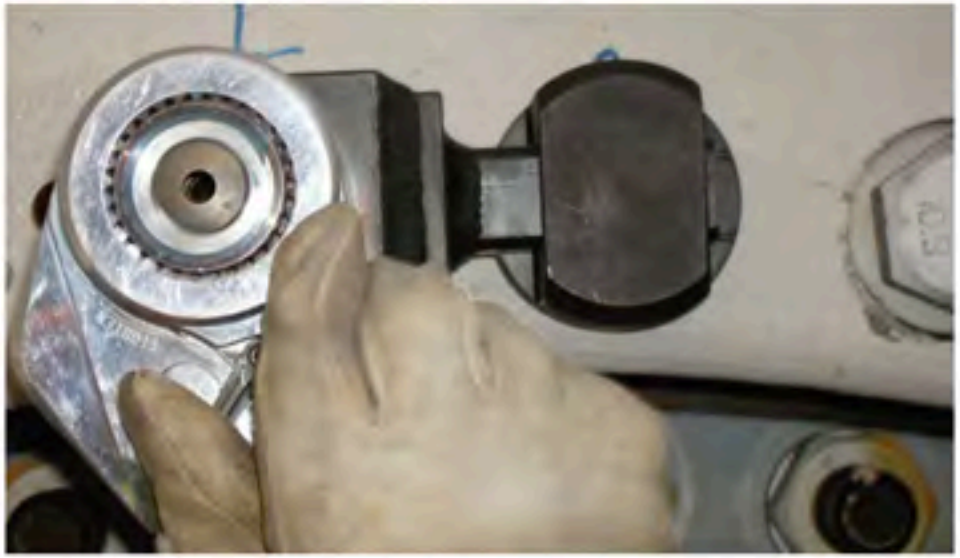
www.hytorc.com

BED PLATE TIGHTENING

BED PLATE TIGHTENING

WINDMILL BLADES

WINDMILL BLADES



GEARBOX APPLICATION






GEARBOX APPLICATION

WINDMILL GENERATOR

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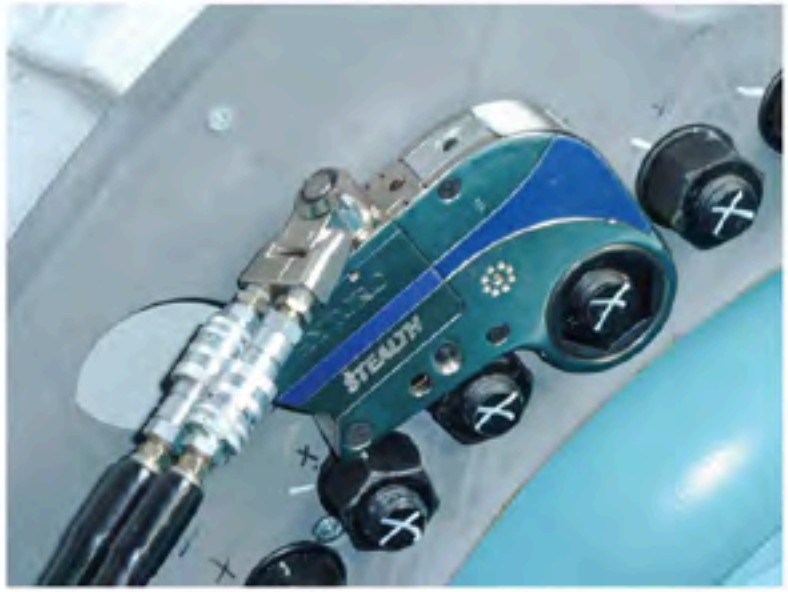
ROTOR



WINDMILL ROTOR

SHRINKDISC APPLICATION

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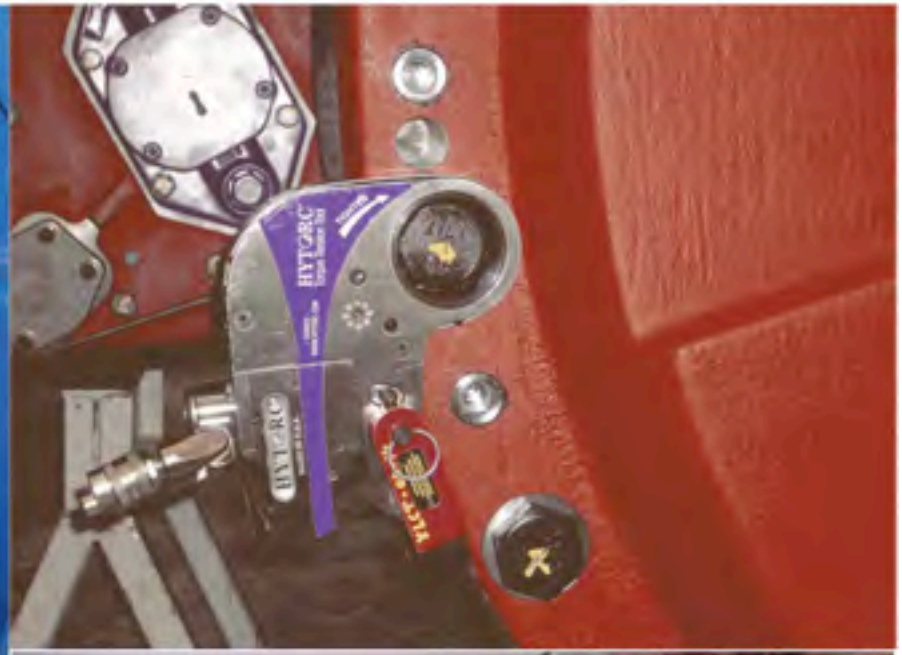

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TOWER

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TOWER

YAW DRIVE

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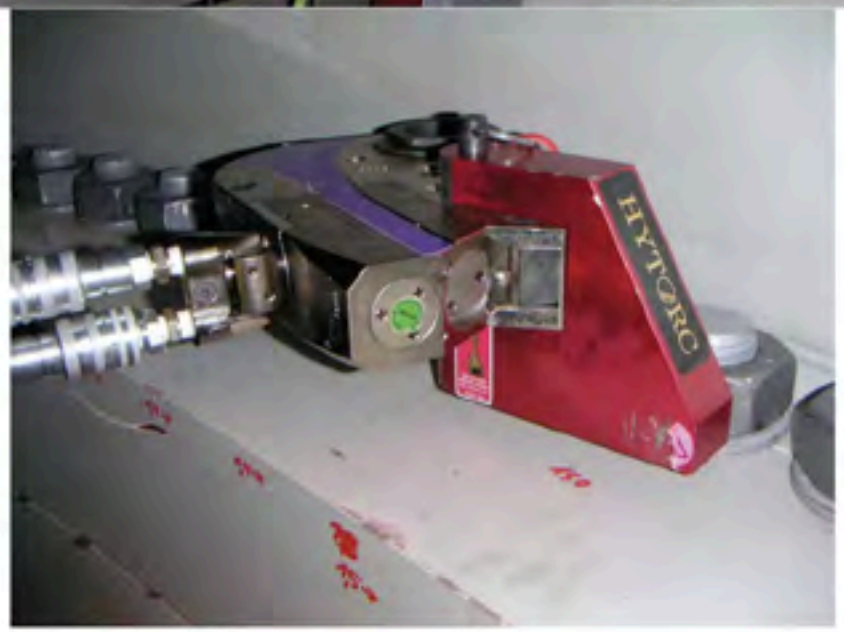
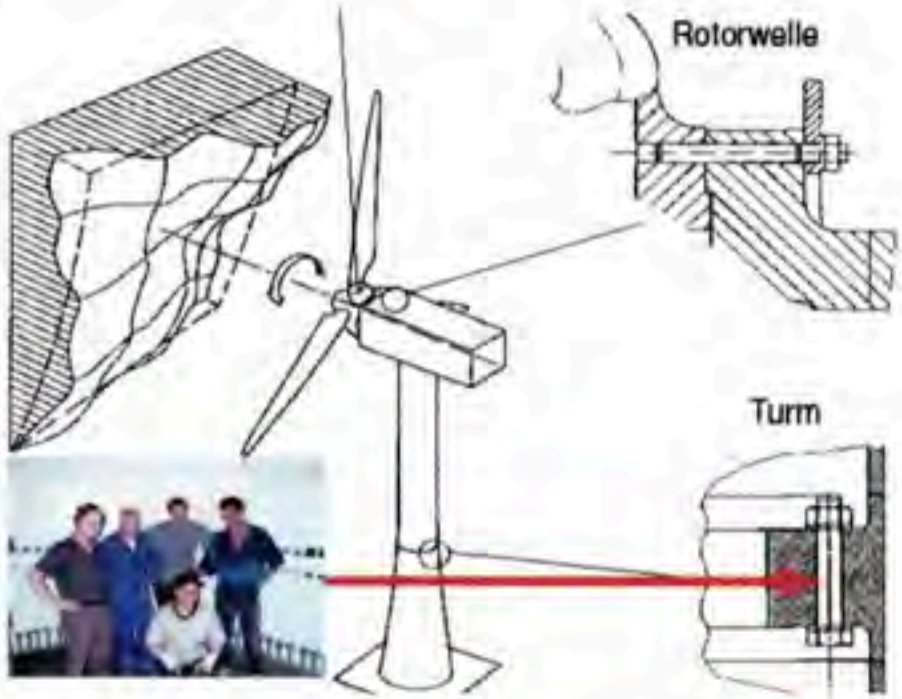


CLAMP™

M42 in Body M52 Turbine Style System in a wind mill tower



A wind mill company in germany came with the problem that rain is coming in on the tower flanges. Special small steel plates between the flanges like a seal will stop this problem.

We got the order for 22 pieces CLAMPS's in M42 (Body M52) to press the flanges with the small steel plates with 1.000 kN on a M42 12.9 bolt.

After CLAMP-tightening the wind mill guys mounted the normal hex nuts with AVANTI-5 up to 4600 Nm.

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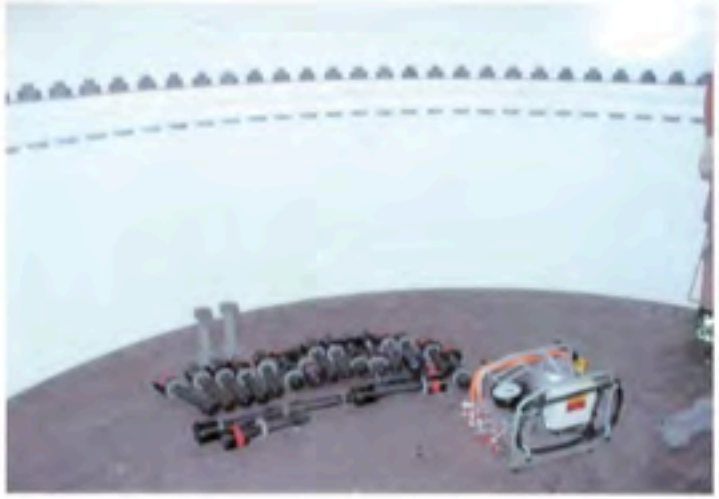
... the old normal way ...



... in a loosening procedure.

... the end of the day !

Time for tightening 1 bolt up to 1000 kN = 1,5 Minutes

HYTORC ACCESSORIES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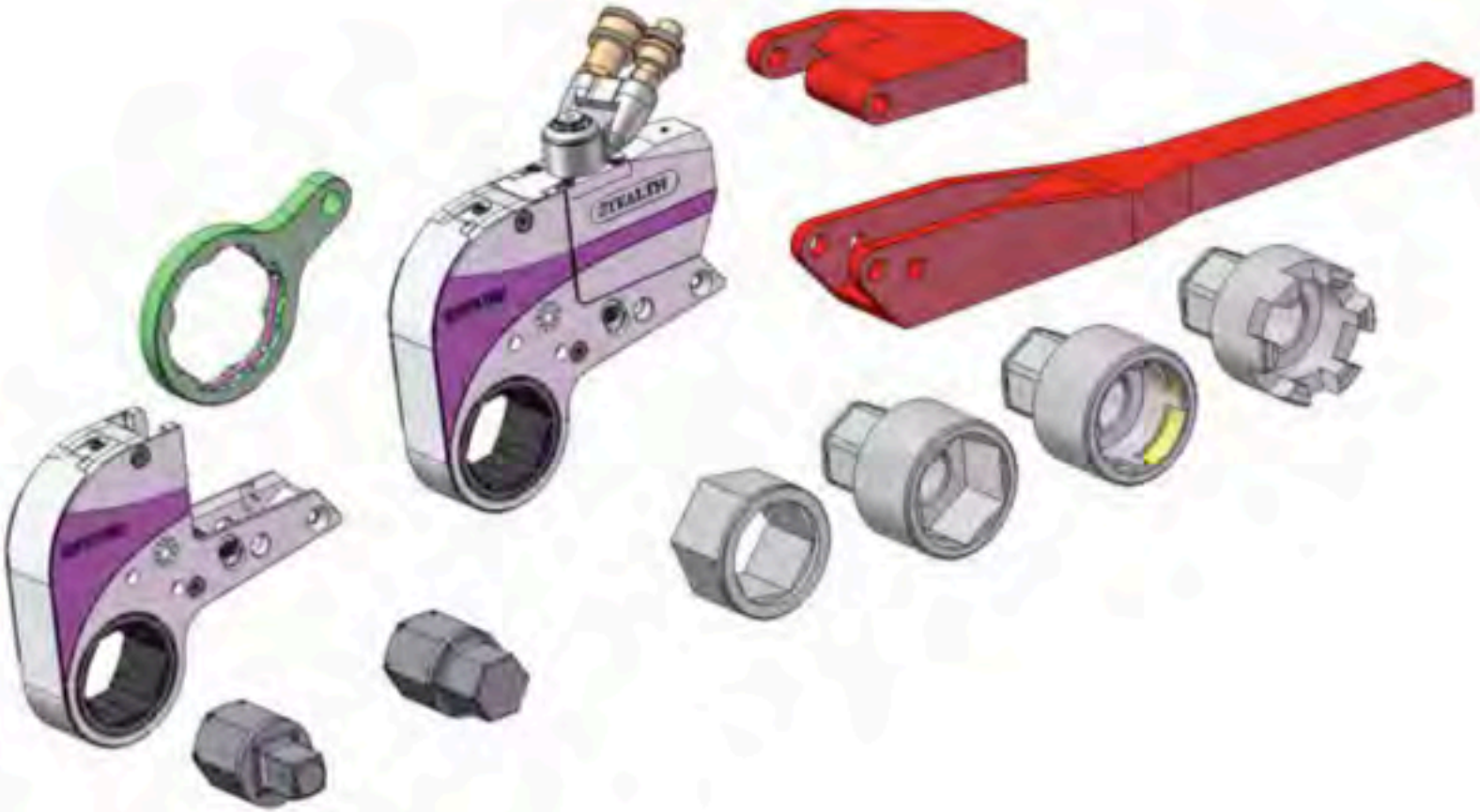

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The *ONLY* PROFESSIONALIZED BOLTING COMPANY IN PAKISTAN