

Running Procedure

VAsuperior®

Rev.7

VAsuperior®

RS-RP-VAS-1 Rev.7 : Updated requirements for acceptance criteria and break outs

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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.

VAsuperior®



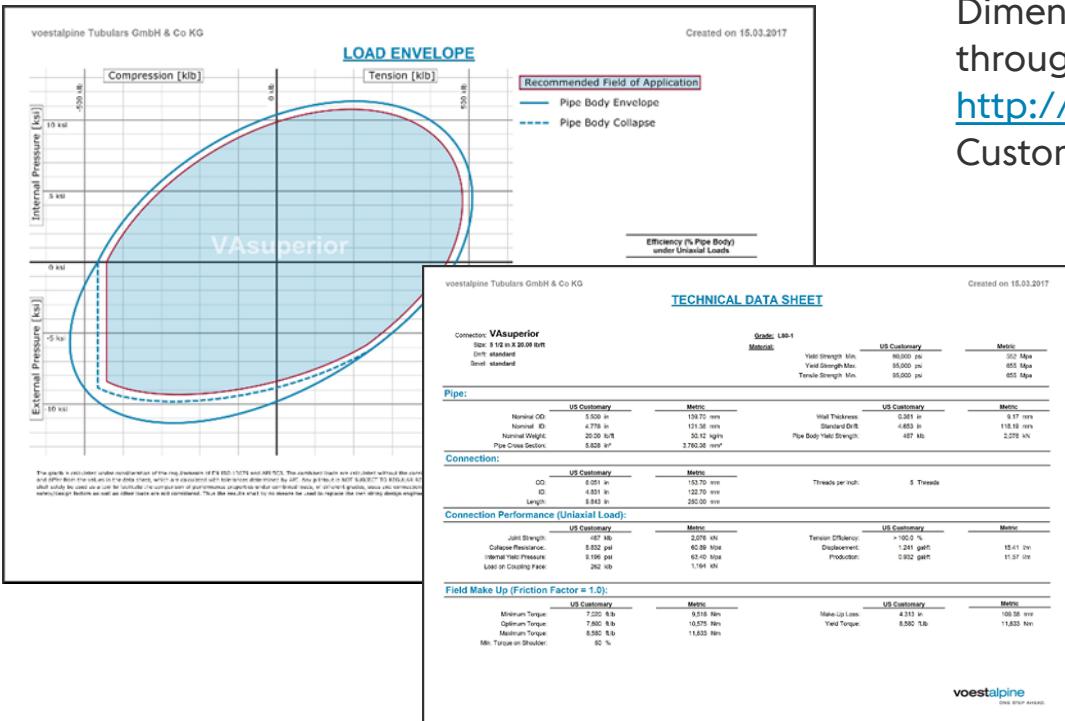
Tubing design
2 3/8 – 4 1/2 inches
50% seal taper
7.5° shoulder
2 3/8" to 2 7/8"
8 threads per inch
3 1/2" to 4 1/2"
6 threads per inch
10° stabbing flank
3° load flank



Casing design
5 – 7 inches
10 % seal taper
15° shoulder
5 threads per inch
10° stabbing flank
3° load flank

- VAsuperior® is designed to meet the toughest conditions.
- **Metal to metal seal** – The optimal 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.
- **Optimized buttress thread design** – The thread design allows easy and fast make-up in the most severe conditions.
- **Smooth internal profile** – The internal flush profile minimizes turbulences.
- **Position of seal area** – The distance from the pin face provides improved protection against transport, handling and – almost all – installation damages.
- **Clearance** – The recess before and after the seal area is a lubricant reservoir where excess thread compound is forced to prevent a pressure build up due to trapped and compressed thread compound.

Technical data sheet

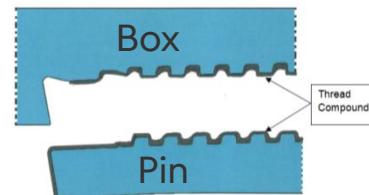


Dimensions and torque values will be provided through our datasheet generator:
<http://www.voestalpine.com/tubulars/en> ->
Customer service -> Datasheet generator

- 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 and 20° beveled couplings: slip type elevator strongly recommended due to lower load on coupling face
- For any special case, please contact voestalpine Tubulars specialists for assistance

Running and handling

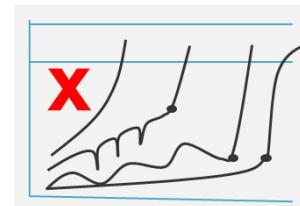
- Equipment
 - Elevator
 - If collar type – smooth bearing face
 - If slip type – clean and sharp dies
 - Derrick
 - Blocks are centered over rotary table
 - Power tong
 - Correct size and calibrated
 - Torque-turn monitoring system
- Pipe handling
 - Thread protectors in place
 - No hooks to lift pipes
 - 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 carefully from box end
- Visual inspection
 - Check each pipe (see page 13-15)
 - 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



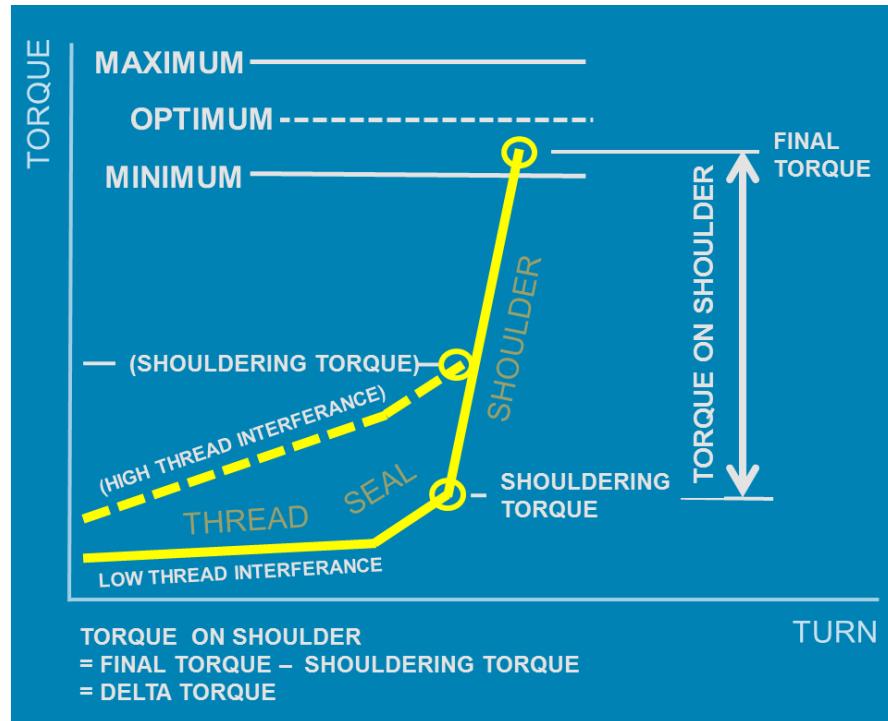
API-modified running compound with known friction factor between 0,8 and 1,2 is recommended. Dope shall be applied uniform on pin and box (on pin including seal and shoulder)

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
 - Proceed as described under Break-out if 30% delta torque couldn't be achieved
 - No plastic deformation
 - Increase of torque shall be reasonable uniform and smooth

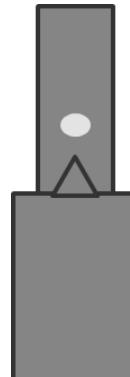


Running and handling



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 pin and box
 - Visual inspection / page 13
 - Prepare for the re-run as described under Make-up
 - Only, if no mechanical damages are visible or, if mechanical damages can be repaired, which shall be done before the re-run
 - Apply thread compound – pin & box
 - If make-up graph is still not acceptable
 - Proceed as described under Break-out
 - Maximal 2 re-runs allowed
 - After 2nd re-run, pipes shall be set aside for further investigation
- 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

Running and handling

- High chromium 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 – straplock can be used
 - 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 13-15)
 - 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 12.
 - 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
 - Start of the first increase only if 8 out of 10 make-up shows consistent high-shoulder connections
- Torques can be increased up to 20% above maximum 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

Material 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

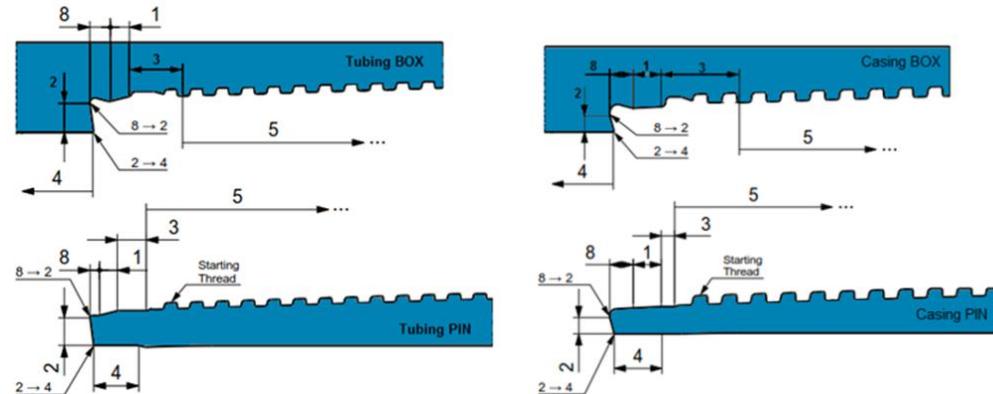
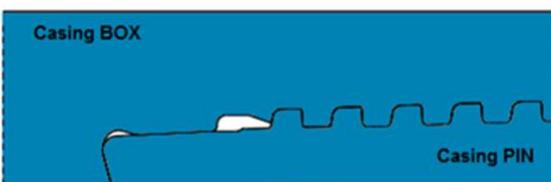
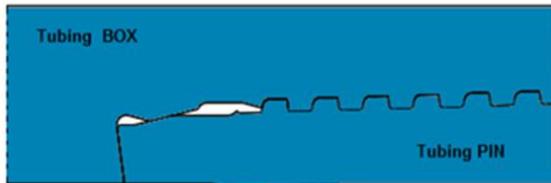
Torque/Turn monitoring is required to properly ensure correct make-up of each connection with DryTec®.

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 length
- 6 Non perfect thread length *
- 7 Coupling face *
- 8 Clearance



* not shown in sketch

Visual inspection and field repair

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 length (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 length	6	Remove with abrasive fleece	Grind to smooth surface with emery paper	Accepted	Accepted	Grind to smooth surface with file and emery paper
Clearance area	8	Remove with abrasive fleece	Remove rust with abrasive fleece. Pitting is accepted.	N/A	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 $\frac{1}{4}$ 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.

Pin

PIPE OD	"Perfect Thread Length "(measured from Pin End)	
	mm	inch
2 3/8 "	21,71	0,855
2 7/8 "	27,45	1,081
3 1/2 "	40,07	1,578
4 "	45,21	1,780
4 1/2 "	56,15	2,211
5 "	49,00	1,929
5 1/2 "	51,00	2,008
5 3/4 "	52,04	2,049
6 5/8 "	55,36	2,180
7 "	60,04	2,364
7 5/8 "	65,28	2,570

Abrasive fleece : 400 / 500 (superfine)

Emery paper : 300 -400 (superfine)

Visual inspection and field repair

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 length (b*)	5	Remove with abrasive fleece	Change coupling	Remove with emery paper	Accepted	Change coupling
Non-perfect thread length	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
Clearance	8	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 $\frac{1}{2}$ 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

Box

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

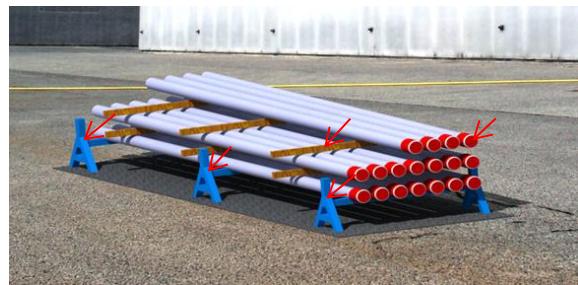
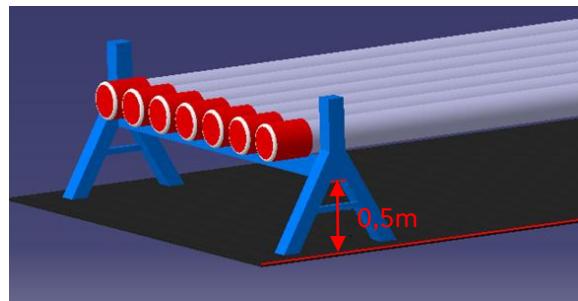
- Before loading or unloading thread protectors should be in place
- Do not unload pipe by dropping
- Avoid rough handling which might damage the threads or the body of the pipe
- When rolling pipe, on the rack, keep pipe parallel and do not allow pipe to strike the ends
- Do not use hooks to lift pipes



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