

Running Procedure

VAGT®

Rev.:5

VAGT®

RS-RP-VAGT-1 Rev.5: Updated requirements for DryTec-installations on page 10 &
11

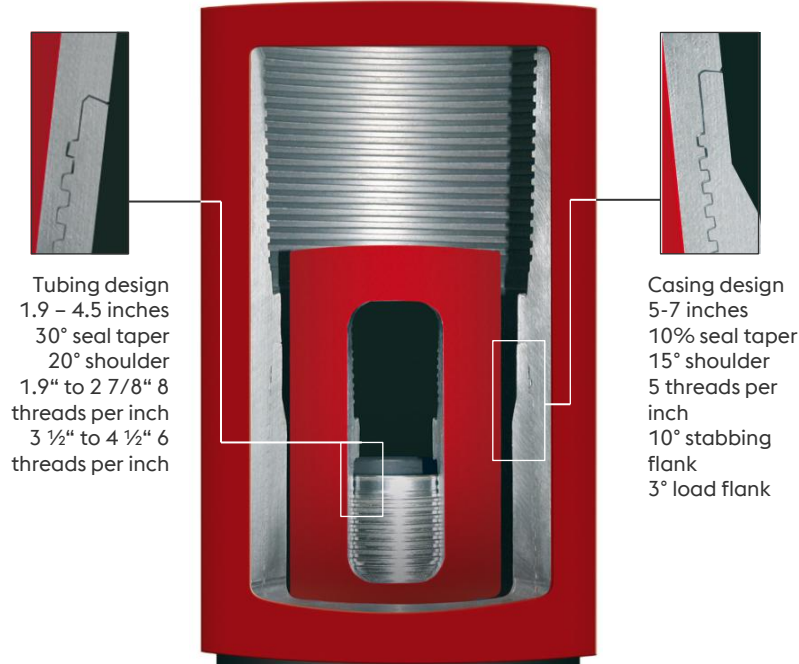
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This document contains the recommended practices for the installation of voestalpine tubulars proprietary connections. This is not comprehensive and is meant only as general guidance, based on best industry practices.

The user 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.

VAGT®



- VAGT® is field approved by millions of successfully installed feet
- **Gas tight thread connection**
- **Metal to Metal Seal** – The high contact pressure in the seal area ensures 100% gas tightness
- **Internal Shoulder** – Reinforces the contact pressure in the seal area and acts as a positive make-up stop.
- **Improved Buttress Thread design** – The thread design ensures a high stress performance and allows easy make-up even under severe condition.
- **Smooth Internal Profile** – Minimizes turbulence and also provides good conditions for internal plastic coating.

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Created on 15.03.2017

LOAD ENVELOPE

The graph displays the Load Envelope for VASuperior pipe, plotting Internal Pressure (ksi) and External Pressure (ksi) against Compression (kib) and Tension (kib). The envelope is defined by a solid blue line for the Pipe Body Envelope and a dashed blue line for the Pipe Body Collapse. The VASuperior logo is prominently displayed in the center of the envelope.

Recommended Field of Application

- Pipe Body Envelope
- - - Pipe Body Collapse

Efficiency (% Pipe Body) under Uniaxial Loads

The graph is valid under consideration of the load envelope of EN 10217-2 and API 5L. The envelope limits are indicated without the joint and after their the reduction by the data table, when a connection with the joint is required by API. The graph is NOT SUITABLE TO MINUS 50 °C, about which the user can be contacted the company for performance properties in that temperature range. At certain conditions, when the recommended application limits are used, the effect of the temperature is not to be taken into account to improve the operating limits resulting.

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TECHNICAL DATA SHEET

Connection: **VASuperior**

Size: 5 1/2 in x 30.00 in
 Unit: standard
 End: standard

Grade: L80-1

Material:

Pipe:

	US Customary	Metric
Nominal OD	5.500 in	139.70 mm
Nominal ID	4.778 in	121.38 mm
Nominal Weight	20.50 lb/m	30.12 kg/m
Pipe Section Mod.	5.828 in ⁴	2.702 dm ⁴

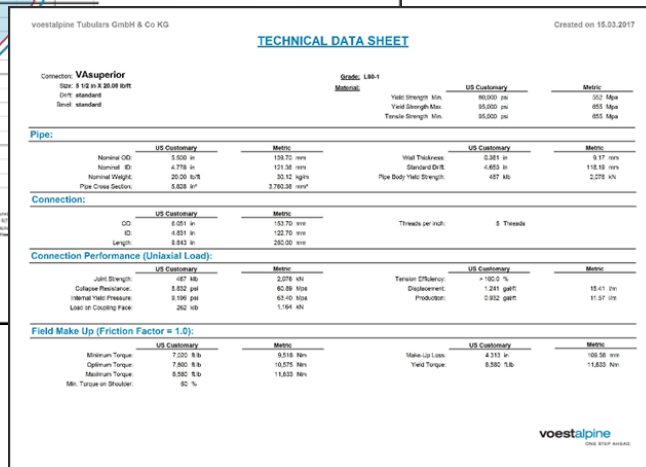
Connection:

	US Customary	Metric
OD	5.051 in	128.70 mm
ID	4.531 in	112.70 mm
Length	5.840 in	285.00 mm

Connection Performance (Uniaxial Load):

	US Customary	Metric
Joint Strength	487 kN	2.078 kN
Collapse Resistance	5.832 psi	60.58 MPa
Internal Yield Pressure	5.196 psi	62.40 MPa
Load or Coating Face	262 in	1.164 in

<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 +15%
- 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

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

■ 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

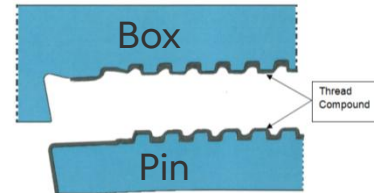
- Check each pipe (see page 12)
- Apply clean and dry protectors

■ Pipe tally

■ Running

■ Lifting and stabbing

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



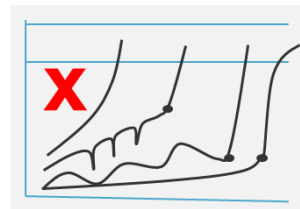
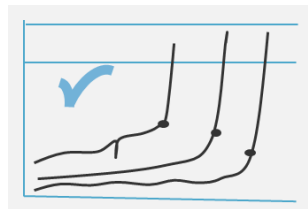
API-modified running compound with known friction factor between 0,8 and 1,2 is recommended. Dope shall be applied uniform on pin and box (on pin including seal and shoulder)

Running and handling

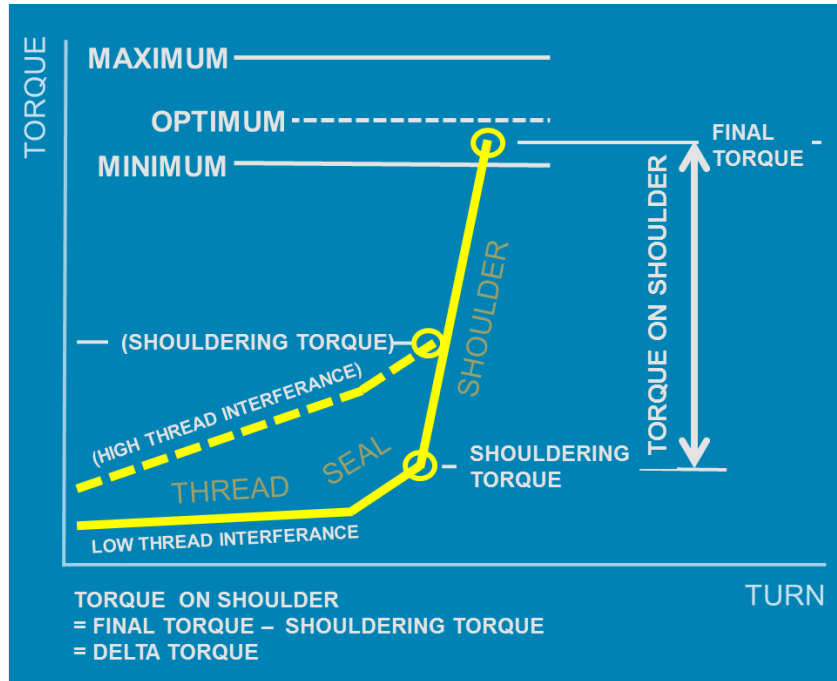
- Use a stabbing guide
- Lower carefully until pipe fully landed inside of the box
- Maintain good alignment
- **Make-up**
 - Start slowly in high gear with open back-up
 - If connection jams (torque increases immediately)
 - Stop and release tong
 - Disengage connection / place back-up on coupling
 - Clean connection / visual inspection
 - If questionable - set aside
 - If o.k. – stab again
 - If connection stabs correct
 - Increase speed to spin-in (max. 20 rpm)
 - Assemble until torque increase
 - Stop rotation / close back-up
 - Finish in low gear and with speed less than 5 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.
- Delta torque shall be at least 30 % of minimum recommended torque as per Datasheet
 - See diagram on page 8
- No plastic deformation
- Increase of torque shall be reasonable uniform and smooth

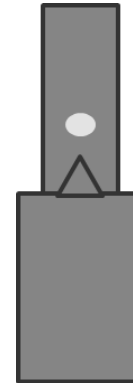


Running and handling



Casing and tubing

Torque on shoulder (delta torque) shall be at least 30 % of minimum recommended torque as per Datasheet



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.

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 12
 - 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
- High chrome material
 - Handling
 - Avoid metal to metal contact
 - Equipment
 - Use non ferrous low marking dies
 - Use weight compensator
 - Use non metallic drift
 - No misalignment
 - Make-up
 - Start make-up by hand
 - Maximum assembly speed 10 rpm
 - Final make-up speed max. 5 rpm
- 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 thread lock compound on threads. On seal and shoulder running compound shall be applied.

DryTec®

- For DryTec only
 - No special equipment requested
 - Clean with compressed air
 - Standard drift procedure
 - Visual inspection
 - Check each pipe (see page 12)
 - Apply clean and dry protectors. Always use original protectors.
 - No special running procedure except :
 - No application of dope
 - Pipes shall not be rotated during lowering into the box
 - Extreme temperature will affect friction
 - Optimum torque at specific temperatures will be calculated as follow : Optimum torque from data sheet (at 20°C/68°F) x temperature related friction factor
 - Friction factor as per table on page 11.
 - High shoulder connections
 - Job-specific conditions but also the coating ingredients might affect the make-up graphs
- If required, torques can be gradually increased until consistent minimum delta torque as specified on page 8 is achieved
- Torques can be increased up to 20% above max. recommended make-up torque as per Datasheet
 - Only if it is necessary to achieve the required delta-torque because of high thread-torque (high-shoulder connections)
- No plastic deformation shall be visible on any make-up graph.
- The delta torque shall always be 30% of the minimum recommended make-up torque as per Datasheet – even if the final make-up torque is increased and above max. recommended make-up torque as per Datasheet
- Accessories
 - If a DryTec pin is made-up with regular box : Apply dope on box
 - If a DryTec box is made up with a regular pin: Apply dope on pin and box

For DryTec only

Temperature		Friction factor (related)
-40°C to -15°C	-40°F to +5°F	1,28
-15°C to +10°C	+5°F to +50°F	1,13
+10°C to +35°C	+50°F to +95°F	1,00
+35°C to +60°C	+95°F to +140°F	0,84

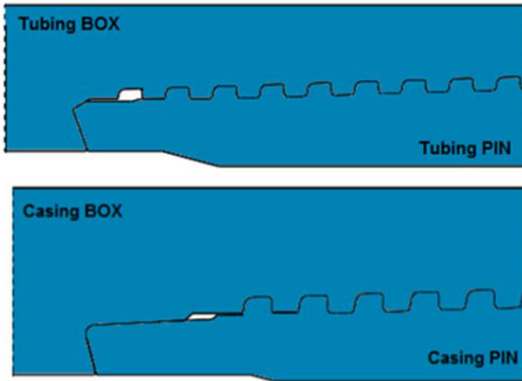
Torque/Turn monitoring is required to properly ensure correct make-up of each connection with DryTec.

The friction factors provided above are for guidance only and cannot represent all scenarios. To prevent yielding (plastic deformation), it is recommended to start at extreme temperatures with the minimum torque value to determine how the job-specific conditions are affecting the make-up.

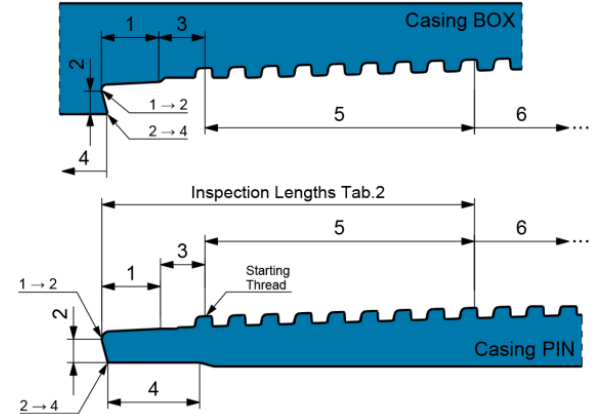
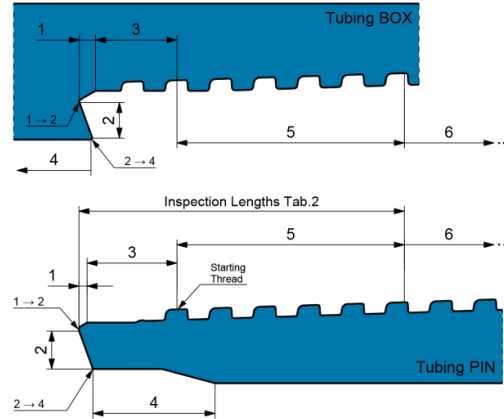
Make-up acceptance shall always be determined based on the criteria outlined on pages 7 - 10.

Visual inspection and field repair

- 1 Seal
- 2 Shoulder
- 3 Cylindrical section
- 4 Internal bore
- 5 Perfect thread area
- 6 Non perfect thread area
- 7 Coupling face *



* not shown in sketch



Visual inspection and field repair

Pin

Tab.1

Element	Area	Rust	Rust + Pitting	Burrs	Scratches	Dent
Seal (a*)	1	Remove with abrasive fleece	Re-cut the pin	N/A	Minor remove with abrasive fleece	Re-cut the pin
Shoulder	2	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 seal and shoulder	1->2	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	2->4	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	4	Accepted	Accepted	N/A	Accepted	Accepted
Perfect thread area (b*)	5	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	6	Remove with abrasive fleece	Grind to smooth surface with emery paper	Accepted	Accepted	Grind to smooth surface with file and emery paper

a* Minor pitting, dents or scratches may be accepted after approval by voestalpine Tubulars specialist

b* Up to 2 thread-turns may be imperfect if not more than ¼ 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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Tab.2

Inspection length (measured from Pin End) Area of visual inspection of perfect threads		
PIPE OD	mm	inch
2 3/8 "	20,2	0,80
2 7/8 "	27,2	1,07
3 1/2 "	36,8	1,45
4 "	42,2	1,66
4 1/2 "	46,6	1,83
5 "	50,9	2,00
5 1/2 "	52,9	2,08
5 3/4 "	54,9	2,16
6 5/8 "	58,2	2,29
7 "	62,9	2,48

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ONE STEP AHEAD.

Visual inspection and field repair

Box

Tab.3

Element	Area	Rust	Rust + Pitting	Burrs	Scratches	Dent
Seal (a*)	1	Remove with abrasive fleece	Change coupling	N/A	Change coupling	Change coupling
Shoulder (a*)	2	Remove with abrasive fleece	Change coupling	N/A	Minor accepted	Change coupling
Radius between seal and shoulder	1->2	Remove with abrasive fleece	Change coupling	N/A	Minor accepted	Change coupling
Edge between shoulder and bore	2->4	N/A	N/A	Remove with emery paper	N/A	Change coupling
Cylindrical section	3	Remove with abrasive fleece	Remove rust with abrasive fleece. Pitting is accepted.	N/A	Accepted	Change coupling
Internal bore	4	Accepted	Accepted	N/A	Accepted	Accepted
Perfect thread area (b*)	5	Remove with abrasive fleece	Change coupling	Remove with emery paper	Accepted	Change coupling
Non-perfect thread area	6	Remove with abrasive fleece	Minor pitting, after removal of rust with abrasive fleece, is acceptable	Accepted	Accepted	Accepted
Coupling face	7	Accepted	Accepted	Accepted	Accepted	Accepted

a* Minor pitting, dents or scratches may be accepted after approval by voestalpine Tubulars specialist

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 and/or DryTec-coated surface shall not be removed excessively by hand – repair (except area 3,4 and 7. Minor removal is acceptable as it is.

Heavier removal can be accepted after approval by voestalpine Tubulars specialists. Phosphate and/or corrosion protection spray should be applied (time for drying shall be given).

This is as well applicable for the DryTec Pin

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

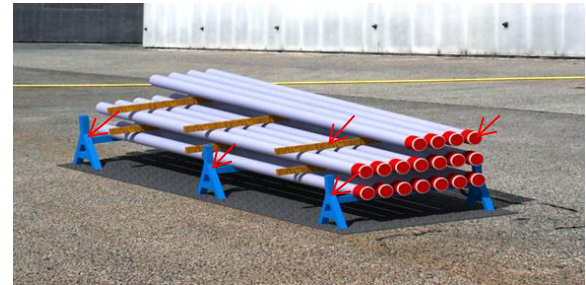
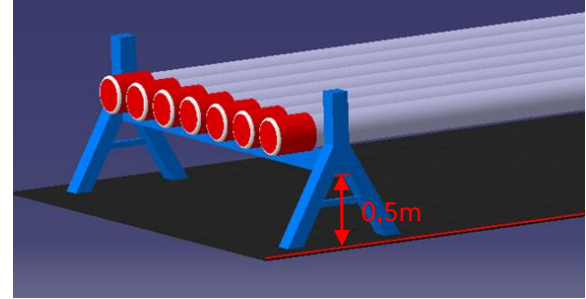
- Before loading or unloading thread protectors should be in place
- Do not unload pipe by dropping
- Avoid rough handling which might damage the threads or the body of the pipe
- When rolling pipe, on the rack, keep pipe parallel and do not allow pipe to strike the ends
- Do not use hooks to lift pipes



Transportation, Handling and Storage

■ 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. DryTec® protectors shall be checked for proper tightness (hand tight) when put pipes into storage and at least each 3 months during storage



Thank you

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www.voestalpine.com/tubulars

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ONE STEP AHEAD.