

Running Procedure

VArroughneck[®]

Rev.: 6

VArroughneck[®]

RS-RP-VAR-1 Rev.6: Downhole rotation on page 11

Table of Content

- Table of Content
 - VArOUGHneck®
 - Technical data sheet
 - Running and handling
 - Downhole rotation
 - Visual inspection and field repair
 - Transportation, handling and storage

This document contains the recommended practices for the installation of voestalpine Tubulars proprietary connections. This is not comprehensive and is meant only as general guidance, based on best industry practices. Manufacturer recommendations and operational limits described herein cannot account for all potential variables in any given well which may impact casing/ connection integrity and performance.

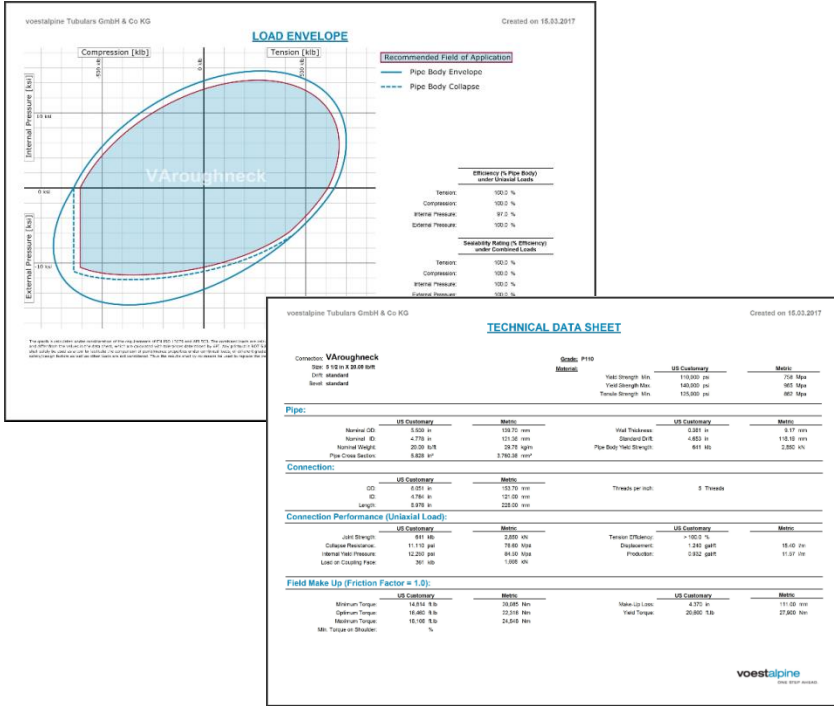
The user has the best understanding of all factors impacting well and well site operations, and therefore assumes all responsibility for the safe and effective implementation of these practices. Further, it is the user's responsibility to provide competent and knowledgeable personnel, as well as appropriate and well maintained equipment.

VArroughneck®



- VArroughneck® is designed for deviated wells, extended-reach wells and drilling-with-casing.
- **Pin-to-Pin contact** – at least twice the torque capability of API Buttress
- **Stresses** – Controlled stress distribution proven by FEA.
- **Buttress thread design** – Compatible with API Buttress.
- **Rotating of the string** – Offers the opportunity to rotate the string during installation.
- **Cementing** – Rotating during cementing leads to improved the cement bond.
- **Mechanical properties** – Tension and compression rating 100% of the pipe body

Dimensions and torque values



Dimensions and torque values will be provided through our datasheet generator:
<http://www.voestalpine.com/tubulars/en> ->
 Customer service -> Datasheet generator

- Torques are valid for dope with friction factor 1 at room temperature
- Max. torque: optimum +10%
- Min. torque: optimum -10%
- Torques for special clearance couplings on request
- Special clearance & 20° beveled couplings: slip type elevator strongly recommended due to lower load on coupling face

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ONE STEP AHEAD.

Running and handling

■ Equipment

■ Elevator

- If collar type – smooth bearing face
- If slip type – clean and sharp dies

■ Derrick

- Blocks are centered over rotary table

■ Power tong

- Correct size and calibrated
- Torque-turn monitoring system – recommended but not necessarily

■ Pipe handling

- Thread protectors in place
- No hooks to lift pipes
- No rough handling
- Use proper racks

■ Preparation

■ Cleaning

- Remove and clean protectors
- Clean pin and box

- Diesel and oil-based products are not recommended as cleaning solvent
- Prevent corrosion

■ Drifting

- Drift on pipe rack – start from box end

■ Visual inspection

- Check each pipe (see page 11)
- Apply clean and dry protectors

■ Pipe tally

■ Running

■ Lifting and stabbing

- Remove pin protectors just before stabbing
- Clean connection with compressed air
- Check for damages
- Apply thread compound – pin & box



API-modified running compound with known friction factor between 0,8 and 1,2 is recommended. Dope shall be applied uniform on pin and box (on pin including shoulder)

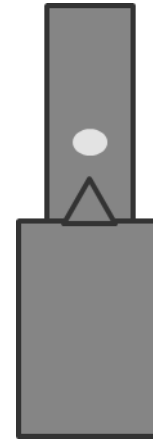
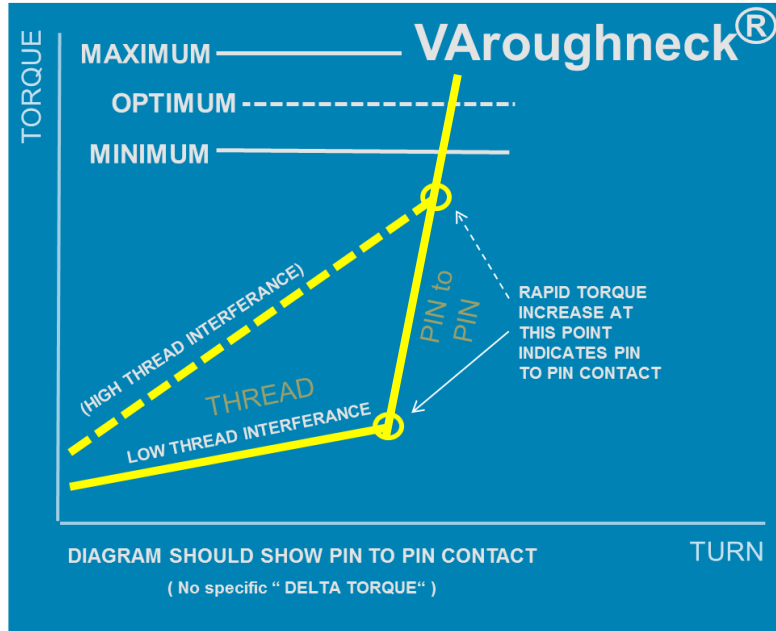
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ONE STEP AHEAD.

Running and handling

- Use a stabbing guide
- Lower carefully
- Maintain good alignment
- **Make-up**
 - Start slowly in high gear with open back-up
 - If connection jams (torque increases immediately)
 - Stop and release tong
 - Disengage connection / place back-up on coupling
 - Clean connection / visual inspection
 - If questionable - set aside
 - If o.k. – stab again
 - If connection stabs correct
 - Increase speed to spin-in (max. 25 rpm)
 - Assemble until torque increase
 - Stop rotation / close back-up
 - Finish in low gear and with speed less than 10 rpm
 - Approximately 1 to 2 turns before shouldering
- **Acceptance**
 - Final torque between maximum and minimum
 - Use correct friction factor of dope
 - Friction factor might be affected by extreme temperatures.
 - No plastic deformation
 - Increase of torque shall be reasonable uniform and smooth

Running and handling



Triangle stamp shall be used as rough indicator for the make-up progress only.

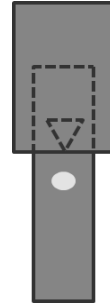
After final make-up the coupling should be close to base line (field make-up)

Running and handling

- Break-out
 - Place back up tong on coupling mill side
 - Set up power tongs to low gear
 - Speed shall be less than 10 rpm
 - Slowly lift the pin out of the box
 - Handle with care / use protectors
 - Clean all pipes
 - Visual inspection / page 11
 - Apply appropriate dope
 - Any problems during make-up or break-out should be reported immediately
 - Used equipment, thread compound, torques used, assembly speed,
 - Any questionable joint, set aside for evaluation, shall be brought to a disposition
 - Accepted or rejected
 - If rejected it must be properly marked

- “Mill-end” coupling make-up
 - Couplings to be changed have to be made-up to position

Apex of the triangle
(+/- 1,5 mm = +/- 0,06“)



- Thread lock compound
 - Pin
 - Thread lock compound shall be applied on the first two-thirds of the threads. No other compound on pin.
 - Box
 - No lock compound or dope compound on Box

Running and handling

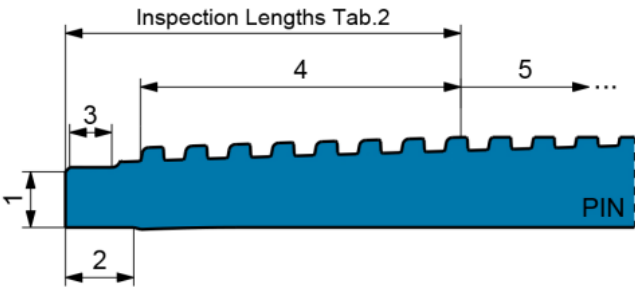
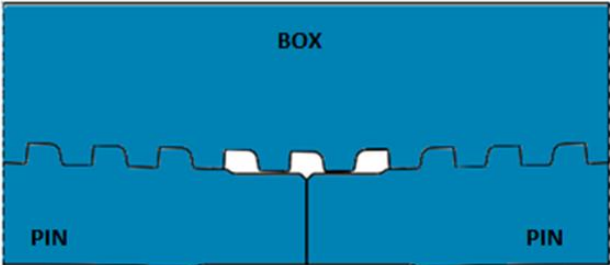
- Make-up with API Buttress (Accessories)
 - API-BTC accessory pin into VAroughneck coupling
 - Make-up to position
 - Aim for base line of the triangle stamp
- 1 turn / + 4 mm = + 0,157"
 - In case spacer rings are used : make-up to torque
VAroughneck pin in the coupling is counter rest
 - VAroughneck pin into a API-BTC accessory box
 - Make-up to position
 - Aim for base line of the triangle stamp
- 1 turn / + 6 mm = apex of triangle stamp = + 0,236"
 - No spacer rings can be used – missing counter rest

Downhole rotation

- Torque measurement equipment must be accurate
 - Dump-valve response time can vary
- If downhole rotation is required
 - User should apply the lowest amount of torque required to break friction between casing and well bore
- Max. recommended rotating torque is the max. make-up torque
 - Shall not be considered sustainable rotating torque
 - High sustained torques increase risk of momentary torque spikes which can result in connection damage
- Max. recommended rotating speed is 25 RPM
 - User should apply the lowest required RPM to break friction. As torque increases, RPM should decrease to minimize risk of connection damage
- Increase or decrease of torque or RPM should be applied gradually to
 - Allow kinetic energy to dissipate
 - Mitigate risk of connection damage

Visual inspection and field repair

- 1 Shoulder
- 2 Internal bore
- 3 Cylindrical section
- 4 Perfect thread area
- 5 Non perfect thread area



Visual inspection and field repair

Pin

Tab.1

Element	Area	Rust	Rust + Pitting	Burrs	Scratches	Dent
Shoulder	1	Remove with abrasive fleece	Grind to smooth surface with emery paper	N/A	Grind to smooth surface with emery paper	Grind to smooth surface with file and emery paper
Radius between Shoulder and Cylindrical section	1->3	Remove with abrasive fleece	Grind to smooth surface with emery paper	N/A	Grind to smooth surface with emery paper	Grind to smooth surface with file and emery paper
Edge between shoulder and bore	1->2	N/A	N/A	Remove with emery paper	N/A	Grind to smooth surface with file and emery paper
Cylindrical section	3	Remove with abrasive fleece	Remove rust with abrasive fleece. Pitting is accepted.	N/A	Accepted	Grind to smooth surface with file and emery paper
Internal bore	2	Accepted	Accepted	N/A	Accepted	Accepted
Perfect thread area (a*)	4	Remove with abrasive fleece	Grind to smooth surface with emery paper	Remove with emery paper	Accepted	Grind to smooth surface with file and emery paper
Non-perfect thread area	5	Remove with abrasive fleece	Grind to smooth surface with emery paper	Accepted	Accepted	Grind to smooth surface with file and emery paper

Tab.2

Inspection length (measured from PIN end)		
Area of visual inspection of perfect threads		
PIPE OD	mm	inch
4 1/2 "	32,76	1,29
5 "	35,93	1,41
5 1/2 "	37,52	1,48
6 "	40,70	1,60
6 5/8 "	42,28	1,66
7 "	47,03	1,85
7 5/8 "	51,81	2,04

a* Up to 2 thread-turns may be imperfect if not more than 1/4 of a turn is affected. If more than 2 thread-turns / or more than a half turn in total / are affected, hand-repair may be accepted after approval by voestalpine Tubulars specialist.

Abrasive fleece : 400 / 500 (superfine)

Emery paper : 300 - 400 (superfine)

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13 | January 8, 2025 | Running Procedure VAroughneck® - Rev.: 6

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ONE STEP AHEAD.

Visual inspection and field repair

Box

Tab.3

Element	Rust	Rust + Pitting	Burrs	Scratches	Dent
Shoulder (a*)	Remove with abrasive fleece	Change coupling	N/A	Minor accepted	Change coupling
Perfect thread length (b*)	Remove with abrasive fleece	Change coupling	Remove with emery paper	Accepted	Change coupling
Non-perfect thread length	Remove with abrasive fleece	Minor pitting, after removal of rust with abrasive fleece, is acceptable	Accepted	Accepted	Accepted

a* This is only for accessories

b* Up to 4 thread-turns may be imperfect if not more than ½ of a turn is affected. If more than 4 thread-turns / or more than 2 in total are affected, hand-repair may be accepted after approval by voestalpine Tubulars specialist

General : The phosphated surface shall not be removed by hand repair (except area 3,4 and 5). If removed, it can be accepted after approval by voestalpine Tubulars specialist and application of phosphate spray. It is also recommended that after repair Molydisulfide spray should be applied (*pin and box).

Transportation, Handling and Storage

(as recommended by API 5C1)

■ Transportation

- Load pipe on bolsters and tie down with suitable chains or straps at the bolsters
- Load pipe with all couplings on the same end of the truck
- Do not overload the truck

■ Handling

- Before loading or unloading thread protectors should be in place
- Do not unload pipe by dropping
- Avoid rough handling which might damage the threads or the body of the pipe
- When rolling pipe, on the rack, keep pipe parallel and do not allow pipe to strike the ends
- Do not use hooks to lift pipes

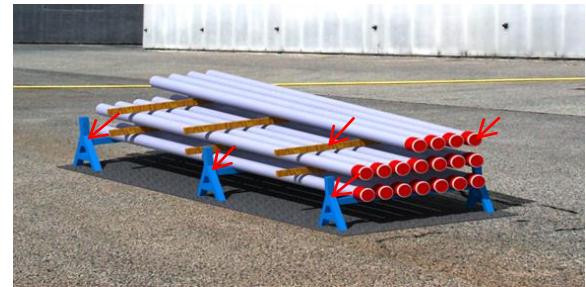
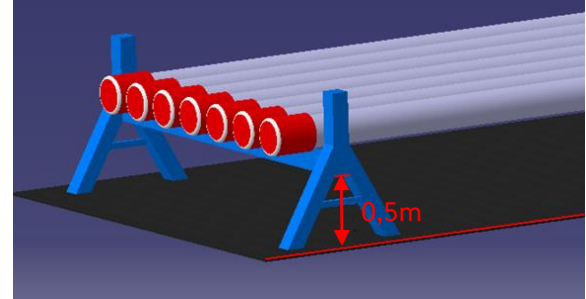


Transportation, Handling and Storage

(as recommended by API 5C1)

■ Storage

- At least every six months some of the pin and box thread protectors should be removed at random and the threads should be checked for corrosion
- First tier of pipes should be no less than 1,5 feet's (approximately 0,5m) from the ground
- Pipes should properly rest on supports to prevent bending and damages
- Between the successive layers of pipes you should provide wooden strips as separators
- Do not stack pipes higher than three meters
- Only use thread protectors that correspond to the threaded pin/box ends
- Do not mix different pipes in the stack
- All protectors must be secured and should have no damage.



Thank you

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www.voestalpine.com/tubulars

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ONE STEP AHEAD.