

Running Procedure

VAGT®

Rev.:2

VAGT®

RS-RP-VAGT-1 Rev.2: Change on page 15 (note to field repair table)

Table of Content

- Table of Content
 - Proprietary connections
 - Proprietary grades
 - VAGT®
 - Technical data sheet
 - Running and handling
 - DryTec®
 - 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.

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.

Proprietary Connections

Fields of application		VAGT		VAsuperior		VExplorer	VArroughneck
		Casing	Tubing	Casing	Tubing	Casing	Casing
CAL		*	II	IV	IV	IV	I
Efficiency (% of pipe body) {Uniaxial Loads}	Tension	100**		100	100	100	100
	Compression	100**		100	100	100	100
	Internal pressure	100		100	100	100	100
	External pressure	100		100	100	100	100
Sealability (% of efficiency) {Combined Loads}	Tension	100		100	100	100	100
	Compression	50 (for fluids: 100)		100	100	100	100
	Internal pressure	100		100	100	100	100
	External pressure	30 (for fluids: 100)		100	100	100	100
Conditions of combined load tests	Medium	GAS		GAS	GAS	GAS	FLUID
	Von mises (%)	95		95	95	95	95
	Bending	20		20	20	20	20
Applications	High torque	NO		NO***	N.A.	YES	YES

* tested acc. to customer specifications
 ** exception for heavy walls
 *** on request enhanced torque available

Visit www.voestalpine.com/tubulars for detailed information

Proprietary Grades

SPECIFIED MINIMUM YIELD STRENGTH	GRADE API SPEC 5CT	voestalpine Tubulars Proprietary Grades										
		HIGH COLLAPSE	ENHANCED PROPERTIES	EXTREME PROPERTIES	SOUR SERVICE			DEEP WELL		MILD SWEET GAS		
					with high collapse	with enhanced properties		with high collapse	Low Temperature	Ferrite Pearlite	Quenched & Tempered	
psi												
55 000	J55 K55	VA-HC-J55 VA-HC-K55								VA-LT-J55 VA-LT-K55	VA-FP-55-1CR	
75 000											VA-FP-75-1CR	
80 000	N80-Q L80-1	VA-HC-N80-Q VA-HC-L80-1	VA-EP-N80-Q VA-EP-L80-1	VA-XP-N80-Q VA-XP-L80-1						VA-LT-N80-Q VA-LT-L80-1	VA-FP-80-1CR	VA-L80-1-1CR / VA-L80-1-3CR
90 000	C90-1	VA-HC-C90-1	VA-EP-C90-1	VA-XP-C90-1	VA-SS-80 VA-SS-90	VA-SS-80-HC VA-SS-90-HC	VA-SS-80-EP VA-SS-90-EP			VA-LT-C90-1		
95 000	R95 T95-1	VA-HC-R95 VA-HC-T95-1	VA-EP-R95 VA-EP-T95-1	VA-XP-R95 VA-XP-T95-1	VA-SS-95	VA-SS-95-HC	VA-SS-95-EP			VA-LT-R95 VA-LT-T95-1		
110 000	C110 P110	VA-HC-C110 VA-HC-P110	VA-EP-C110 VA-EP-P110	VA-XP-P110	VA-SS-110 VA-S-110	VA-SS-110-HC VA-S-110-HC	VA-SS-110-EP VA-S-110-EP			VA-LT-C110 VA-LT-P110		VA-P110-1CR / VA-P110-3CR
125 000	Q125-1	VA-HC-Q125-1	VA-EP-Q125-1	VA-XP-Q125-1	VA-S-125	VA-S-125-HC	VA-S-125-EP	VA-D-125	VA-D-125-HC	VA-LT-Q125-1		
140 000								VA-D-140	VA-D-140-HC			
150 000								VA-D-150	VA-D-150-HC			

On request in combination with:

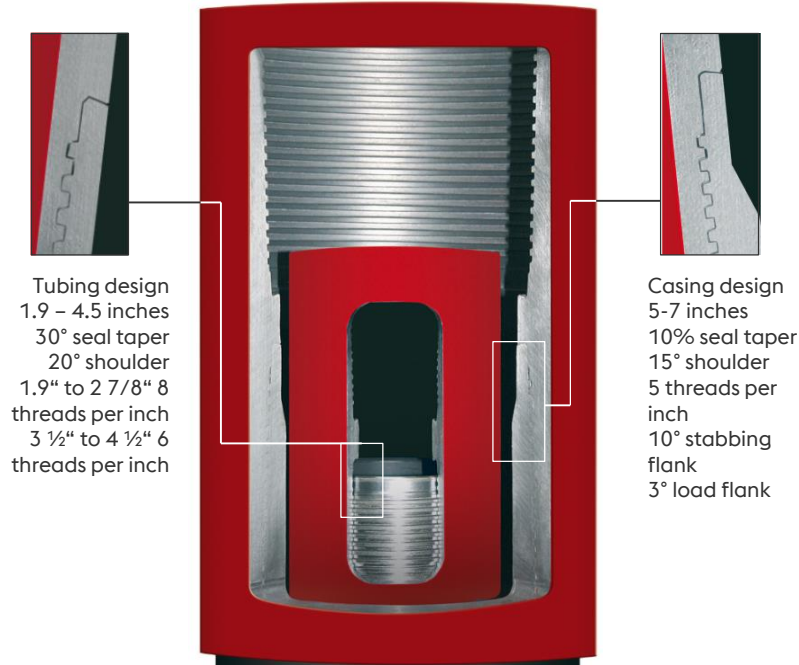
LOW TEMPERATURE

HIGH COLLAPSE

Enhanced/Extreme Properties

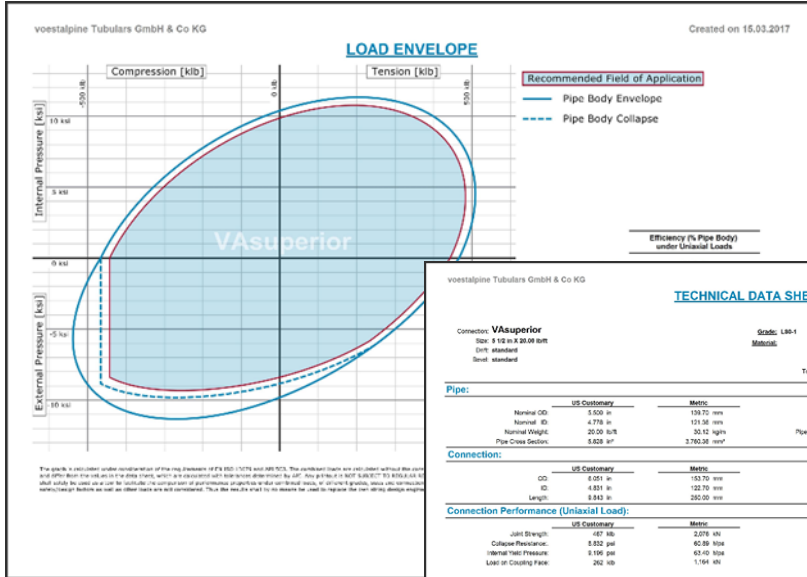
Visit www.voestalpine.com/tubulars for detailed information

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.

Technical data sheet



voestalpine Tubulars GmbH & Co KG **TECHNICAL DATA SHEET** Created on 15.03.2017

Connector: **VASuperior** Grade: L80-1 Material: US Customary Metric

Size: 8.12 in x 20.00 lbm Yield Strength Min: 80,000 psi 552 MPa
 ERT standard Tensile Strength Min: 95,000 psi 655 MPa
 Steel standard Tensile Strength Min: 95,000 psi

Pipe:

	US Customary	Metric	US Customary	Metric
Nominal OD	8.120 in	133.70 mm	Wall Thickness	4.281 in
Nominal ID	4.778 in	121.38 mm	Standard Dev	4.683 in
Nominal Weight	20.00 lbm	20.12 kg/m	Pipe Body Yield Strength	487 MPa
Pipe Cross Section	8.828 in ²	2.762 dm ²		

Connection:

	US Customary	Metric	Threads per inch	
OD	8.081 in	132.70 mm		5 Threads
ID	4.831 in	122.70 mm		
Length	8.843 in	225.00 mm		

Connection Performance (Uniaxial Load):

	US Customary	Metric	US Customary	Metric
Joint Strength	487 MPa	2,078 MPa	Tension Efficiency	> 100% %
Collaps Pressure	8,832 psi	60.89 MPa	Displacement	1,241 gal/ft
Internal Yield Pressure	8,108 psi	55.45 MPa	Production	5,932 gal/ft
Load of Cracking Face	262 MPa	1,764 MPa		

Field Make Up (Friction Factor = 1.0):

	US Customary	Metric	US Customary	Metric
Minimum Torque	7.200 ft-lb	9,818 Nm	Make Up Loss	4,313 in
Optimum Torque	7.860 ft-lb	10,675 Nm	Yield Torque	5,960 ft-lb
Maximum Torque	8.580 ft-lb	11,633 Nm		
Min. Torque on Shoulder	80 %			

voestalpine
ONE STEP AHEAD.

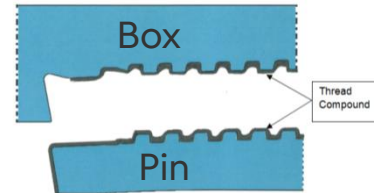
Dimensions and torque values will be provided through our datasheet generator:
<http://www.voestalpine.com/tubulars/en> ->
 Customer service -> Datasheet generator

- Torques are valid for dope with friction factor 1 at room temperature
- Max. torque: optimum +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 13)
 - 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)

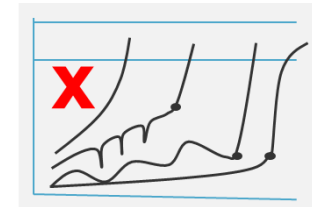
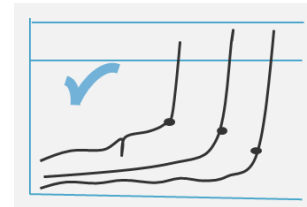
voestalpine

ONE STEP AHEAD.

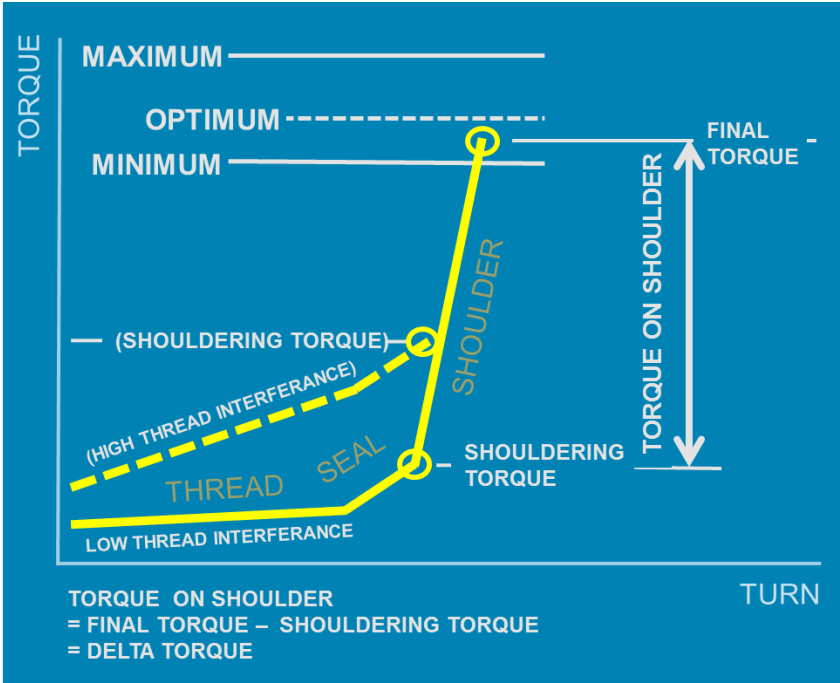
Running and handling

- 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. 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 actual applied torque
 - See diagram on page 10
 - No plastic deformation
 - Increase of torque shall be reasonable uniform and smooth

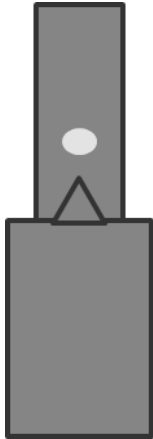


Running and handling



Casing and tubing

Minimum 30 % torque on shoulder (Delta torque).



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 13
 - 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.

- For DryTec only
 - No special equipment requested
 - Clean with compressed air
 - Standard drift procedure
 - Visual inspection
 - Check each pipe (see page 13)
 - Apply clean and dry protectors. Always use original protectors.
 - No special running procedure except : No application of dope
 - 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
 - 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

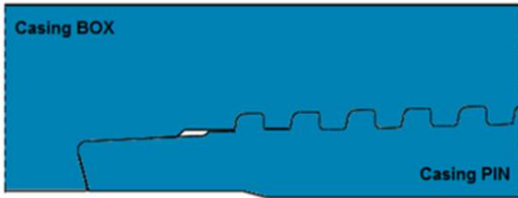
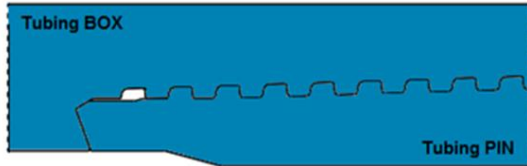
Torque/Turn monitoring is required to properly ensure correct make-up of each connection with DryTec.

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. If required, torques can be gradually increased until consistent minimum delta torque as specified is achieved.

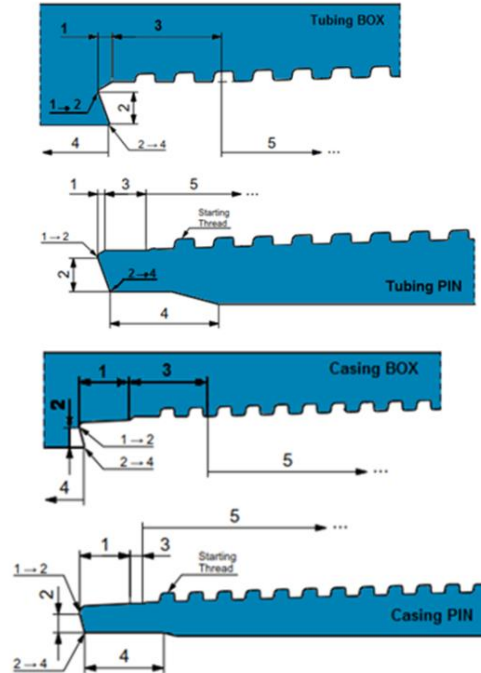
Make-up acceptance shall always be determined based on the criteria outlined on pages 8 and 9.

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 *



* 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

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)

voestalpine Tubulars GmbH & Co KG

14 | July 25, 2018 | Running Procedure – VAGT® - Rev.:2

Pin

"Perfect Thread Length " (measured from Pin End)		
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

voestalpine

ONE STEP AHEAD.

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

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

voestalpine Tubulars GmbH & Co KG

15 | July 25, 2018 | Running Procedure – VAGT® - Rev.:2

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

voestalpine

ONE STEP AHEAD.

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

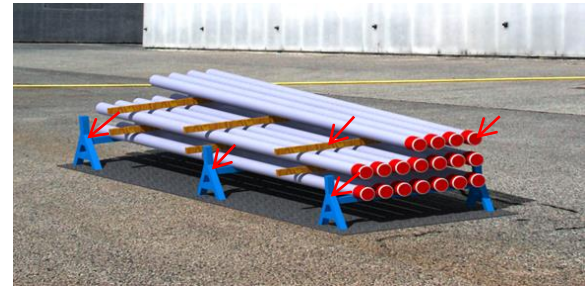
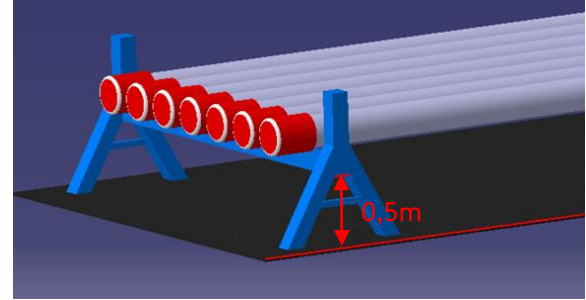
- Before loading or unloading thread protectors should be in place
- Do not unload pipe by dropping
- Avoid rough handling which might damage the threads or the body of the pipe
- When rolling pipe, on the rack, keep pipe parallel and do not allow pipe to strike the ends
- Do not use hooks to lift pipes



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

voestalpine Tubulars GmbH & Co KG
www.voestalpine.com/tubulars

voestalpine
ONE STEP AHEAD.