

26  
28  
14  
2

Atomic Number → 101  
Symbol → Mn  
Name → Manganese  
Atomic Weight → (54.94)  
Electrons per shell → 2

28  
28  
16  
2

Atomic Number → 28  
Symbol → Ni  
Name → Nickel  
Atomic Weight → 58.69  
Electrons per shell → 2

42  
42  
18  
2

Atomic Number → 42  
Symbol → Mo  
Name → Molybdenum  
Atomic Weight → 95.95  
Electrons per shell → 2

24  
24  
13  
2

Atomic Number → 24  
Symbol → Cr  
Name → Chromium  
Atomic Weight → 51.996  
Electrons per shell → 2

**PROPRIETARY GRADES**

**Our passion is your success**

tion of the requirements of EN ISO 13679 and API 5CS. The combined loads are calculated without the consideration of wall thickness tolerances  
 next, which are calculated with tolerances determined by API. Any product is NOT SUBJECT TO REGULAR REVISION. The generated performance envelope  
 comparison of performance properties under combined loads, of different grades, sizes and connections of voestalpine Tubulars products. Field-specific  
 intended. Thus, the results shall by no means be used to replace the own design engineering or to justify any warranty/purity cases.



# PERFORMANCE IN TUBULARS

Our world is based on high tech seamless pipes that can withstand the toughest conditions, day in, day out. We promise highest performance based on the core values customization, innovation, sustainability and responsibility.



CUSTOMIZATION



INNOVATION



SUSTAINABILITY



RESPONSIBILITY

# PRODUCTION, R&D, SALES LOCATIONS AND LICENSEES



Find your closest contact:  
[www.voestalpine.com/tubulars/en/Contact/sales/](http://www.voestalpine.com/tubulars/en/Contact/sales/)



Follow us  
on social Media!



# PRODUCT CHARACTERISTICS & CUSTOMER BENEFITS

## YOUR REQUIREMENT » OUR SOLUTION

voestalpine Tubulars Proprietary Grades offer benefits which are not addressed by the API specification or exceed the API standards. Also tailor-made customer specifications can be fulfilled upon request.

## FROM DEVELOPMENT TO FINAL PRODUCT » GET EVERYTHING FROM ONE SOURCE

With your decision for voestalpine Tubulars, you get support from material and product selection, in-house material and product development, to final product and installation consulting from one source.

## DEMANDING APPLICATIONS » UP-TO DATE PRODUCTS

To optimize the technical features of products for the oil and gas industry, the latest advancements in production and inspection coupled with the newest developments in drilling and completion technology are considered in the most severe conditions.

# TESTING FACILITIES

If a product solution is not readily available for you, voestalpine Tubulars can help you to develop it in-house - from material composition to final product.

## NEW PRODUCT DEVELOPMENT REQUEST FROM OUR CUSTOMER



METLAB



MATERIAL COMPOSITION

TECHMET



TUBULARS TESTING FACILITIES



TESTING & FINE TUNING  
TOGETHER WITH METLAB & TECHMET



FINAL TESTING &  
APPROVAL OF PRODUCT



# OVERVIEW

## Our tools in manufacturing the VA series include but are not limited to

- » Steel with special chemical composition
- » Unique melting, refining and casting practices
- » Controlled processes in the pipe rolling, heat treatment, straightening and end finishing operations
- » Tighter tolerances
- » Restricted mechanical properties
- » Special testing and inspection methods

Some of the product names explain the application, e.g. deep well, sour service, low temperature.

### The applications for other grades are defined as follows:

- » **VA-High Collapse-Series**  
for use in high external pressure environments
- » **VA-Mild Sweet Gas-Series**  
for mildly corrosive environments where – in combination with an adequate inhibition program – a higher corrosion resistance can be expected compared to regular API grades

Specified Minimum Yield Strength [psi]	Grade API Spec 5CT	HIGH COLLAPSE	ENHANCED PROPERTIES
		Page 8	Page 13
55,000	J55		
	K55		
75,000			
80,000	N80-Q	VA-HC-N80-Q	VA-EP-N80-Q
	L80-1	VA-HC-L80-1	VA-EP-L80-1
	L80-13Cr		
90,000	C90-1	VA-HC-C90-1	VA-EP-C90-1
95,000	R95	VA-HC-R95	VA-EP-R95
	T95-1	VA-HC-T95-1	VA-EP-T95-1
110,000	C110	VA-HC-C110	VA-EP-C110
	P110	VA-HC-P110	VA-EP-P110
125,000	Q125-1	VA-HC-Q125-1	VA-EP-Q125-1
140,000			
150,000			

On request in combination with:



## PROPRIETARY GRADES – THE VA SERIES

EXTREME PROPERTIES	SOUR SERVICE			DEEP WELL		LOW TEMPERATURE	MILD SWEET GAS	MILD SWEET GAS	SWEET GAS
		with High Collapse	with Enhanced Properties		with High Collapse		Ferrite Pearlite	Quenched & Tempered	
Page 18	Page 22	Page 26	Page 30	Page 34	Page 40	Page 41	Page 42	Page 42	Page 43
						VA-LT-J55	VA-FP-55-1CR		
						VA-LT-K55			
							VA-FP-75-1CR		
VA-XP-N80-Q						VA-LT-N80-Q	VA-FP-80-1CR	VA-N80-Q-1CR/ VA-N80-Q-3CR	
VA-XP-L80-1						VA-LT-L80-1		VA-L80-1-1CR/ VA-L80-1-3CR	
	VA-SS-80	VA-SS-80-HC	VA-SS-80-EP						
VA-XP-C90-1						VA-LT-C90-1			
	VA-SS-90	VA-SS-90-HC	VA-SS-90-EP						
VA-XP-R95						VA-LT-R95		VA-R95-1CR/ VA-R95-3CR	
VA-XP-T95-1						VA-LT-T95-1			
	VA-SS-95	VA-SS-95-HC	VA-SS-95-EP						VA-95-13CR
						VA-LT-C110			
	VA-SS-110	VA-SS-110-HC	VA-SS-110-EP						
	VA-S-110	VA-S-110-HC	VA-S-110-EP						
VA-XP-P110						VA-LT-P110		VA-P110-1CR/ VA-P110-3CR	
VA-XP-Q125-1						VA-LT-Q125-1			
	VA-S-125	VA-S-125-HC	VA-S-125-EP	VA-D-125	VA-D-125-HC				
				VA-D-140	VA-D-140-HC				
				VA-D-150	VA-D-150-HC				

LOW TEMPERATURE

EP/XP

EP/XP

HC

# VA – HIGH COLLAPSE – SERIES

Seamless Casing complying with API Specification 5CT for use in high external pressure environments for collapse values exceeding those published by API in TR 5C3 and burst values according to the API TR 5C3.

## Marking

According to API specification 5CT plus additional marking of “VA-HC-...” (... stands e.g. for N80-Q or L80-1 etc.). Upon request API monogram will be applied.

## Mechanical properties and chemical composition

According to API specification 5CT. All grades are subject to hot rotary straightening.

## Inspection and testing

According to API specification 5CT. All pipes are subject to a 100 % coverage ultrasonic testing inspection for wall thickness (min. 95 % average wall).



### NON-DESTRUCTIVE TESTING

NON-DESTRUCTIVE TESTING			Acceptance (inspection) levels		Remark
Flux Leakage Inspection (Pipe Body)	Ultrasonic Inspection (Pipe Body)	Magnetic Particle Inspection (Pipe Ends)	Internal Longitudinal & Transverse	External Longitudinal & Transverse	
A	A	R	L2 (5 % nWT)	L2 (5 % nWT)	*
B	C	R	L2 (5 % nWT)	L2 (5 % nWT)	**
*** P110 to A.10 SR16 impact testing (Charpy V-notch)			L4 (12.5 % nWT)	L4 (12.5 % nWT)	***
A	one method or a combination of methods at manufacturer's option shall be used in addition to ultrasonic inspection to inspect the outside surface		*	VA-HC-N80-Q / VA-HC-L80-1 / VA-HC-R95 / VA-HC-P110	
B	Ultrasonic inspection shall be used to inspect the outside and inside surface		**	VA-HC-C90-1 / VA-HC-T95-1 / VA-HC-C110 / VA-HC-Q125-1	
C	Required		***	On customer request VA-HC-P110 can be delivered with NDT acceptance levels corresponding to API specification 5CT, grade P110 to A.10 SR16 impact testing (Charpy V-notch).	
R	nominal Wall Thickness		L...	acceptance level	

Other performance properties as listed in API TR 5C3 (see appendix). Collapse performance numbers guaranteed on a statistical database. Collapse testing is done at the decision of VAT or if required by customer with a frequency of 1 sample (min. length is 8 times the outside diameter) per heat treatment lot. Higher collapse values or collapse values for special drift diameters on request.



DIMENSION (STANDARD DRIFT SIZE)

VA-HC-N80-Q

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE															
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC			
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
4 ½	114.30	11.60	17.26	0.250	6.35	7900	54.5	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	53.7
		13.50	20.09	0.290	7.37	10000	69.0	9020	62.3	9020	62.3	9020	62.3	9020	62.3	9020	62.3	8100	55.9	9020	62.3	9020	62.3
		15.10	22.47	0.337	8.56	12300	84.8	10480	72.3	10480	72.3	10480	72.3	10480	72.3	9900	68.3	8100	55.9	10280	70.9	10480	72.3
5	127.00	15.00	22.32	0.296	7.52	8800	60.7	8290	57.2	8290	57.2	8290	57.2	8290	57.2	7460	51.5	8290	57.2	8290	57.2	8290	57.2
		18.00	26.79	0.362	9.19	11750	81.0	10140	69.9	10140	69.9	9730	67.1	9910	68.4	7460	51.5	10140	69.9	10140	69.9	10140	69.9
		21.40	31.85	0.437	11.10	14950	103.1	12240	84.4	11800	81.5	11990	82.7	9910	68.4	7460	51.5	10260	70.8	10820	74.6	10820	74.6
		23.20	34.53	0.478	12.14	16600	114.5	13380	92.3	11800	81.5	11990	82.7	9910	68.4	7460	51.5	10260	70.8	10820	74.6	10820	74.6
		24.10	35.86	0.500	12.70	17500	120.7	14000	96.6	11800	81.5	11990	82.7	9910	68.4	7460	51.5	10260	70.8	10820	74.6	10820	74.6
5 ½	139.70	17.00	25.30	0.304	7.72	7800	53.8	7740	53.4	7740	53.4	7740	53.4	7740	53.4	6880	47.5	7740	53.4	7740	53.4	7740	53.4
		20.00	29.76	0.361	9.17	10250	70.7	9190	63.4	9190	63.4	8910	61.5	9000	62.1	6880	47.5	9190	63.4	9190	63.4	9190	63.4
		23.00	34.23	0.415	10.54	12450	85.8	10560	72.9	10560	72.9	10560	72.9	9000	62.1	6880	47.5	9360	64.6	9880	68.2	9880	68.2
		26.00	38.69	0.476	12.09	14540	100.2	12130	83.6	10810	74.5	11280	77.8	-	-	-	-	-	-	-	-	-	-
6 ¾	168.28	24.00	35.72	0.352	8.94	7300	50.3	7440	51.3	7440	51.3	7440	51.3	7440	51.3	5910	40.8	7440	51.3	7440	51.3	7440	51.3
		28.00	41.67	0.417	10.59	9650	66.5	8810	60.8	8810	60.8	8810	60.8	8810	60.8	8810	60.8	8810	60.8	8810	60.8	8810	60.8
		32.00	47.62	0.475	12.06	11600	80.0	10040	69.2	10040	69.2	9740	67.2	9820	67.8	5910	40.8	10040	69.2	10040	69.2	10040	69.2
7	177.80	23.00	34.23	0.317	8.05	5500	37.9	6340	43.7	6340	43.7	6340	43.7	6340	43.7	5730	39.6	6340	43.7	6340	43.7	6340	43.7
		26.00	38.69	0.362	9.19	6950	47.9	7240	49.9	7240	49.9	7240	49.9	7240	49.9	5730	39.6	7240	49.9	7240	49.9	7240	49.9
		29.00	43.16	0.408	10.36	8550	59.0	8160	56.3	8160	56.3	8160	56.3	8160	56.3	5730	39.6	8160	56.3	8160	56.3	8160	56.3
		32.00	47.62	0.453	11.51	10050	69.3	9060	62.5	9060	62.5	9060	62.5	9060	62.5	5730	39.6	9060	62.5	9060	62.5	9060	62.5
		35.00	52.09	0.498	12.65	11500	79.3	9960	68.7	9890	68.3	9960	68.7	9960	68.7	5730	39.6	9960	68.7	9960	68.7	9960	68.7
		38.00	56.55	0.540	13.72	12800	88.3	10800	74.5	9890	68.3	10380	71.6	10450	72.1	5730	39.6	10660	73.5	10800	74.5	10800	74.5

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-HC-L80-1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE															
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC			
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
4 ½	114.30	11.60	17.26	0.250	6.35	7800	53.8	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	53.7
		13.50	20.09	0.290	7.37	9650	66.5	9020	62.3	9020	62.3	9020	62.3	9020	62.3	9020	62.3	8100	55.9	9020	62.3	9020	62.3
		15.10	22.47	0.337	8.56	11650	80.3	10480	72.3	10480	72.3	10480	72.3	10480	72.3	9900	68.3	8100	55.9	10280	70.9	10480	72.3
5	127.00	15.00	22.32	0.296	7.52	8600	59.3	8290	57.2	8290	57.2	8290	57.2	8290	57.2	7460	51.5	8290	57.2	8290	57.2	8290	57.2
		18.00	26.79	0.362	9.19	11200	77.2	10140	69.9	10140	69.9	9730	67.1	9910	68.4	7460	51.5	10140	69.9	10140	69.9	10140	69.9
		21.40	31.85	0.437	11.10	13400	92.4	12240	84.4	11800	81.5	11990	82.7	9910	68.4	7460	51.5	10260	70.8	10820	74.6	10820	74.6
		23.20	34.53	0.478	12.14	15500	106.9	13380	92.3	11800	81.5	11990	82.7	9910	68.4	7460	51.5	10260	70.8	10820	74.6	10820	74.6
		24.10	35.86	0.500	12.70	16300	112.4	14000	96.6	11800	81.5	11990	82.7	9910	68.4	7460	51.5	10260	70.8	10820	74.6	10820	74.6
5 ½	139.70	17.00	25.30	0.304	7.72	7700	53.1	7740	53.4	7740	53.4	7740	53.4	7740	53.4	6880	47.5	7740	53.4	7740	53.4	7740	53.4
		20.00	29.76	0.361	9.17	9900	68.3	9190	63.4	9190	63.4	8910	61.5	9000	62.1	6880	47.5	9190	63.4	9190	63.4	9190	63.4
		23.00	34.23	0.415	10.54	11750	81.0	10560	72.9	10560	72.9	10560	72.9	9000	62.1	6880	47.5	9360	64.6	9880	68.2	9880	68.2
		26.00	38.69	0.476	12.09	13670	94.3	12130	83.6	10810	74.5	11280	77.8	-	-	-	-	-	-	-	-	-	-
6 ¾	168.28	24.00	35.72	0.352	8.94	7250	50.0	7440	51.3	7440	51.3	7440	51.3	7440	51.3	5910	40.8	7440	51.3	7440	51.3	7440	51.3
		28.00	41.67	0.417	10.59	9350	64.5	8810	60.8	8810	60.8	8810	60.8	8810	60.8	8810	60.8	8810	60.8	8810	60.8	8810	60.8
		32.00	47.62	0.475	12.06	11050	76.2	10040	69.2	10040	69.2	9740	67.2	9820	67.8	5910	40.8	10040	69.2	10040	69.2	10040	69.2
7	177.80	23.00	34.23	0.317	8.05	5300	36.5	6340	43.7	6340	43.7	6340	43.7	6340	43.7	5730	39.6	6340	43.7	6340	43.7	6340	43.7
		26.00	38.69	0.362	9.19	6900	47.6	7240	49.9	7240	49.9	7240	49.9	7240	49.9	5730	39.6	7240	49.9	7240	49.9	7240	49.9
		29.00	43.16	0.408	10.36	8350	57.6	8160	56.3	8160	56.3	8160	56.3	8160	56.3	5730	39.6	8160	56.3	8160	56.3	8160	56.3
		32.00	47.62	0.453	11.51	9700	66.9	9060	62.5	9060	62.5	9060	62.5	9060	62.5	5730	39.6	9060	62.5	9060	62.5	9060	62.5
		35.00	52.09	0.498	12.65	10950	75.5	9960	68.7	9890	68.3	9960	68.7	9960	68.7	5730	39.6	9960	68.7	9960	68.7	9960	68.7
		38.00	56.55	0.540	13.72	12100	83.4	10800	74.5	9890	68.3	10380	71.6	10450	72.1	5730	39.6	10660	73.5	10800	74.5	10800	74.5

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-HC-C90-1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	8350	57.6	8750	60.4	8750	60.4	8750	60.4	8750	60.4	8750	60.4
		13.50	20.09	0.290	7.37	10500	72.4	10150	70.1	10150	70.1	10150	70.1	10150	70.1	9110	62.9
		15.10	22.47	0.337	8.56	12800	88.3	11800	81.4	11800	81.4	11800	81.4	11130	76.8	9110	62.9
5	127.00	15.00	22.32	0.296	7.52	9300	64.1	9320	64.3	9320	64.3	9320	64.3	9320	64.3	8390	57.9
		18.00	26.79	0.362	9.19	12250	84.5	11400	78.6	11400	78.6	10940	75.5	11150	77.0	8390	57.9
		21.40	31.85	0.437	11.10	15400	106.2	13770	95.0	13280	91.6	13490	93.1	11150	77.0	8390	57.9
		23.20	34.53	0.478	12.14	17100	117.9	15060	103.9	13280	91.6	13490	93.1	11150	77.0	8390	57.9
		24.10	35.86	0.500	12.70	18000	124.1	15750	108.7	13280	91.6	13490	93.1	11150	77.0	8390	57.9
5 1/2	139.70	17.00	25.30	0.304	7.72	8300	57.2	8710	60.1	8710	60.1	8710	60.1	8710	60.1	7740	53.4
		20.00	29.76	0.361	9.17	10800	74.5	10340	71.3	10340	71.3	10020	69.2	10120	69.8	7740	53.4
		23.00	34.23	0.415	10.54	12900	88.9	11880	82.0	11880	82.0	11880	82.0	10120	69.8	7740	53.4
		26.00	38.69	0.476	12.09	15120	104.2	13650	94.1	12150	83.8	12710	87.6	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8.94	7700	53.1	8370	57.7	8370	57.7	8370	57.7	8370	57.7	6650	45.9
		28.00	41.67	0.417	10.59	10150	70.0	9910	68.4	9910	68.4	9910	68.4	9910	68.4	6650	45.9
		32.00	47.62	0.475	12.06	12200	84.1	11290	77.9	11290	77.9	10960	75.6	11050	76.2	6650	45.9
7	177.80	23.00	34.23	0.317	8.05	5500	37.9	7130	49.2	7130	49.2	7130	49.2	7130	49.2	6450	44.5
		26.00	38.69	0.362	9.19	7350	50.7	8150	56.2	8150	56.2	8150	56.2	8150	56.2	6450	44.5
		29.00	43.16	0.408	10.36	9050	62.4	9180	63.3	9180	63.3	9180	63.3	9180	63.3	6450	44.5
		32.00	47.62	0.453	11.51	10600	73.1	10190	70.4	10190	70.4	10190	70.4	10190	70.4	6450	44.5
		35.00	52.09	0.498	12.65	12000	82.7	11210	77.3	11130	76.8	11210	77.3	11210	77.3	6450	44.5
		38.00	56.55	0.540	13.72	13300	91.7	12150	83.9	11130	76.8	11680	80.6	11760	81.1	6450	44.5

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-HC-T95-1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	8650	59.6	9240	63.7	9240	63.7	9240	63.7	9240	63.7	9240	63.7
		13.50	20.09	0.290	7.37	11000	75.8	10710	73.9	10710	73.9	10710	73.9	10710	73.9	9620	66.3
		15.10	22.47	0.337	8.56	13450	92.7	12450	85.8	12450	85.8	12450	85.8	11750	81.0	9620	66.3
5	127.00	15.00	22.32	0.296	7.52	9650	66.5	9840	67.9	9840	67.9	9840	67.9	9840	67.9	8860	61.1
		18.00	26.79	0.362	9.19	12850	88.6	12040	82.9	12040	82.9	11550	79.6	11770	81.2	8860	61.1
		21.40	31.85	0.437	11.10	16200	111.7	14530	100.2	14020	96.7	14240	98.2	11770	81.2	8860	61.1
		23.20	34.53	0.478	12.14	18000	124.1	15890	109.6	14020	96.7	14240	98.2	11770	81.2	8860	61.1
		24.10	35.86	0.500	12.70	18900	130.3	16630	114.6	14020	96.7	14240	98.2	11770	81.2	8860	61.1
5 1/2	139.70	17.00	25.30	0.304	7.72	8600	59.3	9190	63.3	9190	63.3	9190	63.3	9190	63.3	8170	56.3
		20.00	29.76	0.361	9.17	11250	77.6	10910	75.2	10910	75.2	10580	73.0	10680	73.7	8170	56.3
		23.00	34.23	0.415	10.54	13550	93.4	12540	86.5	12540	86.5	12540	86.5	10680	73.7	8170	56.3
		26.00	38.69	0.476	12.09	15980	110.2	14390	99.2	12820	88.4	13400	92.4	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8.94	7950	54.8	8830	60.9	8830	60.9	8830	60.9	8830	60.9	7020	48.4
		28.00	41.67	0.417	10.59	10650	73.4	10460	72.1	10460	72.1	10460	72.1	10460	72.1	7020	48.4
		32.00	47.62	0.475	12.06	12700	87.6	11920	82.1	11920	82.1	11560	79.7	11660	80.4	7020	48.4
7	177.80	23.00	34.23	0.317	8.05	5600	38.6	7530	51.9	7530	51.9	7530	51.9	7530	51.9	6810	46.9
		26.00	38.69	0.362	9.19	7550	52.1	8600	59.2	8600	59.2	8600	59.2	8600	59.2	6810	46.9
		29.00	43.16	0.408	10.36	9400	64.8	9690	66.8	9690	66.8	9690	66.8	9690	66.8	6810	46.9
		32.00	47.62	0.453	11.51	11050	76.2	10760	74.2	10760	74.2	10760	74.2	10760	74.2	6810	46.9
		35.00	52.09	0.498	12.65	12550	86.5	11830	81.6	11750	81.0	11830	81.6	11830	81.6	6810	46.9
		38.00	56.55	0.540	13.72	13950	96.2	12830	88.5	11750	81.0	12320	85.0	12410	85.6	6810	46.9

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

VA-HC-R95																					
				COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE															
SC		LC		all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC			
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
8750	60.4	8750	60.4	9000	62.1	9240	63.7	9240	63.7	9240	63.7	9240	63.7	9240	63.7	9240	63.7	9240	63.7	9240	63.7
10150	70.1	10150	70.1	11600	80.0	10710	73.9	10710	73.9	10710	73.9	10710	73.9	10710	73.9	9620	66.3	10710	73.9	10710	73.9
11560	79.8	11800	81.4	14250	98.3	12450	85.8	12450	85.8	12450	85.8	12450	85.8	11750	81.0	9620	66.3	12210	84.2	12450	85.8
9320	64.3	9320	64.3	10100	69.6	9840	67.9	9840	67.9	9840	67.9	9840	67.9	9840	67.9	8860	61.1	9840	67.9	9840	67.9
11400	78.6	11400	78.6	13600	93.8	12040	82.9	12040	82.9	11550	79.6	11770	81.2	8860	61.1	12040	82.9	12040	82.9	12040	82.9
11540	79.6	12170	84.0	17250	118.9	14530	100.2	14020	96.7	14240	98.2	11770	81.2	8860	61.1	12180	84.0	12850	88.6	12850	88.6
11540	79.6	12170	84.0	19150	132.0	15890	109.6	14020	96.7	14240	98.2	11770	81.2	8860	61.1	12180	84.0	12850	88.6	12850	88.6
11540	79.6	12170	84.0	20150	138.9	16630	114.6	14020	96.7	14240	98.2	11770	81.2	8860	61.1	12180	84.0	12850	88.6	12850	88.6
8710	60.1	8710	60.1	8950	61.7	9190	63.3	9190	63.3	9190	63.3	9190	63.3	9190	63.3	8170	56.3	9190	63.3	9190	63.3
10340	71.3	10340	71.3	11900	82.1	10910	75.2	10910	75.2	10580	73.0	10680	73.7	8170	56.3	10910	75.2	10910	75.2	10910	75.2
10530	72.7	11110	76.7	14400	99.3	12540	86.5	12540	86.5	12540	86.5	12540	86.5	10680	73.7	8170	56.3	11120	76.7	11730	80.9
-	-	-	-	17290	119.2	14390	99.2	12820	88.4	13400	92.4	-	-	-	-	-	-	-	-	-	-
8370	57.7	8370	57.7	8250	56.9	8830	60.9	8830	60.9	8830	60.9	8830	60.9	8830	60.9	7020	48.4	8830	60.9	8830	60.9
9910	68.4	9910	68.4	11150	76.9	10460	72.1	10460	72.1	10460	72.1	10460	72.1	10460	72.1	7020	48.4	10460	72.1	10460	72.1
11290	77.9	11290	77.9	13450	92.7	11920	82.1	11920	82.1	11560	79.7	11660	80.4	7020	48.4	11920	82.1	11920	82.1	11920	82.1
7130	49.2	7130	49.2	5800	40.0	7530	51.9	7530	51.9	7530	51.9	7530	51.9	7530	51.9	6810	46.9	7530	51.9	7530	51.9
8150	56.2	8150	56.2	7800	53.8	8600	59.2	8600	59.2	8600	59.2	8600	59.2	8600	59.2	6810	46.9	8600	59.2	8600	59.2
9180	63.3	9180	63.3	9850	67.9	9690	66.8	9690	66.8	9690	66.8	9690	66.8	9690	66.8	6810	46.9	9690	66.8	9690	66.8
10190	70.4	10190	70.4	11650	80.3	10760	74.2	10760	74.2	10760	74.2	10760	74.2	10760	74.2	6810	46.9	10760	74.2	10760	74.2
11210	77.3	11210	77.3	13300	91.7	11830	81.6	11750	81.0	11830	81.6	11830	81.6	11830	81.6	6810	46.9	11830	81.6	11830	81.6
11990	82.7	12150	83.9	14800	102.0	12830	88.5	11750	81.0	12320	85.0	12410	85.6	6810	46.9	12650	87.2	12830	88.5	12830	88.5

VA-HC-C110																					
				COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE															
SC		LC		all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC			
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
9240	63.7	9240	63.7	9500	65.5	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7
10710	73.9	10710	73.9	12450	85.8	12410	85.5	12410	85.5	12410	85.5	12410	85.5	12410	85.5	11130	76.7	12410	85.5	12410	85.5
12210	84.2	12450	85.8	15500	106.9	14420	99.3	14420	99.3	14420	99.3	14420	99.3	13610	93.8	11130	76.7	14130	97.4	14420	99.3
9840	67.9	9840	67.9	10750	74.1	11400	78.5	11400	78.5	11400	78.5	11400	78.5	11400	78.5	10260	70.7	11400	78.5	11400	78.5
12040	82.9	12040	82.9	14750	101.7	13940	96.0	13940	96.0	13370	92.2	13630	93.9	10260	70.7	13940	96.0	13940	96.0	13940	96.0
12180	84.0	12850	88.6	18850	130.0	16820	115.9	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5	14880	102.5
12180	84.0	12850	88.6	20950	144.5	18400	126.8	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5	14880	102.5
12180	84.0	12850	88.6	22100	152.4	19250	132.7	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5	14880	102.5
9190	63.3	9190	63.3	9400	64.8	10640	73.3	10640	73.3	10640	73.3	10640	73.3	10640	73.3	9460	65.2	10640	73.3	10640	73.3
10910	75.2	10910	75.2	12850	88.6	12640	87.1	12640	87.1	12250	84.4	12370	85.2	9460	65.2	12640	87.1	12640	87.1	12640	87.1
11120	76.7	11730	80.9	15650	107.9	14530	100.1	14530	100.1	14530	100.1	14530	100.1	12370	85.2	9460	65.2	12870	88.7	13580	93.6
-	-	-	-	18820	129.8	16650	114.8	14840	102.3	15500	106.9	-	-	-	-	-	-	-	-	-	-
8830	60.9	8830	60.9	8650	59.6	10230	70.5	10230	70.5	10230	70.5	10230	70.5	10230	70.5	8120	56.0	10230	70.5	10230	70.5
10460	72.1	10460	72.1	11950	82.4	12120	83.5	12120	83.5	12120	83.5	12120	83.5	12120	83.5	8120	56.0	12120	83.5	12120	83.5
11920	82.1	11920	82.1	14550	100.3	13800	95.1	13800	95.1	13390	92.3	13500	93.0	8120	56.0	13800	95.1	13800	95.1	13800	95.1
7530	51.9	7530	51.9	5900	40.7	8720	60.1	8720	60.1	8720	60.1	8720	60.1	8720	60.1	7880	54.3	8720	60.1	8720	60.1
8600	59.2	8600	59.2	8450	58.3	9960	68.6	9960	68.6	9960	68.6	9960	68.6	9960	68.6	7880	54.3	9960	68.6	9960	68.6
9690	66.8	9690	66.8	10450	72.1	11220	77.3	11220	77.3	11220	77.3	11220	77.3	11220	77.3	7880	54.3	11220	77.3	11220	77.3
10760	74.2	10760	74.2	12500	86.2	12460	85.9	12460	85.9	12460	85.9	12460	85.9	12460	85.9	7880	54.3	12460	85.9	12460	85.9
11830	81.6	11830	81.6	14400	99.3	13700	94.4	13600	93.7	13700	94.4	13700	94.4	13700	94.4	7880	54.3	13700	94.4	13700	94.4
12650	87.2	12830	88.5	16100	111.0	14850	102.4	13600	93.7	14270	98.3	14370	99.0	7880	54.3	14650	101.0	14850	102.4	14850	102.4

DIMENSION (STANDARD DRIFT SIZE)

VA-HC-P110

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE															
						all thread types		VA <sup>superior</sup>		VAGT		VA <sup>roughneck</sup>		BC regular		BC special clearance		SC		LC			
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
4 ½	114.30	11.60	17.26	0.250	6.35	9750	67.2	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7
		13.50	20.09	0.290	7.37	12950	89.3	12410	85.5	12410	85.5	12410	85.5	12410	85.5	11130	76.7	12410	85.5	12410	85.5	12410	85.5
		15.10	22.47	0.337	8.56	16200	111.7	14420	99.3	14420	99.3	14420	99.3	14420	99.3	13610	93.8	11130	76.7	14130	97.4	14420	99.3
5	127.00	15.00	22.32	0.296	7.52	11100	76.5	11400	78.5	11400	78.5	11400	78.5	11400	78.5	10260	70.7	11400	78.5	11400	78.5	11400	78.5
		18.00	26.79	0.362	9.19	15450	106.5	13940	96.0	13940	96.0	13370	92.2	13630	93.9	10260	70.7	13940	96.0	13940	96.0	13940	96.0
		21.40	31.85	0.437	11.10	19800	136.5	16820	115.9	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5	14880	102.5
		23.20	34.53	0.478	12.14	22050	152.0	18400	126.8	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5	14880	102.5
		24.10	35.86	0.500	12.70	23250	160.3	19250	132.7	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5	14880	102.5
5 ½	139.70	17.00	25.30	0.304	7.72	9650	66.5	10640	73.3	10640	73.3	10640	73.3	10640	73.3	9460	65.2	10640	73.3	10640	73.3	10640	73.3
		20.00	29.76	0.361	9.17	13300	91.7	12640	87.1	12640	87.1	12250	84.4	12370	85.2	9460	65.2	12640	87.1	12640	87.1	12640	87.1
		23.00	34.23	0.415	10.54	16350	112.7	14530	100.1	14530	100.1	14530	100.1	12370	85.2	9460	65.2	12870	88.7	13580	93.6	13580	93.6
		26.00	38.69	0.476	12.09	19710	135.9	16650	114.8	14840	102.3	15500	106.9	-	-	-	-	-	-	-	-	-	-
6 ⅝	168.28	24.00	35.72	0.352	8.94	8950	61.7	10230	70.5	10230	70.5	10230	70.5	10230	70.5	8120	56.0	10230	70.5	10230	70.5	10230	70.5
		28.00	41.67	0.417	10.59	13000	89.6	12120	83.5	12120	83.5	12120	83.5	12120	83.5	8120	56.0	12120	83.5	12120	83.5	12120	83.5
		32.00	47.62	0.475	12.06	15200	104.8	13800	95.1	13800	95.1	13390	92.3	13500	93.0	8120	56.0	13800	95.1	13800	95.1	13800	95.1
7	177.80	23.00	34.23	0.317	8.05	5950	41.0	8720	60.1	8720	60.1	8720	60.1	8720	60.1	7880	54.3	8720	60.1	8720	60.1	8720	60.1
		26.00	38.69	0.362	9.19	8700	60.0	9960	68.6	9960	68.6	9960	68.6	9960	68.6	7880	54.3	9960	68.6	9960	68.6	9960	68.6
		29.00	43.16	0.408	10.36	10750	74.1	11220	77.3	11220	77.3	11220	77.3	11220	77.3	7880	54.3	11220	77.3	11220	77.3	11220	77.3
		32.00	47.62	0.453	11.51	13000	89.6	12460	85.9	12460	85.9	12460	85.9	12460	85.9	7880	54.3	12460	85.9	12460	85.9	12460	85.9
		35.00	52.09	0.498	12.65	15050	103.8	13700	94.4	13600	93.7	13700	94.4	13700	94.4	7880	54.3	13700	94.4	13700	94.4	13700	94.4
		38.00	56.55	0.540	13.72	16850	116.2	14850	102.4	13600	93.7	14270	98.3	14370	99.0	7880	54.3	14650	101.0	14850	102.4	14850	102.4

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-HC-Q125-1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE															
						all thread types		VA <sup>superior</sup>		VAGT		VA <sup>roughneck</sup>		BC regular		BC special clearance		SC		LC			
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 ½	114.30	11.60	17.26	0.250	6.35	10250	70.7	12150	83.8	12150	83.8	12150	83.8	12150	83.8	12150	83.8	12150	83.8	12150	83.8	12150	83.8
		13.50	20.09	0.290	7.37	13900	95.8	14100	97.3	14100	97.3	14100	97.3	14100	97.3	12650	87.2	14100	97.3	14100	97.3	14100	97.3
		15.10	22.47	0.337	8.56	17700	122.0	16380	113.0	16380	113.0	16380	113.0	15460	106.6	12650	87.2	16060	110.8	16380	113.0	16380	113.0
5	127.00	15.00	22.32	0.296	7.52	11800	81.4	12950	89.3	12950	89.3	12950	89.3	12950	89.3	11660	80.4	12950	89.3	12950	89.3	12950	89.3
		18.00	26.79	0.362	9.19	16800	115.8	15840	109.2	15840	109.2	15200	104.8	15490	106.8	11660	80.4	15840	109.2	15840	109.2	15840	109.2
		21.40	31.85	0.437	11.10	21800	150.3	19120	131.8	18440	127.2	18730	129.2	15490	106.8	11660	80.4	16030	110.5	16900	116.6	16900	116.6
		23.20	34.53	0.478	12.14	24350	167.9	20910	144.2	18440	127.2	18730	129.2	15490	106.8	11660	80.4	16030	110.5	16900	116.6	16900	116.6
		24.10	35.86	0.500	12.70	25700	177.2	21880	150.9	18440	127.2	18730	129.2	15490	106.8	11660	80.4	16030	110.5	16900	116.6	16900	116.6
5 ½	139.70	17.00	25.30	0.304	7.72	10150	70.0	12090	83.4	12090	83.4	12090	83.4	12090	83.4	10750	74.1	12090	83.4	12090	83.4	12090	83.4
		20.00	29.76	0.361	9.17	14400	99.3	14360	99.0	14360	99.0	13920	96.0	14060	96.9	10750	74.1	14360	99.0	14360	99.0	14360	99.0
		23.00	34.23	0.415	10.54	17900	123.4	16510	113.8	16510	113.8	16510	113.8	14060	96.9	10750	74.1	14630	100.9	15440	106.5	15440	106.5
		26.00	38.69	0.476	12.09	21970	151.5	18930	130.5	16880	116.4	17620	121.5	-	-	-	-	-	-	-	-	-	-
6 ⅝	168.28	24.00	35.72	0.352	8.94	9450	65.2	11620	80.1	11620	80.1	11620	80.1	11620	80.1	9230	63.7	11620	80.1	11620	80.1	11620	80.1
		28.00	41.67	0.417	10.59	13250	91.4	13770	94.9	13770	94.9	13770	94.9	13770	94.9	9230	63.7	13770	94.9	13770	94.9	13770	94.9
		32.00	47.62	0.475	12.06	16550	114.1	15680	108.1	15680	108.1	15220	104.9	15340	105.8	9230	63.7	15680	108.1	15680	108.1	15680	108.1
7	177.80	23.00	34.23	0.317	8.05	6100	42.1	9910	68.3	9910	68.3	9910	68.3	9910	68.3	8960	61.8	9910	68.3	9910	68.3	9910	68.3
		26.00	38.69	0.362	9.19	8750	60.3	11310	78.0	11310	78.0	11310	78.0	11310	78.0	8960	61.8	11310	78.0	11310	78.0	11310	78.0
		29.00	43.16	0.408	10.36	11400	78.6	12750	87.9	12750	87.9	12750	87.9	12750	87.9	8960	61.8	12750	87.9	12750	87.9	12750	87.9
		32.00	47.62	0.453	11.51	14000	96.5	14160	97.7	14160	97.7	14160	97.7	14160	97.7	8960	61.8	14160	97.7	14160	97.7	14160	97.7
		35.00	52.09	0.498	12.65	16350	112.7	15560	107.3	15460	106.6	15560	107.3	15560	107.3	8960	61.8	15560	107.3	15560	107.3	15560	107.3
		38.00	56.55	0.540	13.72	18500	127.6	16880	116.4	15460	106.6	16220	111.8	16330	112.6	8960	61.8	16650	114.8	16880	116.4	16880	116.4

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

# VA – ENHANCED PROPERTIES – SERIES

Seamless Casing complying with API specification 5CT with enhanced properties for collapse and burst values exceeding those published by API in TR 5C3.

## Marking

According to API specification 5CT plus additional marking of “VA-EP-...” (... stands e.g. for N80-Q or L80-1 etc.). Upon request API monogram will be applied.

## Mechanical properties and chemical composition

According to API specification 5CT. All grades are subject to hot rotary straightening.

## Inspection and testing

According to API specification 5CT. All pipes are subject to a 100% coverage ultrasonic testing inspection for wall thickness (min. 95% average wall).



NON-DESTRUCTIVE TESTING			Acceptance (inspection) levels		Remark
Flux Leakage Inspection (Pipe Body)	Ultrasonic Inspection (Pipe Body)	Magnetic Particle Inspection (Pipe Ends)	Internal Longitudinal & Transverse	External Longitudinal & Transverse	
A	A	R	L2 (5 % nWT)	L2 (5 % nWT)	*
B	C	R	L2 (5 % nWT)	L2 (5 % nWT)	**
*** P110 to A.10 SR16 impact testing (Charpy V-notch)			L4 (12.5 % nWT)	L4 (12.5 % nWT)	***
A	one method or a combination of methods at manufacturer's option shall be used in addition to ultrasonic inspection to inspect the outside surface		*	VA-EP-N80-Q / VA-EP-L80-1 / VA-EP-R95 / VA-EP-P110	
B	Ultrasonic inspection shall be used to inspect the outside and inside surface		**	VA-EP-C90-1 / VA-EP-T95-1 / VA-EP-C110 / VA-EP-Q125-1	
C	required		***	On customer request VA-EP-P110 can be delivered with NDT acceptance levels corresponding to API specification 5CT, grade P110 to A.10 SR16 impact testing (Charpy V-notch).	
R	nominal Wall Thickness		L...	acceptance level	

Other performance properties as listed in API TR 5C3 (see appendix). Collapse performance numbers guaranteed on a statistical database. Collapse testing is done at the decision of VAT or if required by customer with a frequency of 1 sample (min. length is 8 times the outside diameter) per heat treatment lot. Higher collapse values or collapse values for special drift diameters on request.

DIMENSION (STANDARD DRIFT SIZE)

VA-EP-N80Q

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE											
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance			
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
4 1/2	114.30	11.60	17.26	0.250	6.35	7900	54.5	8260	57.0	8260	57.0	8260	57.0	8260	57.0	8260	57.0		
		13.50	20.09	0.290	7.37	10000	69.0	9590	66.1	9590	66.1	9590	66.1	9590	66.1	8600	59.3		
		15.10	22.47	0.337	8.56	12300	84.8	11140	76.8	11140	76.8	11140	76.8	10520	72.5	8600	59.3		
5	127.00	15.00	22.32	0.296	7.52	8800	60.7	8810	60.7	8810	60.7	8810	60.7	8810	60.7	8810	60.7	7930	54.6
		18.00	26.79	0.362	9.19	11750	81.0	10770	74.2	10770	74.2	10330	71.2	10530	72.6	7930	54.6		
		21.40	31.85	0.437	11.10	14950	103.1	13000	89.6	12540	86.5	12740	87.8	10530	72.6	7930	54.6		
		23.20	34.53	0.478	12.14	16600	114.5	14220	98.0	12540	86.5	12740	87.8	10530	72.6	7930	54.6		
		24.10	35.86	0.500	12.70	17500	120.7	14520	100.1	12540	86.5	12740	87.8	10530	72.6	7930	54.6		
5 1/2	139.70	17.00	25.30	0.304	7.72	7800	53.8	8220	56.7	8220	56.7	8220	56.7	8220	56.7	7310	50.4		
		20.00	29.76	0.361	9.17	10250	70.7	9760	67.3	9760	67.3	9470	65.3	9560	65.9	7310	50.4		
		23.00	34.23	0.415	10.54	12450	85.8	11220	77.4	11220	77.4	11220	77.4	9560	65.9	7310	50.4		
		26.00	38.69	0.476	12.09	14540	100.2	12860	88.7	11470	79.1	11980	82.6	-	-	-	-		
6 5/8	168.28	24.00	35.72	0.352	8.94	7300	50.3	7900	54.5	7900	54.5	7900	54.5	7900	54.5	6280	43.3		
		28.00	41.67	0.417	10.59	9650	66.5	9360	64.5	9360	64.5	9360	64.5	9360	64.5	6280	43.3		
		32.00	47.62	0.475	12.06	11600	80.0	10670	73.5	10670	73.5	10350	71.3	10430	71.9	6280	43.3		
7	177.80	23.00	34.23	0.317	8.05	5500	37.9	6740	46.4	6740	46.4	6740	46.4	6740	46.4	6090	42.0		
		26.00	38.69	0.362	9.19	6950	47.9	7690	53.0	7690	53.0	7690	53.0	7690	53.0	6090	42.0		
		29.00	43.16	0.408	10.36	8550	59.0	8670	59.8	8670	59.8	8670	59.8	8670	59.8	6090	42.0		
		32.00	47.62	0.453	11.51	10050	69.3	9630	66.4	9630	66.4	9630	66.4	9630	66.4	6090	42.0		
		35.00	52.09	0.498	12.65	11500	79.3	10580	73.0	10510	72.5	10580	73.0	10580	73.0	6090	42.0		
		38.00	56.55	0.540	13.72	12800	88.3	11480	79.1	10510	72.5	11030	76.0	11110	76.6	6090	42.0		

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-EP-C90-1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	8350	57.6	9240	63.7	9240	63.7	9240	63.7	9240	63.7	9240	63.7
		13.50	20.09	0.290	7.37	10500	72.4	10710	73.9	10710	73.9	10710	73.9	10710	73.9	9620	66.3
		15.10	22.47	0.337	8.56	12800	88.3	12450	85.8	12450	85.8	12450	85.8	11750	81.0	9620	66.3
5	127.00	15.00	22.32	0.296	7.52	9300	64.1	9840	67.9	9840	67.9	9840	67.9	9840	67.9	8860	61.1
		18.00	26.79	0.362	9.19	12250	84.5	12040	82.9	12040	82.9	11550	79.6	11770	81.2	8860	61.1
		21.40	31.85	0.437	11.10	15400	106.2	14530	100.2	14020	96.7	14240	98.2	11770	81.2	8860	61.1
		23.20	34.53	0.478	12.14	17100	117.9	15890	109.6	14020	96.7	14240	98.2	11770	81.2	8860	61.1
		24.10	35.86	0.500	12.70	18000	124.1	16220	111.9	14020	96.7	14240	98.2	11770	81.2	8860	61.1
5 1/2	139.70	17.00	25.30	0.304	7.72	8300	57.2	9190	63.3	9190	63.3	9190	63.3	9190	63.3	8170	56.3
		20.00	29.76	0.361	9.17	10800	74.5	10910	75.2	10910	75.2	10580	73.0	10680	73.7	8170	56.3
		23.00	34.23	0.415	10.54	12900	88.9	12540	86.5	12540	86.5	12540	86.5	10680	73.7	8170	56.3
		26.00	38.69	0.476	12.09	15120	104.2	14390	99.2	12820	88.4	13400	92.4	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8.94	7700	53.1	8830	60.9	8830	60.9	8830	60.9	8830	60.9	7020	48.4
		28.00	41.67	0.417	10.59	10150	70.0	10460	72.1	10460	72.1	10460	72.1	10460	72.1	7020	48.4
		32.00	47.62	0.475	12.06	12200	84.1	11920	82.1	11920	82.1	11560	79.7	11660	80.4	7020	48.4
7	177.80	23.00	34.23	0.317	8.05	5500	37.9	7530	51.9	7530	51.9	7530	51.9	7530	51.9	6810	46.9
		26.00	38.69	0.362	9.19	7350	50.7	8600	59.2	8600	59.2	8600	59.2	8600	59.2	6810	46.9
		29.00	43.16	0.408	10.36	9050	62.4	9690	66.8	9690	66.8	9690	66.8	9690	66.8	6810	46.9
		32.00	47.62	0.453	11.51	10600	73.1	10760	74.2	10760	74.2	10760	74.2	10760	74.2	6810	46.9
		35.00	52.09	0.498	12.65	12000	82.7	11830	81.6	11750	81.0	11830	81.6	11830	81.6	6810	46.9
		38.00	56.55	0.540	13.72	13300	91.7	12830	88.5	11750	81.0	12320	85.0	12410	85.6	6810	46.9

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

VA-EP-L80-1																					
				COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE															
SC		LC		all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC			
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
8260	57.0	8260	57.0	7800	53.8	8260	57.0	8260	57.0	8260	57.0	8260	57.0	8260	57.0	8260	57.0	8260	57.0	8260	57.0
9590	66.1	9590	66.1	9650	66.5	9590	66.1	9590	66.1	9590	66.1	9590	66.1	9590	66.1	8600	59.3	9590	66.1	9590	66.1
10920	75.3	11140	76.8	11650	80.3	11140	76.8	11140	76.8	11140	76.8	11140	76.8	10520	72.5	8600	59.3	10920	75.3	11140	76.8
8810	60.7	8810	60.7	8600	59.3	8810	60.7	8810	60.7	8810	60.7	8810	60.7	8810	60.7	7930	54.6	8810	60.7	8810	60.7
10770	74.2	10770	74.2	11200	77.2	10770	74.2	10770	74.2	10330	71.2	10530	72.6	7930	54.6	10770	74.2	10770	74.2	10770	74.2
10900	75.1	11490	79.2	13400	92.4	13000	89.6	12540	86.5	12740	87.8	10530	72.6	7930	54.6	10900	75.1	11490	79.2	10900	75.1
10900	75.1	11490	79.2	15500	106.9	14220	98.0	12540	86.5	12740	87.8	10530	72.6	7930	54.6	10900	75.1	11490	79.2	10900	75.1
10900	75.1	11490	79.2	16300	112.4	14520	100.1	12540	86.5	12740	87.8	10530	72.6	7930	54.6	10900	75.1	11490	79.2	10900	75.1
8220	56.7	8220	56.7	7700	53.1	8220	56.7	8220	56.7	8220	56.7	8220	56.7	7310	50.4	8220	56.7	8220	56.7	8220	56.7
9760	67.3	9760	67.3	9900	68.3	9760	67.3	9760	67.3	9470	65.3	9560	65.9	7310	50.4	9760	67.3	9760	67.3	9760	67.3
9950	68.6	10500	72.4	11750	81.0	11220	77.4	11220	77.4	11220	77.4	9560	65.9	7310	50.4	9950	68.6	10500	72.4	10500	72.4
-	-	-	-	13670	94.3	12860	88.7	11470	79.1	11980	82.6	-	-	-	-	-	-	-	-	-	-
7900	54.5	7900	54.5	7250	50.0	7900	54.5	7900	54.5	7900	54.5	7900	54.5	6280	43.3	7900	54.5	7900	54.5	7900	54.5
9360	64.5	9360	64.5	9350	64.5	9360	64.5	9360	64.5	9360	64.5	9360	64.5	6280	43.3	9360	64.5	9360	64.5	9360	64.5
10670	73.5	10670	73.5	11050	76.2	10670	73.5	10670	73.5	10350	71.3	10430	71.9	6280	43.3	10670	73.5	10670	73.5	10670	73.5
6740	46.4	6740	46.4	5300	36.5	6740	46.4	6740	46.4	6740	46.4	6740	46.4	6090	42.0	6740	46.4	6740	46.4	6740	46.4
7690	53.0	7690	53.0	6900	47.6	7690	53.0	7690	53.0	7690	53.0	7690	53.0	6090	42.0	7690	53.0	7690	53.0	7690	53.0
8670	59.8	8670	59.8	8350	57.6	8670	59.8	8670	59.8	8670	59.8	8670	59.8	6090	42.0	8670	59.8	8670	59.8	8670	59.8
9630	66.4	9630	66.4	9700	66.9	9630	66.4	9630	66.4	9630	66.4	9630	66.4	6090	42.0	9630	66.4	9630	66.4	9630	66.4
10580	73.0	10580	73.0	10950	75.5	10580	73.0	10510	72.5	10580	73.0	10580	73.0	6090	42.0	10580	73.0	10580	73.0	10580	73.0
11320	78.0	11480	79.1	12100	83.4	11480	79.1	10510	72.5	11030	76.0	11110	76.6	6090	42.0	11320	78.0	11480	79.1	11480	79.1

VA-EP-R95																					
				COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE															
SC		LC		all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC			
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
9240	63.7	9240	63.7	9000	62.1	9720	67.0	9720	67.0	9720	67.0	9720	67.0	9720	67.0	9720	67.0	9720	67.0	9720	67.0
10710	73.9	10710	73.9	11600	80.0	11280	77.7	11280	77.7	11280	77.7	11280	77.7	10120	69.7	11280	77.7	11280	77.7	11280	77.7
12210	84.2	12450	85.8	14250	98.3	13110	90.3	13110	90.3	13110	90.3	12370	85.2	10120	69.7	12850	88.5	13110	90.3	13110	90.3
9840	67.9	9840	67.9	10100	69.6	10360	71.4	10360	71.4	10360	71.4	10360	71.4	9330	64.3	10360	71.4	10360	71.4	10360	71.4
12040	82.9	12040	82.9	13600	93.8	12670	87.3	12670	87.3	12160	83.8	12390	85.4	9330	64.3	12670	87.3	12670	87.3	12670	87.3
12180	84.0	12850	88.6	17250	118.9	15300	105.4	14760	101.7	14990	103.3	12390	85.4	9330	64.3	12820	88.3	13520	93.2	13520	93.2
12180	84.0	12850	88.6	19150	132.0	16730	115.3	14760	101.7	14990	103.3	12390	85.4	9330	64.3	12820	88.3	13520	93.2	13520	93.2
12180	84.0	12850	88.6	20150	138.9	17080	117.7	14760	101.7	14990	103.3	12390	85.4	9330	64.3	12820	88.3	13520	93.2	13520	93.2
9190	63.3	9190	63.3	8950	61.7	9670	66.6	9670	66.6	9670	66.6	9670	66.6	8600	59.2	9670	66.6	9670	66.6	9670	66.6
10910	75.2	10910	75.2	11900	82.1	11490	79.1	11490	79.1	11140	76.7	11240	77.5	8600	59.2	11490	79.1	11490	79.1	11490	79.1
11120	76.7	11730	80.9	14400	99.3	13200	91.0	13200	91.0	13200	91.0	11240	77.5	8600	59.2	11700	80.6	12350	85.1	12350	85.1
-	-	-	-	17290	119.2	15130	104.3	13490	93.0	14100	97.2	-	-	-	-	-	-	-	-	-	-
8830	60.9	8830	60.9	8250	56.9	9300	64.1	9300	64.1	9300	64.1	9300	64.1	7390	50.9	9300	64.1	9300	64.1	9300	64.1
10460	72.1	10460	72.1	11150	76.9	11020	75.9	11020	75.9	11020	75.9	11020	75.9	7390	50.9	11020	75.9	11020	75.9	11020	75.9
11920	82.1	11920	82.1	13450	92.7	12550	86.4	12550	86.4	12170	83.9	12280	84.6	7390	50.9	12550	86.4	12550	86.4	12550	86.4
7530	51.9	7530	51.9	5800	40.0	7930	54.6	7930	54.6	7930	54.6	7930	54.6	7170	49.4	7930	54.6	7930	54.6	7930	54.6
8600	59.2	8600	59.2	7800	53.8	9050	62.3	9050	62.3	9050	62.3	9050	62.3	7170	49.4	9050	62.3	9050	62.3	9050	62.3
9690	66.8	9690	66.8	9850	67.9	10200	70.3	10200	70.3	10200	70.3	10200	70.3	7170	49.4	10200	70.3	10200	70.3	10200	70.3
10760	74.2	10760	74.2	11650	80.3	11330	78.1	11330	78.1	11330	78.1	11330	78.1	7170	49.4	11330	78.1	11330	78.1	11330	78.1
11830	81.6	11830	81.6	13300	91.7	12450	85.8	12370	85.2	12450	85.8	12450	85.8	7170	49.4	12450	85.8	12450	85.8	12450	85.8
12650	87.2	12830	88.5	14800	102.0	13500	93.0	12370	85.2	12970	89.4	13070	90.0	7170	49.4	13320	91.8	13500	93.0	13500	93.0

DIMENSION (STANDARD DRIFT SIZE)

VA-EP-T95-1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11,60	17.26	0.250	6,35	8650	59.6	9720	67.0	9720	67.0	9720	67.0	9720	67.0	9720	67.0
		13.50	20,09	0.290	7,37	11000	75.8	11280	77.7	11280	77.7	11280	77.7	11280	77.7	10120	69.7
		15,10	22.47	0.337	8,56	13450	92.7	13110	90.3	13110	90.3	13110	90.3	12370	85.2	10120	69.7
5	127.00	15,00	22.32	0.296	7,52	9650	66.5	10360	71.4	10360	71.4	10360	71.4	10360	71.4	9330	64.3
		18,00	26.79	0.362	9,19	12850	88.6	12670	87.3	12670	87.3	12160	83.8	12390	85.4	9330	64.3
		21,40	31.85	0.437	11,10	16200	111.7	15300	105.4	14760	101.7	14990	103.3	12390	85.4	9330	64.3
		23,20	34.53	0.478	12,14	18000	124.1	16730	115.3	14760	101.7	14990	103.3	12390	85.4	9330	64.3
		24,10	35.86	0.500	12,70	18900	130.3	17080	117.7	14760	101.7	14990	103.3	12390	85.4	9330	64.3
5 1/2	139.70	17,00	25.30	0.304	7,72	8600	59.3	9670	66.6	9670	66.6	9670	66.6	9670	66.6	8600	59.2
		20,00	29.76	0.361	9,17	11250	77.6	11490	79.1	11490	79.1	11140	76.7	11240	77.5	8600	59.2
		23,00	34.23	0.415	10,54	13550	93.4	13200	91.0	13200	91.0	13200	91.0	11240	77.5	8600	59.2
		26,00	38.69	0.476	12,09	15980	110.2	15160	104.5	13490	93.0	14100	97.2	-	-	-	-
6 5/8	168.28	24,00	35.72	0.352	8,94	7950	54.8	9300	64.1	9300	64.1	9300	64.1	9300	64.1	7390	50.9
		28,00	41.67	0.417	10,59	10650	73.4	11020	75.9	11020	75.9	11020	75.9	11020	75.9	7390	50.9
		32,00	47.62	0.475	12,06	12700	87.6	12550	86.4	12550	86.4	12170	83.9	12280	84.6	7390	50.9
7	177.80	23,00	34.23	0.317	8,05	5600	38.6	7930	54.6	7930	54.6	7930	54.6	7930	54.6	7170	49.4
		26,00	38.69	0.362	9,19	7550	52.1	9050	62.3	9050	62.3	9050	62.3	9050	62.3	7170	49.4
		29,00	43.16	0.408	10,36	9400	64.8	10200	70.3	10200	70.3	10200	70.3	10200	70.3	7170	49.4
		32,00	47.62	0.453	11,51	11050	76.2	11330	78.1	11330	78.1	11330	78.1	11330	78.1	7170	49.4
		35,00	52.09	0.498	12,65	12550	86.5	12450	85.8	12370	85.2	12450	85.8	12450	85.8	7170	49.4
		38,00	56.55	0.540	13,72	13950	96.2	13500	93.0	12370	85.2	12970	89.4	13070	90.0	7170	49.4

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-EP-P110

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11,60	17.26	0.250	6,35	9750	67.2	12150	83.8	12150	83.8	12150	83.8	12150	83.8	12150	83.8
		13.50	20,09	0.290	7,37	12950	89.3	14100	97.3	14100	97.3	14100	97.3	14100	97.3	12650	87.2
		15,10	22.47	0.337	8,56	16200	111.7	16380	113.0	16380	113.0	16380	113.0	15460	106.6	12650	87.2
5	127.00	15,00	22.32	0.296	7,52	11100	76.5	12950	89.3	12950	89.3	12950	89.3	12950	89.3	11660	80.4
		18,00	26.79	0.362	9,19	15450	106.5	15840	109.2	15840	109.2	15200	104.8	15490	106.8	11660	80.4
		21,40	31.85	0.437	11,10	19800	136.5	19120	131.8	18440	127.2	18730	129.2	15490	106.8	11660	80.4
		23,20	34.53	0.478	12,14	22050	152.0	20910	144.2	18440	127.2	18730	129.2	15490	106.8	11660	80.4
		24,10	35.86	0.500	12,70	23250	160.3	21350	147.2	18440	127.2	18730	129.2	15490	106.8	11660	80.4
5 1/2	139.70	17,00	25.30	0.304	7,72	9650	66.5	12090	83.4	12090	83.4	12090	83.4	12090	83.4	10750	74.1
		20,00	29.76	0.361	9,17	13300	91.7	14360	99.0	14360	99.0	13920	96.0	14060	96.9	10750	74.1
		23,00	34.23	0.415	10,54	16350	112.7	16510	113.8	16510	113.8	16510	113.8	14060	96.9	10750	74.1
		26,00	38.69	0.476	12,09	19710	135.9	18930	130.5	16880	116.4	17620	121.5	-	-	-	-
6 5/8	168.28	24,00	35.72	0.352	8,94	8950	61.7	11620	80.1	11620	80.1	11620	80.1	11620	80.1	9230	63.7
		28,00	41.67	0.417	10,59	13000	89.6	13770	94.9	13770	94.9	13770	94.9	13770	94.9	9230	63.7
		32,00	47.62	0.475	12,06	15200	104.8	15680	108.1	15680	108.1	15220	104.9	15340	105.8	9230	63.7
7	177.80	23,00	34.23	0.317	8,05	5950	41.0	9910	68.3	9910	68.3	9910	68.3	9910	68.3	8960	61.8
		26,00	38.69	0.362	9,19	8700	60.0	11310	78.0	11310	78.0	11310	78.0	11310	78.0	8960	61.8
		29,00	43.16	0.408	10,36	10750	74.1	12750	87.9	12750	87.9	12750	87.9	12750	87.9	8960	61.8
		32,00	47.62	0.453	11,51	13000	89.6	14160	97.7	14160	97.7	14160	97.7	14160	97.7	8960	61.8
		35,00	52.09	0.498	12,65	15050	103.8	15560	107.3	15460	106.6	15560	107.3	15560	107.3	8960	61.8
		38,00	56.55	0.540	13,72	16850	116.2	16880	116.4	15460	106.6	16220	111.8	16330	112.6	8960	61.8

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread



VA-EP-C110																				
				COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE														
SC		LC		all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC		
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	
9720	67.0	9720	67.0	9500	65.5	11610	80.0	11610	80.0	11610	80.0	11610	80.0	11130	76.7	11610	80.0	11610	80.0	
11280	77.7	11280	77.7	12450	85.8	13470	92.9	13470	92.9	13310	91.7	13470	92.9	11130	76.7	13470	92.9	13470	92.9	
12850	88.5	13110	90.3	15500	106.9	15650	107.9	14620	100.8	15650	107.9	13610	93.8	11130	76.7	14130	97.4	14650	100.9	
10360	71.4	10360	71.4	10750	74.1	12370	85.3	12370	85.3	12370	85.3	12370	85.3	10260	70.7	12370	85.3	12370	85.3	
12670	87.3	12670	87.3	14750	101.7	15130	104.2	15130	104.2	13370	92.2	13630	93.9	10260	70.7	14100	97.2	14880	102.5	
12820	88.3	13520	93.2	18850	130.0	18270	125.9	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5	
12820	88.3	13520	93.2	20950	144.5	18780	129.4	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5	
12820	88.3	13520	93.2	22100	152.4	19250	132.7	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5	
9670	66.6	9670	66.6	9400	64.8	11550	79.6	11550	79.6	11550	79.6	11550	79.6	9460	65.2	11550	79.6	11550	79.6	
11490	79.1	11490	79.1	12850	88.6	13720	94.5	13720	94.5	12250	84.4	12370	85.2	9460	65.2	12870	88.7	13580	93.6	
11700	80.6	12350	85.1	15650	107.9	15770	108.7	14840	102.3	15500	106.9	12370	85.2	9460	65.2	12870	88.7	13580	93.6	
-	-	-	-	18820	129.8	17580	121.2	14840	102.3	15500	106.9	-	-	-	-	-	-	-	-	
9300	64.1	9300	64.1	8650	59.6	11100	76.5	11100	76.5	11100	76.5	11100	76.5	8120	56.0	11100	76.5	11100	76.5	
11020	75.9	11020	75.9	11950	82.4	13160	90.6	13160	90.6	13160	90.6	13160	90.6	8120	56.0	13160	90.6	13160	90.6	
12550	86.4	12550	86.4	14550	100.3	14980	103.2	14980	103.2	13390	92.3	13500	93.0	8120	56.0	13970	96.3	14670	101.1	
7930	54.6	7930	54.6	5900	40.7	9460	65.2	9460	65.2	9460	65.2	9460	65.2	7880	54.3	9460	65.2	9460	65.2	
9050	62.3	9050	62.3	8450	58.3	10810	74.4	10810	74.4	10810	74.4	10810	74.4	7880	54.3	10810	74.4	10810	74.4	
10200	70.3	10200	70.3	10450	72.1	12180	83.9	12180	83.9	12180	83.9	12180	83.9	7880	54.3	12180	83.9	12180	83.9	
11330	78.1	11330	78.1	12500	86.2	13530	93.2	13530	93.2	13530	93.2	13530	93.2	7880	54.3	13530	93.2	13530	93.2	
12450	85.8	12450	85.8	14400	99.3	14870	102.5	13600	93.7	14270	98.3	14370	99.0	7880	54.3	14650	101.0	14870	102.5	
13320	91.8	13500	93.0	16100	111.0	15910	109.7	13600	93.7	14270	98.3	14370	99.0	7880	54.3	14650	101.0	15410	106.2	

VA-EP-Q125-1																				
				COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE														
SC		LC		all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC		
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	
12150	83.8	12150	83.8	10250	70.7	13130	90.5	13130	90.5	13130	90.5	13130	90.5	13130	90.5	13130	90.5	13130	90.5	
14100	97.3	14100	97.3	13900	95.8	15230	105.1	15230	105.1	15230	105.1	15230	105.1	13660	94.2	15230	105.1	15230	105.1	
16060	110.8	16380	113.0	17700	122.0	17690	122.0	17690	122.0	17690	122.0	16700	115.4	13660	94.2	17350	119.6	17690	122.0	
12950	89.3	12950	89.3	11800	81.4	13990	96.5	13990	96.5	13990	96.5	13990	96.5	12590	86.8	13990	96.5	13990	96.5	
15840	109.2	15840	109.2	16800	115.8	17100	117.9	17100	117.9	16410	113.2	16730	115.4	12590	86.8	17100	117.9	17100	117.9	
16030	110.5	16900	116.6	21800	150.3	20650	142.4	19920	137.4	20230	139.5	16730	115.4	12590	86.8	17310	119.4	18260	125.9	
16030	110.5	16900	116.6	24350	167.9	22590	155.7	19920	137.4	20230	139.5	16730	115.4	12590	86.8	17310	119.4	18260	125.9	
16030	110.5	16900	116.6	25700	177.2	23050	159.0	19920	137.4	20230	139.5	16730	115.4	12590	86.8	17310	119.4	18260	125.9	
12090	83.4	12090	83.4	10150	70.0	13060	90.0	13060	90.0	13060	90.0	13060	90.0	11610	80.0	13060	90.0	13060	90.0	
14360	99.0	14360	99.0	14400	99.3	15510	106.9	15510	106.9	15040	103.7	15180	104.7	11610	80.0	15510	106.9	15510	106.9	
14630	100.9	15440	106.5	17900	123.4	17830	122.9	17830	122.9	17830	122.9	15180	104.7	11610	80.0	15800	109.0	16670	115.0	
-	-	-	-	21970	151.5	20450	141.0	18230	125.7	19040	131.3	-	-	-	-	-	-	-	-	
11620	80.1	11620	80.1	9450	65.2	12550	86.6	12550	86.6	12550	86.6	12550	86.6	9970	68.8	12550	86.6	12550	86.6	
13770	94.9	13770	94.9	13250	91.4	14870	102.5	14870	102.5	14870	102.5	14870	102.5	9970	68.8	14870	102.5	14870	102.5	
15680	108.1	15680	108.1	16550	114.1	16940	116.8	16940	116.8	16430	113.3	16570	114.3	9970	68.8	16940	116.8	16940	116.8	
9910	68.3	9910	68.3	6100	42.1	10700	73.8	10700	73.8	10700	73.8	10700	73.8	9680	66.7	10700	73.8	10700	73.8	
11310	78.0	11310	78.0	8750	60.3	12220	84.2	12220	84.2	12220	84.2	12220	84.2	9680	66.7	12220	84.2	12220	84.2	
12750	87.9	12750	87.9	11400	78.6	13770	94.9	13770	94.9	13770	94.9	13770	94.9	9680	66.7	13770	94.9	13770	94.9	
14160	97.7	14160	97.7	14000	96.5	15290	105.5	15290	105.5	15290	105.5	15290	105.5	9680	66.7	15290	105.5	15290	105.5	
15560	107.3	15560	107.3	16350	112.7	16810	115.9	16690	115.1	16810	115.9	16810	115.9	9680	66.7	16810	115.9	16810	115.9	
16650	114.8	16880	116.4	18500	127.6	18230	125.7	16690	115.1	17510	120.8	17640	121.6	9680	66.7	17980	124.0	18230	125.7	

# VA – EXTREME PROPERTIES – SERIES

Seamless Casing complying with API specification 5CT with extreme properties for higher collapse and burst values than standard API grades (TR 5C3) and exceeding the values of EP-grades.

## Marking

According to API specification 5CT plus additional marking of “VA-XP-...” (... stands e.g. for N80-Q or L80-1 etc.). Upon request API monogram will be applied.

## Mechanical properties and chemical composition

According to API specification 5CT. All grades are subject to hot rotary straightening.

## Inspection and testing

According to API specification 5CT. All pipes are subject to a 100% coverage ultrasonic testing inspection for wall thickness (min. 95% average wall).



### NON-DESTRUCTIVE TESTING

Flux Leakage Inspection (Pipe Body)	Ultrasonic Inspection (Pipe Body)	Magnetic Particle Inspection (Pipe Ends)	Acceptance (inspection) levels		Remark
			Internal Longitudinal & Transverse	External Longitudinal & Transverse	
A	A	R	L2 (5 % nWT)	L2 (5 % nWT)	*
B	C	R	L2 (5 % nWT)	L2 (5 % nWT)	**
*** P110 to A.10 SR16 impact testing (Charpy V-notch)			L4 (12.5 % nWT)	L4 (12.5 % nWT)	***

- A one method or a combination of methods at manufacturer's option shall be used in addition to ultrasonic inspection to inspect the outside surface
- B shall be used in addition to ultrasonic inspection to inspect the outside surface
- C Ultrasonic inspection shall be used to inspect the outside and inside surface
- R required
- nWT nominal Wall Thickness
- \* VA-XP-N80-Q / VA-XP-L80-1 / VA-XP-R95 / VA-XP-P110
- \*\* VA-XP-C90-1 / VA-XP-T95-1 / VA-XP-C110 / VA-XP-Q125-1
- \*\*\* On customer request VA-XP-P110 can be delivered with NDT acceptance levels corresponding to API specification 5CT, grade P110 to A.10 SR16 impact testing (Charpy V-notch).
- L... acceptance level

### DIMENSION (STANDARD DRIFT SIZE)

OUTSIDE DIAMETER						VA-XP-L80-1															
						WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
										all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa				
4 1/2	114.30	11.60	17.26	0.250	6.35	8190	56.5	8970	61.9	8970	61.9	8970	61.9	8970	61.9	8970	61.9	8600	59.3		
		13.50	20.09	0.290	7.37	10130	69.8	10410	71.8	10410	71.8	10290	70.9	10410	71.8	8600	59.3				
		15.10	22.47	0.337	8.56	12230	84.3	12090	83.4	11300	77.9	12090	83.4	10520	72.5	8600	59.3				
5	127.00	15.00	22.32	0.296	7.52	9030	62.3	9560	65.9	9560	65.9	9560	65.9	9560	65.9	7930	54.6				
		18.00	26.79	0.362	9.19	11760	81.1	11690	80.6	11690	80.6	10330	71.2	10530	72.6	7930	54.6				
		21.40	31.85	0.437	11.10	14070	97.0	14120	97.3	12540	86.5	12740	87.8	10530	72.6	7930	54.6				
		23.20	34.53	0.478	12.14	16280	112.3	14520	100.1	12540	86.5	12740	87.8	10530	72.6	7930	54.6				
		24.10	35.86	0.500	12.70	17120	118.0	14520	100.1	12540	86.5	12740	87.8	10530	72.6	7930	54.6				
5 1/2	139.70	17.00	25.30	0.304	7.72	8090	55.8	8930	61.5	8930	61.5	8930	61.5	8930	61.5	7310	50.4				
		20.00	29.76	0.361	9.17	10400	71.7	10600	73.1	10600	73.1	9470	65.3	9560	65.9	7310	50.4				
		23.00	34.23	0.415	10.54	12340	85.1	12190	84.0	11470	79.1	11980	82.6	9560	65.9	7310	50.4				
		26.00	38.69	0.476	12.09	14350	98.9	13590	93.7	11470	79.1	11980	82.6	-	-	-	-				
6 5/8	168.28	24.00	35.72	0.352	8.94	7610	52.5	8580	59.2	8580	59.2	8580	59.2	8580	59.2	6280	43.3				
		28.00	41.67	0.417	10.59	9820	67.7	10170	70.1	10170	70.1	10170	70.1	10170	70.1	6280	43.3				
		32.00	47.62	0.475	12.06	11600	80.0	11580	79.8	11580	79.8	10350	71.3	10430	71.9	6280	43.3				
7	177.80	23.00	34.23	0.317	8.05	5570	38.4	7310	50.4	7310	50.4	7310	50.4	7310	50.4	6090	42.0				
		26.00	38.69	0.362	9.19	7250	50.0	8350	57.5	8350	57.5	8350	57.5	8350	57.5	6090	42.0				
		29.00	43.16	0.408	10.36	8770	60.5	9410	64.9	9410	64.9	9410	64.9	9410	64.9	6090	42.0				
		32.00	47.62	0.453	11.51	10190	70.3	10450	72.1	10450	72.1	10450	72.1	10450	72.1	6090	42.0				
		35.00	52.09	0.498	12.65	11500	79.3	11490	79.2	10510	72.5	11030	76.0	11110	76.6	6090	42.0				
		38.00	56.55	0.540	13.72	12710	87.6	12300	84.8	10510	72.5	11030	76.0	11110	76.6	6090	42.0				

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-XP-N80-Q

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE															
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC			
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
4 ½	114.30	11,60	17.26	0.250	6,35	8300	57.2	8970	61.9	8970	61.9	8970	61.9	8970	61.9	8600	59.3	8970	61.9	8970	61.9	8970	61.9
		13.50	20.09	0.290	7,37	10500	72.4	10410	71.8	10410	71.8	10290	70.9	10410	71.8	8600	59.3	10410	71.8	10410	71.8	10410	71.8
		15,10	22.47	0.337	8,56	12920	89.1	12090	83.4	11300	77.9	12090	83.4	10520	72.5	8600	59.3	10920	75.3	11320	78.0	11320	78.0
5	127.00	15.00	22.32	0.296	7,52	9240	63.7	9560	65.9	9560	65.9	9560	65.9	9560	65.9	7930	54.6	9560	65.9	9560	65.9	9560	65.9
		18.00	26.79	0.362	9,19	12340	85.1	11690	80.6	11690	80.6	10330	71.2	10530	72.6	7930	54.6	10900	75.1	11490	79.2	11490	79.2
		21.40	31.85	0.437	11,10	15700	108.3	14120	97.3	12540	86.5	12740	87.8	10530	72.6	7930	54.6	10900	75.1	11490	79.2	11490	79.2
		23.20	34.53	0.478	12,14	17430	120.2	14520	100.1	12540	86.5	12740	87.8	10530	72.6	7930	54.6	10900	75.1	11490	79.2	11490	79.2
		24,10	35.86	0.500	12,70	18380	126.7	14520	100.1	12540	86.5	12740	87.8	10530	72.6	7930	54.6	10900	75.1	11490	79.2	11490	79.2
5 ½	139.70	17.00	25.30	0.304	7,72	8190	56.5	8930	61.5	8930	61.5	8930	61.5	8930	61.5	7310	50.4	8930	61.5	8930	61.5	8930	61.5
		20.00	29.76	0.361	9,17	10760	74.2	10600	73.1	10600	73.1	9470	65.3	9560	65.9	7310	50.4	9950	68.6	10500	72.4	10500	72.4
		23.00	34.23	0.415	10,54	13070	90.1	12190	84.0	11470	79.1	11980	82.6	9560	65.9	7310	50.4	9950	68.6	10500	72.4	10500	72.4
		26.00	38.69	0.476	12,09	15270	105.3	13590	93.7	11470	79.1	11980	82.6	-	-	-	-	-	-	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8,94	7670	52.9	8580	59.2	8580	59.2	8580	59.2	8580	59.2	6280	43.3	8580	59.2	8580	59.2	8580	59.2
		28.00	41.67	0.417	10,59	10130	69.8	10170	70.1	10170	70.1	10170	70.1	10170	70.1	6280	43.3	10170	70.1	10170	70.1	10170	70.1
		32.00	47.62	0.475	12,06	12180	84.0	11580	79.8	11580	79.8	10350	71.3	10430	71.9	6280	43.3	10800	74.4	11340	78.2	11340	78.2
7	177.80	23.00	34.23	0.317	8,05	5780	39.9	7310	50.4	7310	50.4	7310	50.4	7310	50.4	6090	42.0	7310	50.4	7310	50.4	7310	50.4
		26.00	38.69	0.362	9,19	7300	50.3	8350	57.5	8350	57.5	8350	57.5	8350	57.5	6090	42.0	8350	57.5	8350	57.5	8350	57.5
		29.00	43.16	0.408	10,36	8980	61.9	9410	64.9	9410	64.9	9410	64.9	9410	64.9	6090	42.0	9410	64.9	9410	64.9	9410	64.9
		32.00	47.62	0.453	11,51	10550	72.7	10450	72.1	10450	72.1	10450	72.1	10450	72.1	6090	42.0	10450	72.1	10450	72.1	10450	72.1
		35.00	52.09	0.498	12,65	12080	83.3	11490	79.2	10510	72.5	11030	76.0	11110	76.6	6090	42.0	11320	78.0	11490	79.2	11490	79.2
		38.00	56.55	0.540	13,72	13440	92.7	12300	84.8	10510	72.5	11030	76.0	11110	76.6	6090	42.0	11320	78.0	11910	82.1	11910	82.1

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

VA-XP-C90-1

SC		LC		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE																	
				all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC					
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
8970	61.9	8970	61.9	8770	60.5	10030	69.1	10030	69.1	10030	69.1	10030	69.1	10030	69.1	9620	66.3	10030	69.1	10030	69.1	10030	69.1
10410	71.8	10410	71.8	11030	76.1	11630	80.2	11630	80.2	11500	79.3	11630	80.2	11630	80.2	9620	66.3	11630	80.2	11630	80.2	11630	80.2
10920	75.3	11320	78.0	13440	92.7	13520	93.2	12630	87.1	13520	93.2	11750	81.0	9620	66.3	12210	84.2	12650	87.2	12650	87.2	12650	87.2
9560	65.9	9560	65.9	9770	67.4	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	8860	61.1	10690	73.7	10690	73.7	10690	73.7
10900	75.1	11490	79.2	12860	88.7	13070	90.1	13070	90.1	11550	79.6	11770	81.2	8860	61.1	12180	84.0	12850	88.6	12850	88.6	12850	88.6
10900	75.1	11490	79.2	16170	111.5	15780	108.8	14020	96.7	14240	98.2	11770	81.2	8860	61.1	12180	84.0	12850	88.6	12850	88.6	12850	88.6
10900	75.1	11490	79.2	17960	123.8	16220	111.9	14020	96.7	14240	98.2	11770	81.2	8860	61.1	12180	84.0	12850	88.6	12850	88.6	12850	88.6
10900	75.1	11490	79.2	18900	130.3	16220	111.9	14020	96.7	14240	98.2	11770	81.2	8860	61.1	12180	84.0	12850	88.6	12850	88.6	12850	88.6
8930	61.5	8930	61.5	8720	60.1	9980	68.8	9980	68.8	9980	68.8	9980	68.8	9980	68.8	8170	56.3	9980	68.8	9980	68.8	9980	68.8
9950	68.6	10500	72.4	11340	78.2	11850	81.7	11850	81.7	10580	73.0	10680	73.7	8170	56.3	11120	76.7	11730	80.9	11730	80.9	11730	80.9
9950	68.6	10500	72.4	13550	93.4	13620	93.9	12820	88.4	13400	92.4	10680	73.7	8170	56.3	11120	76.7	11730	80.9	11730	80.9	11730	80.9
-	-	-	-	15880	109.5	15200	104.8	12820	88.4	13400	92.4	-	-	-	-	-	-	-	-	-	-	-	
8580	59.2	8580	59.2	8090	55.8	9590	66.1	9590	66.1	9590	66.1	9590	66.1	9590	66.1	7020	48.4	9590	66.1	9590	66.1	9590	66.1
10170	70.1	10170	70.1	10660	73.5	11360	78.3	11360	78.3	11360	78.3	11360	78.3	11360	78.3	7020	48.4	11360	78.3	11360	78.3	11360	78.3
10800	74.4	11340	78.2	12810	88.3	12940	89.2	12940	89.2	11560	79.7	11660	80.4	7020	48.4	12070	83.2	12670	87.4	12670	87.4	12670	87.4
7310	50.4	7310	50.4	5780	39.9	8170	56.3	8170	56.3	8170	56.3	8170	56.3	8170	56.3	6810	46.9	8170	56.3	8170	56.3	8170	56.3
8350	57.5	8350	57.5	7720	53.2	9330	64.3	9330	64.3	9330	64.3	9330	64.3	9330	64.3	6810	46.9	9330	64.3	9330	64.3	9330	64.3
9410	64.9	9410	64.9	9500	65.5	10520	72.5	10520	72.5	10520	72.5	10520	72.5	10520	72.5	6810	46.9	10520	72.5	10520	72.5	10520	72.5
10450	72.1	10450	72.1	11130	76.7	11680	80.6	11680	80.6	11680	80.6	11680	80.6	11680	80.6	6810	46.9	11680	80.6	11680	80.6	11680	80.6
11320	78.0	11490	79.2	12600	86.9	12840	88.5	11750	81.0	12320	85.0	12410	85.6	6810	46.9	12650	87.2	12840	88.5	12840	88.5	12840	88.5
11320	78.0	11910	82.1	13970	96.3	13740	94.8	11750	81.0	12320	85.0	12410	85.6	6810	46.9	12650	87.2	13310	91.8	13310	91.8	13310	91.8

Other performance properties as listed in API TR 5C3 (see appendix). Collapse performance numbers guaranteed on a statistical database. Collapse testing is done at the decision of VAT or if required by customer with a frequency of 1 sample (min. length is 8 times the outside diameter) per heat treatment lot. Higher collapse values or collapse values for special drift diameters on request.

DIMENSION (STANDARD DRIFT SIZE)

VA-XP-R95-1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	9450	65.2	10560	72.7	10560	72.7	10560	72.7	10560	72.7	10120	69.7
		13.50	20.09	0.290	7.37	12180	84.0	12240	84.4	12240	84.4	12100	83.4	12240	84.4	10120	69.7
		15.10	22.47	0.337	8.56	14960	103.1	14230	98.0	13290	91.6	14230	98.0	12370	85.2	10120	69.7
5	127.00	15.00	22.32	0.296	7.52	10610	73.2	11250	77.5	11250	77.5	11250	77.5	11250	77.5	9330	64.3
		18.00	26.79	0.362	9.19	14280	98.5	13760	94.7	13760	94.7	12160	83.8	12390	85.4	9330	64.3
		21.40	31.85	0.437	11.10	18110	124.9	16610	114.4	14760	101.7	14990	103.3	12390	85.4	9330	64.3
		23.20	34.53	0.478	12.14	20110	138.7	17080	117.7	14760	101.7	14990	103.3	12390	85.4	9330	64.3
		24.10	35.86	0.500	12.70	21160	145.9	17080	117.7	14760	101.7	14990	103.3	12390	85.4	9330	64.3
5 1/2	139.70	17.00	25.30	0.304	7.72	9400	64.8	10500	72.3	10500	72.3	10500	72.3	10500	72.3	8600	59.2
		20.00	29.76	0.361	9.17	12500	86.2	12470	85.9	12470	85.9	11140	76.7	11240	77.5	8600	59.2
		23.00	34.23	0.415	10.54	15120	104.3	14340	98.8	13490	93.0	14100	97.2	11240	77.5	8600	59.2
		26.00	38.69	0.476	12.09	18150	125.1	15980	110.2	13490	93.0	14100	97.2	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8.94	8660	59.7	10100	69.5	10100	69.5	10100	69.5	10100	69.5	7390	50.9
		28.00	41.67	0.417	10.59	11710	80.7	11960	82.4	11960	82.4	11960	82.4	11960	82.4	7390	50.9
		32.00	47.62	0.475	12.06	14120	97.4	13620	93.8	13620	93.8	12170	83.9	12280	84.6	7390	50.9
7	177.80	23.00	34.23	0.317	8.05	6090	42.0	8600	59.3	8600	59.3	8600	59.3	8600	59.3	7170	49.4
		26.00	38.69	0.362	9.19	8190	56.5	9830	67.7	9830	67.7	9830	67.7	9830	67.7	7170	49.4
		29.00	43.16	0.408	10.36	10340	71.3	11070	76.3	11070	76.3	11070	76.3	11070	76.3	7170	49.4
		32.00	47.62	0.453	11.51	12230	84.3	12300	84.7	12300	84.7	12300	84.7	12300	84.7	7170	49.4
		35.00	52.09	0.498	12.65	13970	96.3	13520	93.1	12370	85.2	12970	89.4	13070	90.0	7170	49.4
		38.00	56.55	0.540	13.72	15540	107.1	14470	99.7	12370	85.2	12970	89.4	13070	90.0	7170	49.4

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-XP-P110

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	10240	70.6	13190	91.0	13190	91.0	13190	91.0	13190	91.0	12650	87.2
		13.50	20.09	0.290	7.37	13600	93.8	15310	105.6	15310	105.6	15130	104.3	15310	105.6	12650	87.2
		15.10	22.47	0.337	8.56	17010	117.3	17790	122.7	16620	114.6	17790	122.7	15460	106.6	12650	87.2
5	127.00	15.00	22.32	0.296	7.52	11660	80.4	14060	97.0	14060	97.0	14060	97.0	14060	97.0	11660	80.4
		18.00	26.79	0.362	9.19	16220	111.8	17200	118.5	17200	118.5	15200	104.8	15490	106.8	11660	80.4
		21.40	31.85	0.437	11.10	20790	143.3	20760	143.1	18440	127.2	18730	129.2	15490	106.8	11660	80.4
		23.20	34.53	0.478	12.14	23150	159.6	21350	147.2	18440	127.2	18730	129.2	15490	106.8	11660	80.4
		24.10	35.86	0.500	12.70	24410	168.3	21350	147.2	18440	127.2	18730	129.2	15490	106.8	11660	80.4
5 1/2	139.70	17.00	25.30	0.304	7.72	10130	69.8	13130	90.5	13130	90.5	13130	90.5	13130	90.5	10750	74.1
		20.00	29.76	0.361	9.17	13970	96.3	15590	107.5	15590	107.5	13920	96.0	14060	96.9	10750	74.1
		23.00	34.23	0.415	10.54	17170	118.4	17920	123.6	16880	116.4	17620	121.5	14060	96.9	10750	74.1
		26.00	38.69	0.476	12.09	20700	142.7	20000	137.9	16880	116.4	17620	121.5	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8.94	9400	64.8	12620	87.0	12620	87.0	12620	87.0	12620	87.0	9230	63.7
		28.00	41.67	0.417	10.59	13650	94.1	14950	103.1	14950	103.1	14950	103.1	14950	103.1	9230	63.7
		32.00	47.62	0.475	12.06	15960	110.0	17030	117.4	17030	117.4	15220	104.9	15340	105.8	9230	63.7
7	177.80	23.00	34.23	0.317	8.05	6250	43.1	10760	74.2	10760	74.2	10760	74.2	10760	74.2	8960	61.8
		26.00	38.69	0.362	9.19	9140	63.0	12280	84.7	12280	84.7	12280	84.7	12280	84.7	8960	61.8
		29.00	43.16	0.408	10.36	11290	77.8	13840	95.4	13840	95.4	13840	95.4	13840	95.4	8960	61.8
		32.00	47.62	0.453	11.51	13650	94.1	15370	106.0	15370	106.0	15370	106.0	15370	106.0	8960	61.8
		35.00	52.09	0.498	12.65	15800	108.9	16900	116.5	15460	106.6	16220	111.8	16330	112.6	8960	61.8
		38.00	56.55	0.540	13.72	17690	122.0	18080	124.7	15460	106.6	16220	111.8	16330	112.6	8960	61.8

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

VA-XP-T95-1																				
				COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE														
SC		LC		all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC		
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	
10560	72.7	10560	72.7	9080	62.6	10560	72.7	10560	72.7	10560	72.7	10560	72.7	10120	69.7	10560	72.7	10560	72.7	
12240	84.4	12240	84.4	11550	79.6	12240	84.4	12240	84.4	12100	83.4	12240	84.4	10120	69.7	12240	84.4	12240	84.4	
12850	88.5	13320	91.8	14120	97.4	14230	98.0	13290	91.6	14230	98.0	12370	85.2	10120	69.7	12850	88.5	13320	91.8	
11250	77.5	11250	77.5	10130	69.8	11250	77.5	11250	77.5	11250	77.5	11250	77.5	9330	64.3	11250	77.5	11250	77.5	
12820	88.3	13520	93.2	13490	93.0	13760	94.7	13760	94.7	12160	83.8	12390	85.4	9330	64.3	12820	88.3	13520	93.2	
12820	88.3	13520	93.2	17010	117.3	16610	114.4	14760	101.7	14990	103.3	12390	85.4	9330	64.3	12820	88.3	13520	93.2	
12820	88.3	13520	93.2	18900	130.3	17080	117.7	14760	101.7	14990	103.3	12390	85.4	9330	64.3	12820	88.3	13520	93.2	
12820	88.3	13520	93.2	19850	136.9	17080	117.7	14760	101.7	14990	103.3	12390	85.4	9330	64.3	12820	88.3	13520	93.2	
10500	72.3	10500	72.3	9030	62.3	10500	72.3	10500	72.3	10500	72.3	10500	72.3	8600	59.2	10500	72.3	10500	72.3	
11700	80.6	12350	85.1	11810	81.4	12470	85.9	12470	85.9	11140	76.7	11240	77.5	8600	59.2	11700	80.6	12350	85.1	
11700	80.6	12350	85.1	14230	98.1	14340	98.8	13490	93.0	14100	97.2	11240	77.5	8600	59.2	11700	80.6	12350	85.1	
-	-	-	-	16780	115.7	15980	110.2	13490	93.0	14100	97.2	-	-	-	-	-	-	-	-	
10100	69.5	10100	69.5	8350	57.6	10100	69.5	10100	69.5	10100	69.5	10100	69.5	7390	50.9	10100	69.5	10100	69.5	
11960	82.4	11960	82.4	11180	77.1	11960	82.4	11960	82.4	11960	82.4	11960	82.4	7390	50.9	11960	82.4	11960	82.4	
12700	87.5	13340	91.9	13340	92.0	13620	93.8	13620	93.8	12170	83.9	12280	84.6	7390	50.9	12700	87.5	13340	91.9	
8600	59.3	8600	59.3	5880	40.5	8600	59.3	8600	59.3	8600	59.3	8600	59.3	7170	49.4	8600	59.3	8600	59.3	
9830	67.7	9830	67.7	7930	54.7	9830	67.7	9830	67.7	9830	67.7	9830	67.7	7170	49.4	9830	67.7	9830	67.7	
11070	76.3	11070	76.3	9870	68.1	11070	76.3	11070	76.3	11070	76.3	11070	76.3	7170	49.4	11070	76.3	11070	76.3	
12300	84.7	12300	84.7	11600	80.0	12300	84.7	12300	84.7	12300	84.7	12300	84.7	7170	49.4	12300	84.7	12300	84.7	
13320	91.8	13520	93.1	13180	90.9	13520	93.1	12370	85.2	12970	89.4	13070	90.0	7170	49.4	13320	91.8	13520	93.1	
13320	91.8	14010	96.6	14650	101.0	14470	99.7	12370	85.2	12970	89.4	13070	90.0	7170	49.4	13320	91.8	14010	96.6	

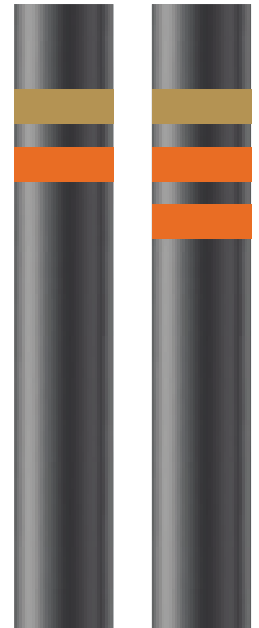
VA-XP-Q125-1																				
				COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE														
SC		LC		all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC		
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	
13190	91.0	13190	91.0	10760	74.2	14250	98.3	14250	98.3	14250	98.3	14250	98.3	13660	94.2	14250	98.3	14250	98.3	
15310	105.6	15310	105.6	14600	100.7	16530	114.1	16530	114.1	16340	112.7	16530	114.1	13660	94.2	16530	114.1	16530	114.1	
16060	110.8	16650	114.8	18590	128.2	19210	132.5	17950	123.8	19210	132.5	16700	115.2	13660	94.2	17350	119.6	17980	124.0	
14060	97.0	14060	97.0	12390	85.4	15180	104.7	15180	104.7	15180	104.7	15180	104.7	12590	86.8	15180	104.7	15180	104.7	
16030	110.5	16900	116.6	17640	121.6	18570	128.0	18570	128.0	16410	113.2	16730	115.4	12590	86.8	17310	119.4	18260	125.9	
16030	110.5	16900	116.6	22890	157.8	22420	154.6	19920	137.4	20230	139.5	16730	115.4	12590	86.8	17310	119.4	18260	125.9	
16030	110.5	16900	116.6	25570	176.3	23050	159.0	19920	137.4	20230	139.5	16730	115.4	12590	86.8	17310	119.4	18260	125.9	
16030	110.5	16900	116.6	26990	186.1	23050	159.0	19920	137.4	20230	139.5	16730	115.4	12590	86.8	17310	119.4	18260	125.9	
13130	90.5	13130	90.5	10660	73.5	14180	97.8	14180	97.8	14180	97.8	14180	97.8	11610	80.0	14180	97.8	14180	97.8	
14630	100.9	15440	106.5	15120	104.3	16840	116.1	16840	116.1	15040	103.7	15180	104.7	11610	80.0	15800	109.0	16670	115.0	
14630	100.9	15440	106.5	18800	129.6	19350	133.5	18230	125.7	19040	131.3	15180	104.7	11610	80.0	15800	109.0	16670	115.0	
-	-	-	-	23070	159.1	21600	148.9	18230	125.7	19040	131.3	-	-	-	-	-	-	-	-	
12620	87.0	12620	87.0	9920	68.4	13630	94.0	13630	94.0	13630	94.0	13630	94.0	9970	68.8	13630	94.0	13630	94.0	
14950	103.1	14950	103.1	13910	95.9	16140	111.3	16140	111.3	16140	111.3	16140	111.3	9970	68.8	16140	111.3	16140	111.3	
15880	109.5	16670	115.0	17380	119.8	18390	126.8	18390	126.8	16430	113.3	16570	114.3	9970	68.8	17150	118.3	18010	124.2	
10760	74.2	10760	74.2	6410	44.2	11620	80.1	11620	80.1	11620	80.1	11620	80.1	9680	66.7	11620	80.1	11620	80.1	
12280	84.7	12280	84.7	9190	63.4	13260	91.4	13260	91.4	13260	91.4	13260	91.4	9680	66.7	13260	91.4	13260	91.4	
13840	95.4	13840	95.4	11970	82.5	14950	103.1	14950	103.1	14950	103.1	14950	103.1	9680	66.7	14950	103.1	14950	103.1	
15370	106.0	15370	106.0	14700	101.4	16600	114.5	16600	114.5	16600	114.5	16600	114.5	9680	66.7	16600	114.5	16600	114.5	
16650	114.8	16900	116.5	17170	118.4	18250	125.9	16690	115.1	17510	120.8	17640	121.6	9680	66.7	17980	124.0	18250	125.9	
16650	114.8	17520	120.8	19430	134.0	19530	134.7	16690	115.1	17510	120.8	17640	121.6	9680	66.7	17980	124.0	18920	130.5	

# VA – SOUR SERVICE – SERIES

Seamless Casing and Tubing based on the requirements of API specification 5CT for use in sour service applications.

## Marking

According to API specification 5CT plus additional marking of “VA-S-...” or “VA-SS-...” (... stands e.g. for 80, 90 etc.). Upon request API monogram will be applied. See also “Production & Marking” on page 25.



S-Series

SS-Series



## Mechanical Properties

	GRADE		YIELD STRENGTH		TENSILE STRENGTH		HARDNESS			GRAIN SIZE	HARDENABILITY
							MEAN HARDNESS VALUE	SINGLE HARDNESS INDENTATION	ALLOWABLE HARDNESS VARIATION		MEAN AS QUENCHED HARDNESS
							HRC	HRC	HRC		HRC
	<b>L80-1</b> API SPEC 5CT	min.	80	552	95	655				n.L.	52x(%C)+21
		max.	95	655			23	23	n.L.		
Testing frequency	OD ≤ 4 1/2"				2/200		2/200			statistical evidence	
	OD > 4 1/2"				2/100		2/100				
	<b>VA-SS-80</b>	min.	80	552	95	655				ASTM 5 or finer	52x(%C)+21
		max.	95	655			22	23	3		
Testing frequency	OD ≤ 4 1/2"				2/200		2/200			1 / Heat treatment run	
	OD > 4 1/2"				2/100		2/100				
	<b>C90-1</b> API SPEC 5CT	min.	90	621	100	689				ASTM 5 or finer	58x(%C)+27
		max.	105	724			25.4	27	*		
Testing frequency	OD ≤ 4 1/2"				2/200		"each Pipe" NU, "every 20 lengths" EU			1 / Heat treatment run	
	OD > 4 1/2"				2/100						
	<b>VA-SS-90</b>	min.	90	621	100	689				ASTM 5 or finer	58x(%C)+27
		max.	105	724			24	27	3		
Testing frequency	OD ≤ 4 1/2"				2/200		1/20			1 / Heat treatment run	
	OD > 4 1/2"				2/100		1/20				
	<b>T95-1</b> API SPEC 5CT	min.	95	655	105	724				ASTM 5 or finer	58x(%C)+27
		max.	110	758			25.4	27	*		
Testing frequency	OD ≤ 4 1/2"				1/200		"each Pipe" NU, "every 20 lengths" EU			1 / Heat treatment run	
	OD > 4 1/2"				1/100						
	<b>VA-SS-95</b>	min.	95	655	105	724				ASTM 5 or finer	58x(%C)+27
		max.	110	758			25.4	27	3		
Testing frequency	OD ≤ 4 1/2"				2/200		1/20			1 / Heat treatment run	
	OD > 4 1/2"				2/100		1/20				
	<b>C110</b> API SPEC 5CT	min.	110	758	115	793				ASTM 6 or finer	59x(%C)+29
		max.	120	828			29	31	3		
Testing frequency	all sizes				1/100		"each Pipe" NU, "every 20 lengths" EU			1 / Heat treatment run	
	<b>VA-SS-110</b>	min.	110	758	115	793				ASTM 6 or finer	59x(%C)+29
		max.	120	828			29	31	3		
Testing frequency	all sizes				2/100		1/20			2 / Heat treatment run	
	<b>VA-S-110</b>	min.	110	758	115	793				ASTM 6 or finer	59x(%C)+29
		max.	120	828			29	31	3		
Testing frequency	all sizes				2/100		1/20			2 / Heat treatment run	
	<b>VA-S-125</b>	min.	125	862	130	897				ASTM 6 or finer	59x(%C)+29
		max.	135	931			34	36	3		
Testing frequency	all sizes				2/100		1/20			2 / Heat treatment run	

n.L. not listed

OD Outside Diameter

NU Non Upset End

EU External Upset End

%C percent carbon of the heat analysis

\* Maximum Hardness Variation (HrC) for wall thickness

≤ 12.70 mm ≤ 0.50 inch 3

12.71 - 19.04 mm 0.51 - 0.74 inch 4

19.05 - 25.39 mm 0.75 - 0.99 inch 5

≥ 25.40 mm ≥ 1 inch 6

## CHEMICAL COMPOSITION

GRADE	L80-1	VA-SS-80	C90-1	VA-SS-90	T95-1	VA-SS-95	C110	VA-SS-110	VA-S-110	VA-S-125
C	max. 0.43	max. 0.35	max. 0.35	max. 0.35	max. 0.35	max. 0.35	max. 0.35	max. 0.35	max. 0.35	max. 0.35
Mn	max. 1.90	max. 1.50	max. 1.20	max. 1.20	max. 1.20	max. 1.20	max.1.20	max.1.20	max.1.20	max.1.20
Mo	n.L.	0.15 - 0.50	0.25 - 0.85	0.25 - 0.85	0.25 - 0.85	0.25 - 0.85	0.25 - 1.00	0.25 - 1.00	0.25 - 1.00	0.25 - 1.00
Cr	n.L.	max. 1.20	max. 1.50	max. 1.50	0.40 - 1.50	0.40 - 1.50	0.40 - 1.50	0.40 - 1.50	0.40 - 1.50	0.40 - 1.50
Ni	max. 0.25	max. 0.20	max. 0.99	max. 0.20	max. 0.99	max. 0.20	max. 0.99	max. 0.99	max. 0.99	max. 0.99
Cu	max. 0.35	max. 0.25	n.L.	max. 0.25	n.L.	max. 0.25	n.L.	n.L.	n.L.	n.L.
P	max. 0.030	max. 0.020	max. 0.020	max. 0.020	max. 0.020	max. 0.020	max. 0.020	max. 0.020	max. 0.020	max. 0.020
S	max. 0.030	max. 0.015	max. 0.010	max. 0.010	max. 0.010	max. 0.010	max. 0.005	max.0.005	max.0.005	max. 0.005
Si	max. 0.45	max. 0.45	n.L.	max. 0.45	n.L.	max. 0.45	n.L.	n.L.	n.L.	n.L.

## SULFIDE STRESS CRACKING TESTS (SSC)

L80-1	According to API specification 5CT no SSC-Test is required
VA-SS-80	Based on API specification 5CT and NACE TM0177 <b>Method A*   90%   720 hours</b> If required by customer: 1 test / lot If not required, SSC-Test performance will be guaranteed
C90-1	According to API specification 5CT and NACE TM0177 <b>Method A*   80%   720 hours   (1 test / lot)</b>
VA-SS-90	Based on API specification 5CT and NACE TM0177 <b>Method A*   90%   720 hours</b> If required by customer: 1 test / lot If not required, SSC-Test performance will be guaranteed
T95-1	According to API specification 5CT and NACE TM0177 <b>Method A*   80%   720 hours   (1 test / lot)</b>
VA-SS-95	Based on API specification 5CT and NACE TM0177 <b>Method A*   90%   720 hours</b> If required by customer: 1 test / lot If not required, SSC-Test performance will be guaranteed
C110	Acc. to API spec. 5CT and NACE TM0177 <b>Method A*   85%   720 hours   (3 tests / lot)</b>
VA-SS-110	Based on API spec. 5CT and NACE TM0177 <b>Method A*   85%   720 hours   (1 test / lot)</b>
VA-S-110	Based on API spec. 5CT and NACE TM0177 <b>Method A**   85%   720 hours   (1 test / lot)</b> Also available as VA-S-P110 with API Monogram, following the api requirements for P110 + additional SSC test.
VA-S-125	Based on API specification 5CT and NACE TM0177 <b>Method A***   85%   720 hours   (1 test / lot)</b>

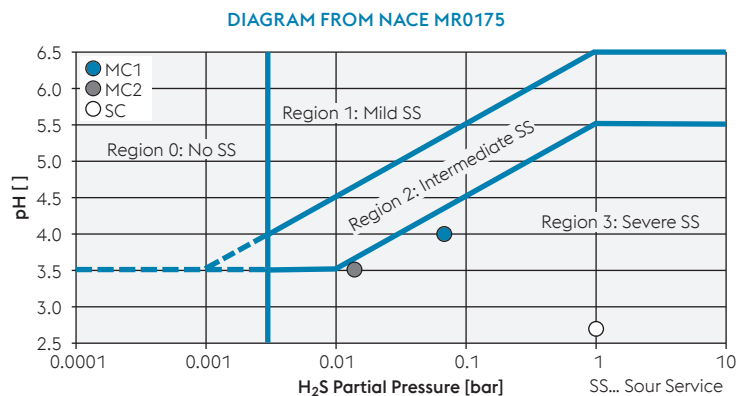
\* Standard Condition (SC): Tested in NACE test solution A with a pH<sub>START</sub> of 2.7, purged with a 100% H<sub>2</sub>S gas.

\*\* Mild Condition (MC1): Tested in NACE test solution D (API alternative test solution) with a pH<sub>START</sub> of 4.0, purged with a 7% H<sub>2</sub>S + 93% N<sub>2</sub> test gas mixture.

\*\*\* Mild Condition (MC2): Tested in NACE test solution B with a pH<sub>START</sub> of 3.5, purged with a 3%H<sub>2</sub>S + 97%N<sub>2</sub> test gas mixture.

n.L. not listed

## DEFINITION OF MILD/STANDARD CONDITION



## STATISTICAL EVIDENCE

Pipe samples with various dimensions chosen from multiple heats successfully passed NACE TM0177 tests for sulfide stress cracking. We guarantee that the same steel type as well as manufacturing parameters and inspection methods are used for all orders of the same sour service series.

**Method D grades and tests available on request.**



## NON DESTRUCTIVE TESTING OF PIPE BODY

GRADE	ACCEPTANCE (INSPECTION) LEVELS				FLUX LEAKAGE INSPECTION (Pipe Body)	ULTRASONIC INSPECTION (Pipe Body)	MAGNETIC PARTICLE INSPECTION (Pipe Ends)
	INTERNAL		EXTERNAL				
	LONGITUDINAL	TRANSVERSAL	LONGITUDINAL	TRANSVERSAL			
L80-1	L4 (12.5% nWt)		L4 (12.5% nWt)		A	A	R
VA-SS-80	L3 (10% nWt)	L3 (10% nWt)	L2 (5% nWt)	L2 (5% nWt)	B		R
	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)		C	
C90-1			L2 (5% nWt)	L2 (5% nWt)	B		R
	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)		C	
VA-SS-90	L3 (10% nWt)	L3 (10% nWt)	L2 (5% nWt)	L2 (5% nWt)	B		R
	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)		C	
T95-1			L2 (5% nWt)	L2 (5% nWt)	B		R
	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)		C	
VA-SS-95	L3 (10% nWt)	L3 (10% nWt)	L2 (5% nWt)	L2 (5% nWt)	B		R
	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)		C	
C110			L2 (5% nWt)	L2 (5% nWt)	B		R
	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)		C	
VA-SS-110	L3 (10% nWt)	L3 (10% nWt)	L2 (5% nWt)	L2 (5% nWt)	B		R
	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)		C	
VA-S-110	L3 (10% nWt)	L3 (10% nWt)	L2 (5% nWt)	L2 (5% nWt)	B		R
	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)		C	
VA-S-125	L3 (10% nWt)	L3 (10% nWt)	L2 (5% nWt)	L2 (5% nWt)	B		R
	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)	L2 (5% nWt)		C	

- A one method or a combination of methods at manufacturer's option  
 B shall be used in addition to ultrasonic inspection for outside surface  
 C shall be used for outside and inside inspection  
 R required  
 nWT nominal Wall Thickness  
 L acceptance level

All VA-S- and VA-SS-graded pipes are subject to a 100 % coverage ultrasonic testing inspection for wall thickness (min. 93.75 % average wall).

## PRODUCTION AND MARKING

GRADE	QUENCHED & TEMPERED	HOT ROTARY STRAIGHTENING	TRACEABILITY		API MONOGRAM	TEMPERING		STRAIGHTENING	
			SINGLE PIPE	LOT		TEMPERATURE		MIN.°C	MIN.°F
						MIN.°C	MIN.°F		
L80-1	YES	NO	NO	NO	YES	566	1050	n.L.	n.L.
VA-SS-80	YES	YES	NO	YES	YES*	566	1050	480	900
C90-1	YES	YES	YES	NO	YES	621	1150	480	900
VA-SS-90	YES	YES	NO	YES	NO	621	1150	480	900
T95-1	YES	YES	YES	NO	YES	649	1200	480	900
VA-SS-95	YES	YES	NO	YES	NO	649	1200	480	900
C110	YES	YES	YES	NO	YES	649	1200	600	1125
VA-SS-110	YES	YES	NO	YES	NO	649	1200	600	1125
VA-S-110	YES	YES	NO	YES	NO	649	1200	600	1125
VA-S-125	YES	YES	NO	YES	NO	640	1184	600	1125

Performance properties as listed in API TR 5C3 under the corresponding API grade (see appendix).

\*Upon request API monogram will be applied. Marking according to API specification 5CT plus additional marking of "VA-SS-80".

# SOUR SERVICE GRADES IN COMBINATION WITH HIGH COLLAPSE

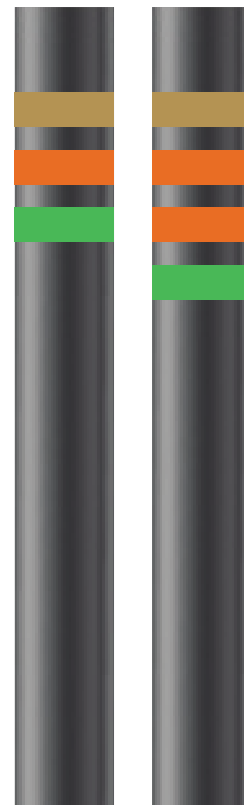
This combination fulfills the requirements of API specification 5CT for use in sour service applications, complying with API Specification 5CT for use in high external pressure environments for collapse values exceeding those published by API in TR 5C3 and burst values according to the API TR 5C3. For further details please check the individual sections of Sour Service Grades or High Collapse Grades.

## Marking

According to API specification 5CT plus additional marking of "VA-S-...HC" or "VA-SS-...-HC" (... stands e.g. for 80, 90 etc.). API monogram can be applied upon request for VA-SS-80-HC.

## Testing

Collapse performance numbers guaranteed on a statistical database. Collapse testing is done at the decision of VAT or if required by customer with a frequency of 1 sample (min. length is 8 times the outside diameter) per heat treatment lot.



S-Series

SS-Series

### DIMENSION (STANDARD DRIFT SIZE)

### VA-SS-80-HC

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE											
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance			
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa		
4 1/2	114.30	11.60	17.26	0.250	6.35	7800	53.8	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	53.7	7780	
		13.50	20.09	0.290	7.37	9650	66.5	9020	62.3	9020	62.3	9020	62.3	9020	62.3	9020	62.3	8100	55.9
		15.10	22.47	0.337	8.56	11650	80.3	10480	72.3	10480	72.3	10480	72.3	10480	72.3	9900	68.3	8100	55.9
5	127.00	15.00	22.32	0.296	7.52	8600	59.3	8290	57.2	8290	57.2	8290	57.2	8290	57.2	8290	57.2	7460	51.5
		18.00	26.79	0.362	9.19	11200	77.2	10140	69.9	10140	69.9	9730	67.1	9910	68.4	7460	51.5		
		21.40	31.85	0.437	11.10	13400	92.4	12240	84.4	11800	81.5	11990	82.7	9910	68.4	7460	51.5		
		23.20	34.53	0.478	12.14	15500	106.9	13380	92.3	11800	81.5	11990	82.7	9910	68.4	7460	51.5		
		24.10	35.86	0.500	12.70	16300	112.4	14000	96.6	11800	81.5	11990	82.7	9910	68.4	7460	51.5		
5 1/2	139.70	17.00	25.30	0.304	7.72	7700	53.1	7740	53.4	7740	53.4	7740	53.4	7740	53.4	6880	47.5		
		20.00	29.76	0.361	9.17	9900	68.3	9190	63.4	9190	63.4	8910	61.5	9000	62.1	6880	47.5		
		23.00	34.23	0.415	10.54	11750	81.0	10560	72.9	10560	72.9	10560	72.9	9000	62.1	6880	47.5		
		26.00	38.69	0.476	12.09	13670	94.3	12130	83.6	10810	74.5	11280	77.8	-	-	-	-		
6 5/8	168.28	24.00	35.72	0.352	8.94	7250	50.0	7440	51.3	7440	51.3	7440	51.3	7440	51.3	5910	40.8		
		28.00	41.67	0.417	10.59	9350	64.5	8810	60.8	8810	60.8	8810	60.8	8810	60.8	5910	40.8		
		32.00	47.62	0.475	12.06	11050	76.2	10040	69.2	10040	69.2	9740	67.2	9820	67.8	5910	40.8		
7	177.80	23.00	34.23	0.317	8.05	5300	36.5	6340	43.7	6340	43.7	6340	43.7	6340	43.7	5730	39.6		
		26.00	38.69	0.362	9.19	6900	47.6	7240	49.9	7240	49.9	7240	49.9	7240	49.9	5730	39.6		
		29.00	43.16	0.408	10.36	8350	57.6	8160	56.3	8160	56.3	8160	56.3	8160	56.3	5730	39.6		
		32.00	47.62	0.453	11.51	9700	66.9	9060	62.5	9060	62.5	9060	62.5	9060	62.5	5730	39.6		
		35.00	52.09	0.498	12.65	10950	75.5	9960	68.7	9890	68.3	9960	68.7	9960	68.7	5730	39.6		
		38.00	56.55	0.540	13.72	12100	83.4	10800	74.5	9890	68.3	10380	71.6	10450	72.1	5730	39.6		

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread



VA-SS-90-HC																			
				COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE													
SC		LC		all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC	
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
7780	53.7	7780	53.7	8350	57.6	8750	60.4	8750	60.4	8750	60.4	8750	60.4	8750	60.4	8750	60.4	8750	60.4
9020	62.3	9020	62.3	10500	72.4	10150	70.1	10150	70.1	10150	70.1	10150	70.1	9110	62.9	10150	70.1	10150	70.1
10280	70.9	10480	72.3	12800	88.3	11800	81.4	11800	81.4	11800	81.4	11130	76.8	9110	62.9	11560	79.8	11800	81.4
8290	57.2	8290	57.2	9300	64.1	9320	64.3	9320	64.3	9320	64.3	9320	64.3	8390	57.9	9320	64.3	9320	64.3
10140	69.9	10140	69.9	12250	84.5	11400	78.6	11400	78.6	10940	75.5	11150	77.0	8390	57.9	11400	78.6	11400	78.6
10260	70.8	10820	74.6	15400	106.2	13770	95.0	13280	91.6	13490	93.1	11150	77.0	8390	57.9	11540	79.6	12170	84.0
10260	70.8	10820	74.6	17100	117.9	15060	103.9	13280	91.6	13490	93.1	11150	77.0	8390	57.9	11540	79.6	12170	84.0
10260	70.8	10820	74.6	18000	124.1	15750	108.7	13280	91.6	13490	93.1	11150	77.0	8390	57.9	11540	79.6	12170	84.0
7740	53.4	7740	53.4	8300	57.2	8710	60.1	8710	60.1	8710	60.1	8710	60.1	7740	53.4	8710	60.1	8710	60.1
9190	63.4	9190	63.4	10800	74.5	10340	71.3	10340	71.3	10020	69.2	10120	69.8	7740	53.4	10340	71.3	10340	71.3
9360	64.6	9880	68.2	12900	88.9	11880	82.0	11880	82.0	11880	82.0	10120	69.8	7740	53.4	10530	72.7	11110	76.7
-	-	-	-	15120	104.2	13650	94.1	12150	83.8	12710	87.6	-	-	-	-	-	-	-	-
7440	51.3	7440	51.3	7700	53.1	8370	57.7	8370	57.7	8370	57.7	8370	57.7	6650	45.9	8370	57.7	8370	57.7
8810	60.8	8810	60.8	10150	70.0	9910	68.4	9910	68.4	9910	68.4	9910	68.4	6650	45.9	9910	68.4	9910	68.4
10040	69.2	10040	69.2	12200	84.1	11290	77.9	11290	77.9	10960	75.6	11050	76.2	6650	45.9	11290	77.9	11290	77.9
6340	43.7	6340	43.7	5500	37.9	7130	49.2	7130	49.2	7130	49.2	7130	49.2	6450	44.5	7130	49.2	7130	49.2
7240	49.9	7240	49.9	7350	50.7	8150	56.2	8150	56.2	8150	56.2	8150	56.2	6450	44.5	8150	56.2	8150	56.2
8160	56.3	8160	56.3	9050	62.4	9180	63.3	9180	63.3	9180	63.3	9180	63.3	6450	44.5	9180	63.3	9180	63.3
9060	62.5	9060	62.5	10600	73.1	10190	70.4	10190	70.4	10190	70.4	10190	70.4	6450	44.5	10190	70.4	10190	70.4
9960	68.7	9960	68.7	12000	82.7	11210	77.3	11130	76.8	11210	77.3	11210	77.3	6450	44.5	11210	77.3	11210	77.3
10660	73.5	10800	74.5	13300	91.7	12150	83.9	11130	76.8	11680	80.6	11760	81.1	6450	44.5	11990	82.7	12150	83.9

DIMENSION (STANDARD DRIFT SIZE)

VA-SS-95-HC

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	8650	59.6	9240	63.7	9240	63.7	9240	63.7	9240	63.7	9240	63.7
		13.50	20.09	0.290	7.37	11000	75.8	10710	73.9	10710	73.9	10710	73.9	10710	73.9	9620	66.3
		15.10	22.47	0.337	8.56	13450	92.7	12450	85.8	12450	85.8	12450	85.8	11750	81.0	9620	66.3
5	127.00	15.00	22.32	0.296	7.52	9650	66.5	9840	67.9	9840	67.9	9840	67.9	9840	67.9	8860	61.1
		18.00	26.79	0.362	9.19	12850	88.6	12040	82.9	12040	82.9	11550	79.6	11770	81.2	8860	61.1
		21.40	31.85	0.437	11.10	16200	111.7	14530	100.2	14020	96.7	14240	98.2	11770	81.2	8860	61.1
		23.20	34.53	0.478	12.14	18000	124.1	15890	109.6	14020	96.7	14240	98.2	11770	81.2	8860	61.1
		24.10	35.86	0.500	12.70	18900	130.3	16630	114.6	14020	96.7	14240	98.2	11770	81.2	8860	61.1
5 1/2	139.70	17.00	25.30	0.304	7.72	8600	59.3	9190	63.3	9190	63.3	9190	63.3	9190	63.3	8170	56.3
		20.00	29.76	0.361	9.17	11250	77.6	10910	75.2	10910	75.2	10580	73.0	10680	73.7	8170	56.3
		23.00	34.23	0.415	10.54	13550	93.4	12540	86.5	12540	86.5	12540	86.5	10680	73.7	8170	56.3
		26.00	38.69	0.476	12.09	15980	110.2	14390	99.2	12820	88.4	13400	92.4	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8.94	7950	54.8	8830	60.9	8830	60.9	8830	60.9	8830	60.9	7020	48.4
		28.00	41.67	0.417	10.59	10650	73.4	10460	72.1	10460	72.1	10460	72.1	10460	72.1	7020	48.4
		32.00	47.62	0.475	12.06	12700	87.6	11920	82.1	11920	82.1	11560	79.7	11660	80.4	7020	48.4
7	177.80	23.00	34.23	0.317	8.05	5600	38.6	7530	51.9	7530	51.9	7530	51.9	7530	51.9	6810	46.9
		26.00	38.69	0.362	9.19	7550	52.1	8600	59.2	8600	59.2	8600	59.2	8600	59.2	6810	46.9
		29.00	43.16	0.408	10.36	9400	64.8	9690	66.8	9690	66.8	9690	66.8	9690	66.8	6810	46.9
		32.00	47.62	0.453	11.51	11050	76.2	10760	74.2	10760	74.2	10760	74.2	10760	74.2	6810	46.9
		35.00	52.09	0.498	12.65	12550	86.5	11830	81.6	11750	81.0	11830	81.6	11830	81.6	6810	46.9
		38.00	56.55	0.540	13.72	13950	96.2	12830	88.5	11750	81.0	12320	85.0	12410	85.6	6810	46.9

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-S-125-HC

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	10050	69.3	12150	83.8	12150	83.8	12150	83.8	12150	83.8	12150	83.8
		13.50	20.09	0.290	7.37	13500	93.1	14100	97.3	14100	97.3	14100	97.3	14100	97.3	12650	87.2
		15.10	22.47	0.337	8.56	17100	117.9	16380	113.0	16380	113.0	16380	113.0	15460	106.6	12650	87.2
5	127.00	15.00	22.32	0.296	7.52	11600	80.0	12950	89.3	12950	89.3	12950	89.3	12950	89.3	11660	80.4
		18.00	26.79	0.362	9.19	16400	113.1	15840	109.2	15840	109.2	15200	104.8	15490	106.8	11660	80.4
		21.40	31.85	0.437	11.10	21200	146.2	19120	131.8	18440	127.2	18730	129.2	15490	106.8	11660	80.4
		23.20	34.53	0.478	12.14	23600	162.7	20910	144.2	18440	127.2	18730	129.2	15490	106.8	11660	80.4
		24.10	35.86	0.500	12.70	24700	170.3	21880	150.9	18440	127.2	18730	129.2	15490	106.8	11660	80.4
5 1/2	139.70	17.00	25.30	0.304	7.72	9950	68.6	12090	83.4	12090	83.4	12090	83.4	12090	83.4	10750	74.1
		20.00	29.76	0.361	9.17	14000	96.5	14360	99.0	14360	99.0	13920	96.0	14060	96.9	10750	74.1
		23.00	34.23	0.415	10.54	17300	119.3	16510	113.8	16510	113.8	16510	113.8	14060	96.9	10750	74.1
		26.00	38.69	0.476	12.09	21220	146.3	18930	130.5	16880	116.4	17620	121.5	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8.94	9250	63.8	11620	80.1	11620	80.1	11620	80.1	11620	80.1	9230	63.7
		28.00	41.67	0.417	10.59	12850	88.6	13770	94.9	13770	94.9	13770	94.9	13770	94.9	9230	63.7
		32.00	47.62	0.475	12.06	15950	110.0	15680	108.1	15680	108.1	15220	104.9	15340	105.8	9230	63.7
7	177.80	23.00	34.23	0.317	8.05	6000	41.4	9910	68.3	9910	68.3	9910	68.3	9910	68.3	8960	61.8
		26.00	38.69	0.362	9.19	8550	59.0	11310	78.0	11310	78.0	11310	78.0	11310	78.0	8960	61.8
		29.00	43.16	0.408	10.36	10800	74.5	12750	87.9	12750	87.9	12750	87.9	12750	87.9	8960	61.8
		32.00	47.62	0.453	11.51	13200	91.0	14160	97.7	14160	97.7	14160	97.7	14160	97.7	8960	61.8
		35.00	52.09	0.498	12.65	15350	105.8	15560	107.3	15460	106.6	15560	107.3	15560	107.3	8960	61.8
		38.00	56.55	0.540	13.72	17300	119.3	16880	116.4	15460	106.6	16220	111.8	16330	112.6	8960	61.8

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

VA-SS-110-HC/VA-S-110-HC

SC		LC		COLLAPSE RESISTANCE all thread types		INTERNAL YIELD PRESSURE RESISTANCE															
						VA superior		VAGT		VA roughneck		BC regular		BC special clearance		SC		LC			
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
9240	63.7	9240	63.7	9500	65.5	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7	10690	73.7
10710	73.9	10710	73.9	12450	85.8	12410	85.5	12410	85.5	12410	85.5	12410	85.5	12410	85.5	11130	76.7	12410	85.5	12410	85.5
12210	84.2	12450	85.8	15500	106.9	14420	99.3	14420	99.3	14420	99.3	13610	93.8	11130	76.7	14130	97.4	14420	99.3		
9840	67.9	9840	67.9	10750	74.1	11400	78.5	11400	78.5	11400	78.5	11400	78.5	10260	70.7	11400	78.5	11400	78.5		
12040	82.9	12040	82.9	14750	101.7	13940	96.0	13940	96.0	13370	92.2	13630	93.9	10260	70.7	13940	96.0	13940	96.0		
12180	84.0	12850	88.6	18850	130.0	16820	115.9	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5		
12180	84.0	12850	88.6	20950	144.5	18400	126.8	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5		
12180	84.0	12850	88.6	22100	152.4	19250	132.7	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5		
9190	63.3	9190	63.3	9400	64.8	10640	73.3	10640	73.3	10640	73.3	10640	73.3	9460	65.2	10640	73.3	10640	73.3		
10910	75.2	10910	75.2	12850	88.6	12640	87.1	12640	87.1	12250	84.4	12370	85.2	9460	65.2	12640	87.1	12640	87.1		
11120	76.7	11730	80.9	15650	107.9	14530	100.1	14530	100.1	14530	100.1	12370	85.2	9460	65.2	12870	88.7	13580	93.6		
-	-	-	-	18820	129.8	16650	114.8	14840	102.3	15500	106.9	-	-	-	-	-	-	-	-	-	-
8830	60.9	8830	60.9	8650	59.6	10230	70.5	10230	70.5	10230	70.5	10230	70.5	8120	56.0	10230	70.5	10230	70.5		
10460	72.1	10460	72.1	11950	82.4	12120	83.5	12120	83.5	12120	83.5	12120	83.5	8120	56.0	12120	83.5	12120	83.5		
11920	82.1	11920	82.1	14550	100.3	13800	95.1	13800	95.1	13390	92.3	13500	93.0	8120	56.0	13800	95.1	13800	95.1		
7530	51.9	7530	51.9	5900	40.7	8720	60.1	8720	60.1	8720	60.1	8720	60.1	7880	54.3	8720	60.1	8720	60.1		
8600	59.2	8600	59.2	8450	58.3	9960	68.6	9960	68.6	9960	68.6	9960	68.6	7880	54.3	9960	68.6	9960	68.6		
9690	66.8	9690	66.8	10450	72.1	11220	77.3	11220	77.3	11220	77.3	11220	77.3	7880	54.3	11220	77.3	11220	77.3		
10760	74.2	10760	74.2	12500	86.2	12460	85.9	12460	85.9	12460	85.9	12460	85.9	7880	54.3	12460	85.9	12460	85.9		
11830	81.6	11830	81.6	14400	99.3	13700	94.4	13600	93.7	13700	94.4	13700	94.4	7880	54.3	13700	94.4	13700	94.4		
12650	87.2	12830	88.5	16100	111.0	14850	102.4	13600	93.7	14270	98.3	14370	99.0	7880	54.3	14650	101.0	14850	102.4		

SC		LC	
psi	MPa	psi	MPa
12150	83.8	12150	83.8
14100	97.3	14100	97.3
16060	110.8	16380	113.0
12950	89.3	12950	89.3
15840	109.2	15840	109.2
16030	110.5	16900	116.6
16030	110.5	16900	116.6
16030	110.5	16900	116.6
12090	83.4	12090	83.4
14360	99.0	14360	99.0
14630	100.9	15440	106.5
-	-	-	-
11620	80.1	11620	80.1
13770	94.9	13770	94.9
15680	108.1	15680	108.1
9910	68.3	9910	68.3
11310	78.0	11310	78.0
12750	87.9	12750	87.9
14160	97.7	14160	97.7
15560	107.3	15560	107.3
16650	114.8	16880	116.4

# SOUR SERVICE GRADES IN COMBINATION WITH ENHANCED PROPERTIES

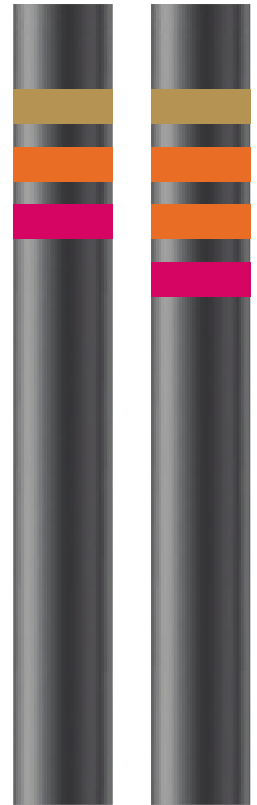
This combination fulfills the requirements of API specification 5CT for use in sour service applications, complying with API specification 5CT with enhanced properties for collapse and burst values exceeding those published by API in TR 5C3. For further details please check the individual sections of Sour Service Grades or Enhanced Properties.

## Marking

According to API specification 5CT plus additional marking of "VA-S-...EP" or "VA-SS-...-EP" (... stands e.g. for 80, 90 etc.). API monogram can be applied upon request for VA-SS-80-EP.

## Testing

Collapse performance numbers guaranteed on a statistical database. Collapse testing is done at the decision of VAT or if required by customer with a frequency of 1 sample (min. length is 8 times the outside diameter) per heat treatment lot.



S-Series

SS-Series



DIMENSION (STANDARD DRIFT SIZE)

VA-SS-80-EP

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE													
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 ½	114.30	11.60	17.26	0.250	6.35	7800	53.8	8440	58.3	8440	58.3	8440	58.3	8440	58.3	8100	55.9	8440	58.3	8440	58.3
		13.50	20.09	0.290	7.37	9650	66.5	9800	67.6	9800	67.6	9680	66.8	9800	67.6	8100	55.9	9800	67.6	9800	67.6
		15.10	22.47	0.337	8.56	11650	80.3	11380	78.5	10630	73.4	11380	78.5	9900	68.3	8100	55.9	10280	70.9	10650	73.5
5	127.00	15.00	22.32	0.296	7.52	8600	59.3	9000	62.1	9000	62.1	9000	62.1	9000	62.1	7460	51.5	9000	62.1	9000	62.1
		18.00	26.79	0.362	9.19	11200	77.2	11000	75.9	11000	75.9	9730	67.1	9910	68.4	7460	51.5	10260	70.8	10820	74.6
		21.40	31.85	0.437	11.10	13400	92.4	13280	91.7	11800	81.5	11990	82.7	9910	68.4	7460	51.5	10260	70.8	10820	74.6
		23.20	34.53	0.478	12.14	15500	106.9	13660	94.3	11800	81.5	11990	82.7	9910	68.4	7460	51.5	10260	70.8	10820	74.6
		24.10	35.86	0.500	12.70	16300	112.4	14000	96.6	11800	81.5	11990	82.7	9910	68.4	7460	51.5	10260	70.8	10820	74.6
5 ½	139.70	17.00	25.30	0.304	7.72	7700	53.1	8400	58.0	8400	58.0	8400	58.0	8400	58.0	6880	47.5	8400	58.0	8400	58.0
		20.00	29.76	0.361	9.17	9900	68.3	9980	68.8	9980	68.8	8910	61.5	9000	62.1	6880	47.5	9360	64.6	9880	68.2
		23.00	34.23	0.415	10.54	11750	81.0	11470	79.1	10800	74.5	11280	77.8	9000	62.1	6880	47.5	9360	64.6	9880	68.2
		26.00	38.69	0.476	12.09	13670	94.3	12810	88.3	10800	74.5	11280	77.8	-	-	-	-	-	-	-	-
6 ½	168.28	24.00	35.72	0.352	8.94	7250	50.0	8080	55.7	8080	55.7	8080	55.7	8080	55.7	5910	40.8	8080	55.7	8080	55.7
		28.00	41.67	0.417	10.59	9350	64.5	9570	66.0	9570	66.0	9570	66.0	9570	66.0	5910	40.8	9570	66.0	9570	66.0
		32.00	47.62	0.475	12.06	11050	76.2	10900	75.2	10900	75.2	9740	67.2	9820	67.8	5910	40.8	10160	70.1	10670	73.6
7	177.80	23.00	34.23	0.317	8.05	5300	36.5	6880	47.5	6880	47.5	6880	47.5	6880	47.5	5730	39.6	6880	47.5	6880	47.5
		26.00	38.69	0.362	9.19	6900	47.6	7860	54.2	7860	54.2	7860	54.2	7860	54.2	5730	39.6	7860	54.2	7860	54.2
		29.00	43.16	0.408	10.36	8350	57.6	8860	61.1	8860	61.1	8860	61.1	8860	61.1	5730	39.6	8860	61.1	8860	61.1
		32.00	47.62	0.453	11.51	9700	66.9	9840	67.9	9840	67.9	9840	67.9	9840	67.9	5730	39.6	9840	67.9	9840	67.9
		35.00	52.09	0.498	12.65	10950	75.5	10810	74.6	9890	68.3	10380	71.6	10450	72.1	5730	39.6	10660	73.5	10810	74.6
		38.00	56.55	0.540	13.72	12100	83.4	11570	79.9	9890	68.3	10380	71.6	10450	72.1	5730	39.6	10660	73.5	11210	77.4

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-SS-90-EP

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE													
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 ½	114.30	11.60	17.26	0.250	6.35	8350	57.6	9500	65.6	9500	65.6	9500	65.6	9500	65.6	9110	62.9	9500	65.6	9500	65.6
		13.50	20.09	0.290	7.37	10500	72.4	11020	76.1	11020	76.1	10890	75.2	11020	76.1	9110	62.9	11020	76.1	11020	76.1
		15.10	22.47	0.337	8.56	12800	88.3	12810	88.4	11960	82.6	12810	88.4	11130	76.8	9110	62.9	11560	79.8	11990	82.7
5	127.00	15.00	22.32	0.296	7.52	9300	64.1	10120	69.9	10120	69.9	10120	69.9	10120	69.9	8390	57.9	10120	69.9	10120	69.9
		18.00	26.79	0.362	9.19	12250	84.5	12380	85.4	12380	85.4	10940	75.5	11150	77.0	8390	57.9	11540	79.6	12170	84.0
		21.40	31.85	0.437	11.10	15400	106.2	14950	103.1	13280	91.6	13490	93.1	11150	77.0	8390	57.9	11540	79.6	12170	84.0
		23.20	34.53	0.478	12.14	17100	117.9	15370	106.0	13280	91.6	13490	93.1	11150	77.0	8390	57.9	11540	79.6	12170	84.0
		24.10	35.86	0.500	12.70	18000	124.1	15750	108.7	13280	91.6	13490	93.1	11150	77.0	8390	57.9	11540	79.6	12170	84.0
5 ½	139.70	17.00	25.30	0.304	7.72	8300	57.2	9450	65.2	9450	65.2	9450	65.2	9450	65.2	7740	53.4	9450	65.2	9450	65.2
		20.00	29.76	0.361	9.17	10800	74.5	11220	77.4	11220	77.4	10020	69.2	10120	69.8	7740	53.4	10530	72.7	11110	76.7
		23.00	34.23	0.415	10.54	12900	88.9	12900	89.0	12150	83.8	12690	87.6	10120	69.8	7740	53.4	10530	72.7	11110	76.7
		26.00	38.69	0.476	12.09	15120	104.2	14400	99.3	12150	83.8	12690	87.6	-	-	-	-	-	-	-	-
6 ½	168.28	24.00	35.72	0.352	8.94	7700	53.1	9090	62.7	9090	62.7	9090	62.7	9090	62.7	6650	45.9	9090	62.7	9090	62.7
		28.00	41.67	0.417	10.59	10150	70.0	10760	74.3	10760	74.3	10760	74.3	10760	74.3	6650	45.9	10760	74.3	10760	74.3
		32.00	47.62	0.475	12.06	12200	84.1	12260	84.6	12260	84.6	10960	75.6	11050	76.2	6650	45.9	11430	78.9	12000	82.8
7	177.80	23.00	34.23	0.317	8.05	5500	37.9	7740	53.4	7740	53.4	7740	53.4	7740	53.4	6450	44.5	7740	53.4	7740	53.4
		26.00	38.69	0.362	9.19	7350	50.7	8840	61.0	8840	61.0	8840	61.0	8840	61.0	6450	44.5	8840	61.0	8840	61.0
		29.00	43.16	0.408	10.36	9050	62.4	9970	68.8	9970	68.8	9970	68.8	9970	68.8	6450	44.5	9970	68.8	9970	68.8
		32.00	47.62	0.453	11.51	10600	73.1	11070	76.4	11070	76.4	11070	76.4	11070	76.4	6450	44.5	11070	76.4	11070	76.4
		35.00	52.09	0.498	12.65	12000	82.7	12170	83.9	11130	76.8	11680	80.6	11760	81.1	6450	44.5	11990	82.7	12170	83.9
		38.00	56.55	0.540	13.72	13300	91.7	13020	89.8	11130	76.8	11680	80.6	11760	81.1	6450	44.5	11990	82.7	12610	87.0

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-SS-95-EP

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	8650	59.6	10030	69.1	10030	69.1	10030	69.1	10030	69.1	9620	66.3
		13.50	20.09	0.290	7.37	11000	75.8	11630	80.2	11630	80.2	11500	79.3	11630	80.2	9620	66.3
		15.10	22.47	0.337	8.56	13450	92.7	13520	93.2	12630	87.1	13520	93.2	11750	81.0	9620	66.3
5	127.00	15.00	22.32	0.296	7.52	9650	66.5	10690	73.7	10690	73.7	10690	73.7	10690	73.7	8860	61.1
		18.00	26.79	0.362	9.19	12850	88.6	13070	90.1	13070	90.1	11550	79.6	11770	81.2	8860	61.1
		21.40	31.85	0.437	11.10	16200	111.7	15780	108.8	14020	96.7	14240	98.2	11770	81.2	8860	61.1
		23.20	34.53	0.478	12.14	18000	124.1	16220	111.9	14020	96.7	14240	98.2	11770	81.2	8860	61.1
		24.10	35.86	0.500	12.70	18900	130.3	16630	114.6	14020	96.7	14240	98.2	11770	81.2	8860	61.1
5 1/2	139.70	17.00	25.30	0.304	7.72	8600	59.3	9980	68.8	9980	68.8	9980	68.8	9980	68.8	8170	56.3
		20.00	29.76	0.361	9.17	11250	77.6	11850	81.7	11850	81.7	10580	73.0	10680	73.7	8170	56.3
		23.00	34.23	0.415	10.54	13550	93.4	13620	93.9	12820	88.4	13400	92.4	10680	73.7	8170	56.3
		26.00	38.69	0.476	12.09	15980	110.2	15200	104.8	12820	88.4	13400	92.4	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8.94	7950	54.8	9590	66.1	9590	66.1	9590	66.1	9590	66.1	7020	48.4
		28.00	41.67	0.417	10.59	10650	73.4	11360	78.3	11360	78.3	11360	78.3	11360	78.3	7020	48.4
		32.00	47.62	0.475	12.06	12700	87.6	12940	89.2	12940	89.2	11560	79.7	11660	80.4	7020	48.4
7	177.80	23.00	34.23	0.317	8.05	5600	38.6	8170	56.3	8170	56.3	8170	56.3	8170	56.3	6810	46.9
		26.00	38.69	0.362	9.19	7550	52.1	9330	64.3	9330	64.3	9330	64.3	9330	64.3	6810	46.9
		29.00	43.16	0.408	10.36	9400	64.8	10520	72.5	10520	72.5	10520	72.5	10520	72.5	6810	46.9
		32.00	47.62	0.453	11.51	11050	76.2	11680	80.6	11680	80.6	11680	80.6	11680	80.6	6810	46.9
		35.00	52.09	0.498	12.65	12550	86.5	12840	88.5	11750	81.0	12320	85.0	12410	85.6	6810	46.9
		38.00	56.55	0.540	13.72	13950	96.2	13740	94.8	11750	81.0	12320	85.0	12410	85.6	6810	46.9

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread

DIMENSION (STANDARD DRIFT SIZE)

VA-S-125-EP

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE RESISTANCE									
						all thread types		VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	10050	69.3	13190	91.0	13190	91.0	13190	91.0	13190	91.0	12650	87.2
		13.50	20.09	0.290	7.37	13500	93.1	15310	105.6	15310	105.6	15130	104.3	15310	105.6	12650	87.2
		15.10	22.47	0.337	8.56	17100	117.9	17790	122.7	16620	114.6	17790	122.7	15460	106.6	12650	87.2
5	127.00	15.00	22.32	0.296	7.52	11600	80.0	14060	97.0	14060	97.0	14060	97.0	14060	97.0	11660	80.4
		18.00	26.79	0.362	9.19	16400	113.1	17200	118.5	17200	118.5	15200	104.8	15490	106.8	11660	80.4
		21.40	31.85	0.437	11.10	21200	146.2	20760	143.1	18440	127.2	18730	129.2	15490	106.8	11660	80.4
		23.20	34.53	0.478	12.14	23600	162.7	21350	147.2	18440	127.2	18730	129.2	15490	106.8	11660	80.4
		24.10	35.86	0.500	12.70	24700	170.3	21880	150.9	18440	127.2	18730	129.2	15490	106.8	11660	80.4
5 1/2	139.70	17.00	25.30	0.304	7.72	9950	68.6	13130	90.5	13130	90.5	13130	90.5	13130	90.5	10750	74.1
		20.00	29.76	0.361	9.17	14000	96.5	15590	107.5	15590	107.5	13920	96.0	14060	96.9	10750	74.1
		23.00	34.23	0.415	10.54	17300	119.3	17920	123.6	16880	116.4	17620	121.5	14060	96.9	10750	74.1
		26.00	38.69	0.476	12.09	21220	146.3	20000	137.9	16880	116.4	17620	121.5	-	-	-	-
6 5/8	168.28	24.00	35.72	0.352	8.94	9250	63.8	12620	87.0	12620	87.0	12620	87.0	12620	87.0	9230	63.7
		28.00	41.67	0.417	10.59	12850	88.6	14950	103.1	14950	103.1	14950	103.1	14950	103.1	9230	63.7
		32.00	47.62	0.475	12.06	15950	110.0	17030	117.4	17030	117.4	15220	104.9	15340	105.8	9230	63.7
7	177.80	23.00	34.23	0.317	8.05	6000	41.4	10760	74.2	10760	74.2	10760	74.2	10760	74.2	8960	61.8
		26.00	38.69	0.362	9.19	8550	59.0	12280	84.7	12280	84.7	12280	84.7	12280	84.7	8960	61.8
		29.00	43.16	0.408	10.36	10800	74.5	13840	95.4	13840	95.4	13840	95.4	13840	95.4	8960	61.8
		32.00	47.62	0.453	11.51	13200	91.0	15370	106.0	15370	106.0	15370	106.0	15370	106.0	8960	61.8
		35.00	52.09	0.498	12.65	15350	105.8	16900	116.5	15460	106.6	16220	111.8	16330	112.6	8960	61.8
		38.00	56.55	0.540	13.72	17300	119.3	18080	124.7	15460	106.6	16220	111.8	16330	112.6	8960	61.8

BC ... Buttress thread | SC ... Short round thread | LC ... Long round thread



VA-SS-110-EP/VA-S-110-EP

SC		LC		COLLAPSE RESISTANCE all thread types		INTERNAL YIELD PRESSURE RESISTANCE															
						VAsuperior		VAGT		VAroughneck		BC regular		BC special clearance		SC		LC			
psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
10030	69.1	10030	69.1	9500	65.5	11610	80.0	11610	80.0	11610	80.0	11610	80.0	11130	76.7	11610	80.0	11610	80.0	11610	80.0
11630	80.2	11630	80.2	12450	85.8	13470	92.9	13470	92.9	13310	91.7	13470	92.9	11130	76.7	13470	92.9	13470	92.9	13470	92.9
12210	84.2	12650	87.2	15500	106.9	15650	107.9	14620	100.8	15650	107.9	13610	93.8	11130	76.7	14130	97.4	14650	100.9		
10690	73.7	10690	73.7	10750	74.1	12370	85.3	12370	85.3	12370	85.3	12370	85.3	10260	70.7	12370	85.3	12370	85.3	12370	85.3
12180	84.0	12850	88.6	14750	101.7	15130	104.2	15130	104.2	13370	92.2	13630	93.9	10260	70.7	14100	97.2	14880	102.5		
12180	84.0	12850	88.6	18850	130.0	18270	125.9	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5		
12180	84.0	12850	88.6	20950	144.5	18780	129.4	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5		
12180	84.0	12850	88.6	22100	152.4	19250	132.7	16230	111.8	16480	113.6	13630	93.9	10260	70.7	14100	97.2	14880	102.5		
9980	68.8	9980	68.8	9400	64.8	11550	79.6	11550	79.6	11550	79.6	11550	79.6	9460	65.2	11550	79.6	11550	79.6		
11120	76.7	11730	80.9	12850	88.6	13720	94.5	13720	94.5	12250	84.4	12370	85.2	9460	65.2	12870	88.7	13580	93.6		
11120	76.7	11730	80.9	15650	107.9	15770	108.7	14840	102.3	15500	106.9	12370	85.2	9460	65.2	12870	88.7	13580	93.6		
-	-	-	-	18820	129.8	17580	121.2	14840	102.3	15500	106.9	-	-	-	-	-	-	-	-	-	-
9590	66.1	9590	66.1	8650	59.6	11100	76.5	11100	76.5	11100	76.5	11100	76.5	8120	56.0	11100	76.5	11100	76.5		
11360	78.3	11360	78.3	11950	82.4	13160	90.6	13160	90.6	13160	90.6	13160	90.6	8120	56.0	13160	90.6	13160	90.6		
12070	83.2	12670	87.4	14550	100.3	14980	103.2	14980	103.2	13390	92.3	13500	93.0	8120	56.0	13970	96.3	14670	101.1		
8170	56.3	8170	56.3	5900	40.7	9460	65.2	9460	65.2	9460	65.2	9460	65.2	7880	54.3	9460	65.2	9460	65.2		
9330	64.3	9330	64.3	8450	58.3	10810	74.4	10810	74.4	10810	74.4	10810	74.4	7880	54.3	10810	74.4	10810	74.4		
10520	72.5	10520	72.5	10450	72.1	12180	83.9	12180	83.9	12180	83.9	12180	83.9	7880	54.3	12180	83.9	12180	83.9		
11680	80.6	11680	80.6	12500	86.2	13530	93.2	13530	93.2	13530	93.2	13530	93.2	7880	54.3	13530	93.2	13530	93.2		
12650	87.2	12840	88.5	14400	99.3	14870	102.5	13600	93.7	14270	98.3	14370	99.0	7880	54.3	14650	101.0	14870	102.5		
12650	87.2	13310	91.8	16100	111.0	15910	109.7	13600	93.7	14270	98.3	14370	99.0	7880	54.3	14650	101.0	15410	106.2		

SC		LC	
psi	MPa	psi	MPa
13190	91.0	13190	91.0
15310	105.6	15310	105.6
16060	110.8	16650	114.8
14060	97.0	14060	97.0
16030	110.5	16900	116.6
16030	110.5	16900	116.6
16030	110.5	16900	116.6
16030	110.5	16900	116.6
13130	90.5	13130	90.5
14630	100.9	15440	106.5
14630	100.9	15440	106.5
-	-	-	-
12620	87.0	12620	87.0
14950	103.1	14950	103.1
15880	109.5	16670	115.0
10760	74.2	10760	74.2
12280	84.7	12280	84.7
13840	95.4	13840	95.4
15370	106.0	15370	106.0
16650	114.8	16900	116.5
16650	114.8	17520	120.8



# VA – DEEP WELL – SERIES

Seamless Casing and Tubing based on the requirements of API specification 5CT  
for use in deep wells.

## Marking

“VA-D-...” (... stands e.g. for 125, 140 or 150). Deep Well Grades are shipped WITHOUT API monogram.

## Chemical composition

GRADE	VA-D-125	VA-D-140	VA-D-150
C	0.35	0.35	0.35
Mn	1.90	1.90	1.90
Mo	0.85	0.85	0.85
Cr	1.50	1.50	1.50
Ni	0.25	0.25	0.25
Cu	0.25	0.25	0.25
P	0.020	0.020	0.020
S	0.015	0.015	0.015
Si	0.45	0.45	0.45

## Properties

	GRADE		YIELD STRENGTH		TENSILE STRENGTH		ELONGATION	HARDNESS			
			ksi	MPa	ksi	MPa		%	MEAN HARDNESS VALUE	WALL	ALLOWABLE HARDNESS VARIATION
									HRC	mm/inch	HRC
	VA-D-125 (-HC/EP)	min.	125	862	135	931	API SPEC 5CT formula	no limit	≤ 12.7 / 0.5	3	
		max.	150	1034					> 12.7 / 0.5	4	
Testing frequency	OD ≤ 4 1/2		1/200					1 sample / 200 (4 quadrants)			
	OD > 4 1/2		1/100								
	VA-D-140 (-HC/EP)	min.	140	965	150	1034	API SPEC 5CT formula	no limit	≤ 12.7 / 0.5	3	
		max.	165	1138					> 12.7 / 0.5	4	
Testing frequency	OD ≤ 4 1/2		1/200					1 sample / 200 (4 quadrants)			
	OD > 4 1/2		1/100								
	VA-D-150 (-HC/EP)	min.	150	1034	160	1103	API SPEC 5CT formula	no limit	≤ 12.7 / 0.5	3	
		max.	175	1207					> 12.7 / 0.5	4	
Testing frequency	OD ≤ 4 1/2		1/200					1 sample / 200 (4 quadrants)			
	OD > 4 1/2		1/100								

## Inspection and testing

According to API specification 5CT. All pipes are subject to a 100% coverage ultrasonic testing inspection for wall thickness.

NON-DESTRUCTIVE TESTING			Acceptance (inspection) levels	
Flux Leakage Inspection (Pipe Body)	Ultrasonic Inspection (Pipe Body)	Magnetic Particle Inspection (Pipe Ends)	Internal Longitudinal & Transverse	External Longitudinal & Transverse
A	A	R	L2 (5 % nWT)	L2 (5 % nWT)

A one method or a combination of methods at manufacturer's option  
 R required  
 nWT nominal Wall Thickness  
 L... acceptance level

## General

QUENCHED & TEMPERED	HOT ROTARY STRAIGHTENING	API MONOGRAM	LOT TRACEABILITY
YES	YES	NO	YES

		CHARPY V-NOTCH FULL SIZE 10 x 10 MM (0°C/32°F)							
	GRAIN SIZE	TRANSVERSAL				LONGITUDINAL			
		Average		Individual		Average		Individual	
		J	ft.lbs	J	ft.lbs	J	ft.lbs	J	ft.lbs
	ASTM 5 or finer	45	33	30	22	75	55	50	37
	Statistical evidence	1/200							
		1/100							
	ASTM 5 or finer	40	30	27	20	65	48	43	32
	Statistical evidence	1/200							
		1/100							
	ASTM 5 or finer	30	22	20	15	50	37	33	25
	Statistical evidence	1/200							
		1/100							

## PERFORMANCE PROPERTIES – TUBING

OUTSIDE DIAMETER		WEIGHT				WALL THICKNESS		GRADE	PIPE BODY					
		NU		EU					COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		YIELD STRENGTH	
inch	mm	ppf	kg/m	ppf	kg/m	inch	mm		psi	MPa	psi	MPa	lb	kN
1.9	48.26	2.75	4.09	2.90	4.32	0.145	3.68	VA-D-125	16390	113.00	16680	115.00	99900	444
				VA-D-140	17860			123.14	18680	128.79	112000	498		
				VA-D-150	18790			129.55	20020	138.03	120000	534		
		3.65	5.43	3.73	5.55	0.200	5.08	VA-D-125	23550	162.37	23030	158.78	133500	594
								VA-D-140	26370	181.81	25790	177.81	150000	667
2 3/8	60.32	4.60	6.85	4.70	6.99	0.190	4.83	VA-D-125	17940	123.69	17520	120.80	163200	726
				VA-D-140	19620			135.27	19620	135.27	183000	814		
				VA-D-150	20710			142.79	21020	144.93	196000	872		
		5.80	8.63	5.95	8.85	0.254	6.45	VA-D-125	23870	164.58	23390	161.27	211600	941
								VA-D-140	26730	184.30	26190	180.57	237000	1054
								VA-D-150	28640	197.46	28060	193.47	254000	1130
2 7/8	73.02	6.40	9.52	6.50	9.67	0.217	5.51	VA-D-125	16060	110.73	16500	113.76	226600	1008
				VA-D-140	17480			120.52	18480	127.41	254000	1130		
				VA-D-150	18380			126.72	19800	136.52	272000	1210		
		7.80	11.61	7.90	11.76	0.276	7.01	VA-D-125	21700	149.61	21000	144.79	281800	1254
								VA-D-140	24300	167.54	23520	162.16	316000	1406
								VA-D-150	26040	179.54	25200	173.75	338000	1503
		8.60	12.80	8.70	12.95	0.308	7.82	VA-D-125	23910	164.86	23430	161.54	310400	1381
								VA-D-140	26780	184.64	26240	180.92	348000	1548
								VA-D-150	28690	197.81	28110	193.81	373000	1659
3 1/2	88.90	9.20	13.69	9.30	13.84	0.254	6.45	VA-D-125	14880	102.59	15870	109.42	323700	1440
				VA-D-140	16140			111.28	17770	122.52	363000	1615		
				VA-D-150	16930			116.73	19040	131.28	388000	1726		
		10.20	15.18	-	-	0.289	7.34	VA-D-125	18940	130.59	18060	124.52	364400	1621
								VA-D-140	20770	143.20	20230	139.48	408000	1815
								VA-D-150	21950	151.34	21680	149.48	437000	1944
		12.70	18.90	12.95	19.27	0.375	9.52	VA-D-125	23900	164.78	23430	161.54	460000	2046
								VA-D-140	26770	184.57	26240	180.92	515000	2291
								VA-D-150	28690	197.81	28110	193.81	552000	2455
								VA-D-125	29380	202.57	29750	205.12	565300	2515
15.50	23.07	-	-	0.476	10.92	VA-D-140	32900	226.84	33320	229.73	633000	2816		
						VA-D-150	35250	243.04	35700	246.14	678000	3016		
						VA-D-125	12010	82.81	14320	98.73	384300	1709		
4	101.60	10.70	15.92	11.00	16.37	0.262	6.65	VA-D-140	12870	88.73	16040	110.59	430000	1913
				VA-D-150	13380			92.25	17180	118.45	461000	2051		
				VA-D-125	18900			130.31	18040	124.38	475500	2115		
		13.20	19.64	-	-	0.330	8.38	VA-D-140	20720	142.86	20210	139.34	533000	2371
								VA-D-150	21900	150.99	21650	149.27	571000	2540
		16.10	23.96	-	-	0.415	10.54	VA-D-125	23250	160.30	22700	156.51	584200	2599
								VA-D-140	26040	179.54	25420	175.26	654000	2909
								VA-D-150	27900	192.36	27230	187.74	701000	3118
4 1/2	114.30	12.60	18.75	12.75	18.97	0.271	6.88	VA-D-125	9880	68.12	13170	90.80	449800	2001
				VA-D-140	10440			71.98	14750	101.70	504000	2242		
				VA-D-150	10760			74.19	15800	108.94	540000	2402		
		15.20	22.62	-	-	0.337	8.56	VA-D-125	15830	109.14	16380	112.94	550900	2451
								VA-D-140	17220	118.73	18350	126.52	617000	2745
								VA-D-150	18110	124.86	19660	135.55	661000	2940
		17.00	25.30	-	-	0.380	9.65	VA-D-125	19320	133.21	18470	127.35	614700	2734
								VA-D-140	21620	149.06	20680	142.58	688000	3060
								VA-D-150	22880	157.75	22160	152.79	738000	3283

NU ... Non upset end | EU ... External upset end

	THREADED AND COUPLED								MAKE-UP TORQUE (OPT.) ACC. TO API RP 5C1 (+/-25%)			
	INTERNAL YIELD PRESSURE				JOINT STRENGTH							
	NU		EU		NU		EU		NU		EU	
psi	MPa	psi	MPa	lb	kN	lb	kN	lbft	Nm	lbft	Nm	
16680	115.00	16680	115.00	59600	265	99900	444	830	1125	1770	2400	
18680	128.79	18680	128.79	66800	297	112000	498	930	1261	1980	2684	
20020	138.03	20020	138.03	71500	318	120000	534	1000	1356	2120	2874	
20370	140.45	23030	158.78	93200	415	133500	594	1310	1776	2170	2942	
22820	157.34	25790	177.81	104400	464	150000	667	1460	1979	2420	3281	
24450	168.58	27630	190.50	111900	498	160000	712	1560	2115	2590	3512	
17520	120.80	17520	120.80	112600	501	163200	726	1490	2020	2640	3579	
19620	135.27	19620	135.27	126100	561	183000	814	1660	2251	2950	4000	
21020	144.93	21020	144.93	135100	601	196000	872	1780	2413	3150	4271	
23390	161.27	23210	160.03	161000	716	211600	941	2130	2888	3280	4447	
26190	180.57	26000	179.26	180300	802	237000	1054	2380	3227	3670	4976	
28060	193.47	27850	192.02	193100	859	254000	1130	2540	3444	3920	5315	
16500	113.76	16500	113.76	165000	734	226600	1008	2150	2915	3380	4583	
18480	127.41	18480	127.41	184800	822	254000	1130	2400	3254	3780	5125	
19800	136.52	19800	136.52	198000	881	272000	1210	2570	3484	4040	5477	
21000	144.79	21000	144.79	220200	979	281800	1254	2870	3891	4070	5518	
23520	162.16	23520	162.16	246700	1097	316000	1406	3210	4352	4550	6169	
25200	173.75	25200	173.75	264300	1176	338000	1503	3430	4650	4870	6603	
23430	161.54	23360	161.06	248900	1107	310400	1381	3250	4406	4430	6006	
26240	180.92	26170	180.43	278700	1240	348000	1548	3620	4908	4950	6711	
28110	193.81	28030	193.26	298700	1329	373000	1659	3880	5261	5290	7172	
15870	109.42	15870	109.42	248500	1105	323700	1440	3050	4135	4720	6399	
17770	122.52	17770	122.52	278300	1238	363000	1615	3410	4623	5270	7145	
19040	131.28	19040	131.28	298200	1326	388000	1726	3640	4935	5630	7633	
18060	124.52	-	-	289200	1286	-	-	3550	4813	-	-	
20230	139.48	-	-	323900	1441	-	-	3970	5383	-	-	
21680	149.48	-	-	347100	1544	-	-	4240	5749	-	-	
23430	161.54	23430	161.54	384800	1712	460000	2046	4730	6413	6330	8582	
26240	180.92	26240	180.92	430900	1917	515000	2291	5280	7159	7060	9572	
28110	193.81	28110	193.81	461700	2054	552000	2455	5640	7647	7560	10250	
25580	176.37	-	-	490100	2180	-	-	6020	8162	-	-	
28650	197.53	-	-	548900	2442	-	-	6720	9111	-	-	
30700	211.67	-	-	588100	2616	-	-	7190	9748	-	-	
14320	98.73	14320	98.73	274400	1221	384300	1709	3140	4257	5320	7213	
16040	110.59	16040	110.59	307300	1367	430000	1913	3510	4759	5940	8053	
17180	118.45	17180	118.45	329300	1465	461000	2051	3750	5084	6360	8623	
18040	124.38	-	-	365500	1626	-	-	4190	5681	-	-	
20210	139.34	-	-	409400	1821	-	-	4670	6332	-	-	
21650	149.27	-	-	438700	1951	-	-	5000	6779	-	-	
22700	156.51	-	-	474300	2110	-	-	5430	7362	-	-	
25420	175.26	-	-	531200	2363	-	-	6060	8216	-	-	
27230	187.74	-	-	569100	2531	-	-	6490	8799	-	-	
13170	90.80	13170	90.80	325900	1450	449800	2001	3620	4908	5960	8081	
14750	101.70	14750	101.70	365000	1624	504000	2242	4040	5477	6650	9016	
15800	108.94	15800	108.94	391100	1740	540000	2402	4320	5857	7120	9653	
16380	112.94	-	-	427000	1899	-	-	4740	6426	-	-	
18350	126.52	-	-	478300	2128	-	-	5300	7186	-	-	
19660	135.55	-	-	512400	2279	-	-	5670	7687	-	-	
18470	127.35	-	-	490700	2183	-	-	5450	7389	-	-	
20680	142.58	-	-	549600	2445	-	-	6090	8257	-	-	
22160	152.79	-	-	588900	2620	-	-	6510	8826	-	-	

Calculated according to the regulations of API TR 5C3 and API RP 5C1.

## PERFORMANCE PROPERTIES – CASING

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		GRADE	PIPE BODY					
							COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		YIELD STRENGTH	
inch	mm	ppf	kg/m	inch	mm		psi	MPa	psi	MPa	lb	kN
4 ½	114.30	11.60	17.26	0.250	6.35	VA-D-125	8000	55.16	12150	83.77	417000	1855
						VA-D-140	8300	57.23	13610	93.84	467000	2077
						VA-D-150	8430	58.12	14580	100.52	501000	2229
		13.50	20.09	0.290	7.37	VA-D-125	11620	80.12	14110	97.28	480000	2135
						VA-D-140	12420	85.63	15800	108.94	537000	2389
						VA-D-150	12900	88.94	16930	116.73	576000	2562
		15.10	22.47	0.337	8.56	VA-D-125	15830	109.14	16380	112.94	551000	2451
						VA-D-140	17220	118.73	18350	126.52	617000	2745
						VA-D-150	18110	124.86	19660	135.55	661000	2940
5	127.00	15.00	22.32	0.296	7.52	VA-D-125	9490	65.43	12950	89.29	547000	2433
						VA-D-140	9990	68.88	14510	100.04	612000	2722
						VA-D-150	10270	70.81	15550	107.21	656000	2918
		18.00	26.79	0.362	9.19	VA-D-125	14810	102.11	15830	109.14	659000	2931
						VA-D-140	16050	110.66	17730	122.24	738000	3283
						VA-D-150	16840	116.11	18990	130.93	791000	3519
		21.40	31.85	0.437	11.10	VA-D-125	19940	137.48	19120	131.83	783000	3483
						VA-D-140	22330	153.96	21410	147.62	877000	3901
						VA-D-150	23930	164.99	22940	158.16	940000	4181
		23.20	34.53	0.478	12.14	VA-D-125	21620	149.06	20910	144.17	849000	3777
						VA-D-140	24210	166.92	23420	161.47	951000	4230
						VA-D-150	25940	178.85	25100	173.06	1018000	4528
24.10	35.86	0.500	12.70	VA-D-125	22500	155.13	21880	150.86	884000	3932		
				VA-D-140	25200	173.75	24500	168.92	990000	4404		
				VA-D-150	27000	186.16	26250	180.99	1060000	4715		
5 ½	139.70	17.00	25.30	0.304	7.72	VA-D-125	7880	54.33	12090	83.36	620000	2758
						VA-D-140	8160	56.26	13540	93.35	695000	3092
						VA-D-150	8280	57.09	14500	99.97	744000	3309
		20.00	29.76	0.361	9.17	VA-D-125	12090	83.36	14360	99.01	729000	3243
						VA-D-140	12950	89.29	16080	110.87	816000	3630
						VA-D-150	13480	92.94	17230	118.80	874000	3888
		23.00	34.23	0.415	10.54	VA-D-125	16060	110.73	16510	113.83	829000	3688
						VA-D-140	17480	120.52	18490	127.48	928000	4128
						VA-D-150	18390	126.79	19810	136.58	994000	4422
		26.80	39.88	0.500	12.70	VA-D-125	20660	142.44	19890	137.14	982000	4368
						VA-D-140	23140	159.54	22270	153.54	1100000	4893
						VA-D-150	24790	170.92	23860	164.51	1178000	5240
6 ¾	168.28	24.00	35.72	0.352	8.94	VA-D-125	7020	48.40	11620	80.12	867000	3857
						VA-D-140	7180	49.50	13020	89.77	971000	4319
						VA-D-150	7340	50.61	13950	96.18	1040000	4626
		28.00	41.67	0.417	10.59	VA-D-125	10990	75.77	13770	94.94	1016000	4519
						VA-D-140	11700	80.67	15420	106.32	1138000	5062
						VA-D-150	12120	83.56	16520	113.90	1220000	5427
		32.00	47.62	0.475	12.06	VA-D-125	14530	100.18	15680	108.11	1147000	5102
						VA-D-140	15740	108.52	17560	121.07	1284000	5712
						VA-D-150	16490	113.69	18810	129.69	1376000	6121
7	177.80	23.00	34.23	0.317	8.05	VA-D-125	4640	31.99	9900	68.26	832000	3701
						VA-D-140	4750	32.75	11090	76.46	932000	4146
						VA-D-150	4770	32.89	11880	81.91	998000	4439
		26.00	38.69	0.362	9.19	VA-D-125	6440	44.40	11310	77.98	943000	4195
						VA-D-140	6680	46.06	12660	87.29	1056000	4697
						VA-D-150	6860	47.30	13570	93.56	1132000	5035
		29.00	43.16	0.408	10.36	VA-D-125	9100	62.74	12750	87.91	1056000	4697
						VA-D-140	9550	65.84	14280	98.46	1183000	5262
						VA-D-150	9790	67.50	15300	105.49	1267000	5636
		32.00	47.62	0.453	11.51	VA-D-125	11720	80.81	14160	97.63	1165000	5182
						VA-D-140	12530	86.39	15860	109.35	1305000	5805
						VA-D-150	13020	89.77	16990	117.14	1398000	6219
		35.00	52.09	0.498	12.65	VA-D-125	14320	98.74	15560	107.28	1272000	5658
						VA-D-140	15490	106.80	17430	120.17	1424000	6334
						VA-D-150	16230	111.90	18680	128.79	1526000	6788
38.00	56.55	0.540	13.72	VA-D-125	16760	115.56	16880	116.38	1370000	6094		
				VA-D-140	18280	126.04	18910	130.38	1535000	6828		
				VA-D-150	19250	132.72	20260	139.69	1644000	7313		

LC ... Long round thread | BC ... Buttress thread

THREADED AND COUPLED									MAKE-UP TORQUE (OPTIMUM) +/- 25%	
INTERNAL YIELD PRESSURE				JOINT STRENGTH						
LC		BC		LC		BC		LC		
psi	MPa	psi	MPa	lb	kN	lb	kN	lbft	Nm	
12150	83.77	12150	83.77	301000	1339	420000	1868	3370	4569	
13610	93.84	13610	93.84	334000	1486	467000	2077	3760	5098	
14580	100.52	14580	100.52	357000	1588	498000	2215	4030	5464	
14110	97.28	14110	97.28	365000	1624	482000	2144	4090	5545	
15800	108.94	15800	108.94	406000	1806	537000	2389	4570	6196	
16930	116.73	16930	116.73	433000	1926	573000	2549	4880	6616	
16380	112.94	15310	105.56	438000	1948	554000	2464	4910	6657	
18350	126.52	17150	118.24	487000	2166	616000	2740	5480	7430	
19660	135.55	18370	126.66	519000	2309	658000	2927	5860	7945	
12950	89.29	12950	89.29	420000	1868	548000	2438	4650	6304	
14510	100.04	14510	100.04	466000	2073	610000	2713	5200	7050	
15550	107.22	15550	107.21	497000	2211	651000	2896	5560	7538	
15840	109.21	15490	106.80	535000	2383	661000	2940	5930	8040	
17730	122.24	17350	119.62	594000	2642	735000	3269	6620	8975	
18990	130.93	18590	128.17	634000	2820	785000	3492	7090	9613	
16900	116.52	15490	106.80	662000	2945	785000	3492	7340	9952	
18930	130.52	17350	119.62	735000	3269	873000	3883	8200	11118	
20290	139.89	18590	128.17	785000	3492	932000	4146	8770	11890	
16900	116.52	15490	106.80	729000	3243	851000	3785	8090	10968	
18930	130.52	17350	119.62	810000	3603	947000	4212	9040	12256	
20290	139.89	18590	128.17	864000	3843	1011000	4497	9670	13111	
16900	116.52	15490	106.80	765000	3403	886000	3941	8490	11511	
18930	130.52	17350	119.62	850000	3781	985000	4381	9480	12853	
20290	139.89	18590	128.17	907000	4035	1052000	4680	10140	13748	
12090	83.36	12090	83.36	480000	2135	620000	2758	5170	7009	
13540	93.35	13540	93.35	534000	2375	690000	3069	5770	7823	
14500	99.97	14500	99.97	569000	2531	736000	3274	6170	8365	
14360	99.01	14060	96.94	592000	2633	728000	3238	6360	8623	
16080	110.87	15740	108.52	657000	2922	810000	3603	7110	9640	
17230	118.80	16870	116.31	701000	3118	865000	3848	7600	10304	
15440	106.45	14060	96.94	694000	3087	828000	3683	7460	10114	
17290	119.21	15740	108.52	771000	3430	921000	4097	8340	11307	
18520	127.69	16870	116.31	823000	3661	984000	4377	8920	12094	
15440	106.45	14060	96.94	851000	3785	981000	4364	9150	12406	
17290	119.21	15740	108.52	946000	4208	1092000	4857	10230	13870	
18520	127.69	16870	116.31	1009000	4488	1166000	5187	10940	14832	
11620	80.12	11620	80.12	701000	3118	860000	3825	7170	9721	
13020	89.77	13020	89.77	779000	3465	957000	4257	8010	10860	
13950	96.18	13950	96.18	831000	3696	1022000	4546	8570	11619	
13770	94.94	13770	94.94	855000	3803	1008000	4484	8740	11850	
15420	106.32	15420	106.32	949000	4221	1122000	4991	9760	13233	
16520	113.90	16520	113.90	1013000	4506	1198000	5329	10450	14168	
15680	108.11	15340	105.76	988000	4395	1137000	5058	10100	13693	
17560	121.07	17190	118.52	1098000	4884	1266000	5631	11290	15307	
18810	129.69	18410	126.94	1171000	5209	1352000	6014	12080	16378	
9900	68.26	9900	68.26	655000	2914	823000	3661	6600	8948	
11090	76.46	11090	76.46	727000	3234	917000	4079	7370	9992	
11880	81.91	11880	81.91	776000	3452	979000	4355	7890	10697	
11310	77.98	11310	77.98	769000	3421	933000	4150	7750	10507	
12660	87.29	12660	87.29	854000	3799	1039000	4622	8660	11741	
13570	93.56	13570	93.56	911000	4052	1110000	4938	9270	12568	
12750	87.91	12750	87.91	884000	3932	1045000	4648	8920	12094	
14280	98.46	14280	98.46	983000	4373	1163000	5173	9960	13504	
15300	105.49	15300	105.49	1048000	4662	1242000	5525	10660	14453	
14160	97.63	13220	91.15	996000	4430	1153000	5129	10050	13626	
15860	109.35	14810	102.11	1107000	4924	1284000	5712	11220	15212	
16990	117.14	15860	109.35	1181000	5253	1371000	6099	12010	16283	
14440	99.56	13220	91.15	1106000	4920	1258000	5596	11150	15117	
16170	111.49	14810	102.11	1229000	5467	1401000	6232	12460	16893	
17330	119.49	15860	109.35	1311000	5832	1496000	6655	13330	18073	
14440	99.56	13220	91.15	1207000	5369	1356000	6032	12170	16500	
16170	111.49	14810	102.11	1341000	5965	1510000	6717	13600	18439	
17330	119.49	15860	109.35	1430000	6361	1612000	7171	14550	19727	

Some joints strengths are higher than the corresponding pipe body yield strength.

# DEEP WELL GRADES IN COMBINATION WITH HIGH COLLAPSE

This combination fulfills the requirements of API specification 5CT for use in deep well applications, complying with API Specification 5CT for use in high external pressure environments for collapse values exceeding those published by API in TR 5C3 and burst values according to the API TR 5C3. For further details please check the individual sections of Deep Well Grades or High Collapse Grades.

## Marking

“VA-D-...HC” (... stands e.g. for 125, 140 or 150). All Deep Well Grades are shipped WITHOUT API monogram.

## Testing

Collapse performance numbers guaranteed on a statistical database. Collapse testing is done at the decision of VAT or if required by customer with a frequency of 1 sample (min. length is 8 times the outside diameter) per heat treatment lot.



DIMENSION (STANDARD DRIFT SIZE)						VA-D-125-HC				VA-D-140-HC				VA-D-150-HC			
OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE	
inch	mm	ppf	kg/m	inch	mm	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa
4 1/2	114.30	11.60	17.26	0.250	6.35	10250	70.67	12150	83.77	10900	75.15	13610	93.84	11050	76.19	14580	100.52
		13.50	20.09	0.290	7.37	13900	95.84	14100	97.22	14950	103.08	15790	108.87	15400	106.18	16920	116.66
		15.10	22.47	0.337	8.56	17700	122.04	16380	112.94	19500	134.45	18350	126.52	20350	140.31	19660	135.55
5	127.00	15.00	22.32	0.296	7.52	11800	81.36	12950	89.29	13200	91.01	14500	99.97	13550	93.42	15540	107.14
		18.00	26.79	0.362	9.19	16800	115.83	15840	109.21	18450	127.21	17740	122.31	19200	132.38	19010	131.07
		21.40	31.85	0.437	11.10	21800	150.30	19120	131.83	24000	165.47	21410	147.62	25300	174.44	22940	158.16
		23.20	34.53	0.478	12.14	24350	167.89	20910	144.17	27000	186.16	23420	161.47	28500	196.50	25100	173.06
		24.10	35.86	0.500	12.70	25700	177.19	21880	150.86	28500	196.50	24500	168.92	29000	199.95	26250	180.99
5 1/2	139.70	17.00	25.30	0.304	7.72	10150	69.98	12090	83.36	10750	74.12	13540	93.35	10900	75.15	14510	100.04
		20.00	29.76	0.361	9.17	14400	99.28	14360	99.01	15750	108.59	16080	110.87	16000	110.32	17230	118.80
		23.00	34.23	0.415	10.54	17900	123.42	16510	113.83	19750	136.17	18490	127.48	20600	142.03	19810	136.58
		26.80	39.88	0.500	12.70	22900	157.89	19890	137.14	25300	174.44	22270	153.54	26500	182.71	23860	164.51
6 5/8	168.28	24.00	35.72	0.352	8.94	9450	65.15	11620	80.12	9550	65.84	13020	89.77	9700	66.88	13950	96.18
		28.00	41.67	0.417	10.59	13250	91.35	13770	94.94	14200	97.90	15420	106.32	14600	100.66	16520	113.90
		32.00	47.62	0.475	12.06	16550	114.11	15680	108.11	18150	125.14	17570	121.14	18850	129.97	18820	129.76
7	177.80	23.00	34.23	0.317	8.05	6100	42.06	9910	68.33	6200	42.75	11100	76.53	6250	43.09	11890	81.98
		26.00	38.69	0.362	9.19	8750	60.33	11310	77.98	8900	61.36	12670	87.36	9050	62.40	13580	93.63
		29.00	43.16	0.408	10.36	11400	78.60	12750	87.91	12000	82.74	14280	98.46	12250	84.46	15300	105.49
		32.00	47.62	0.453	11.51	14000	96.53	14160	97.63	15050	103.77	15860	109.35	15550	107.21	16990	117.14
		35.00	52.09	0.498	12.65	16350	112.73	15560	107.28	17900	123.42	17430	120.17	18600	128.24	18680	128.79
		38.00	56.55	0.540	13.72	18500	127.55	16880	116.38	20450	141.00	18900	130.31	21350	147.20	20250	139.62



# VA – LOW TEMPERATURE – SERIES

Seamless Casing and Tubing complying with API specification 5CT for use in low temperature applications. The table below demonstrates values exceeding the API specification 5CT for the pipe body and coupling (impact values, hardness, non-destructive testing).

## Marking

According to API specification 5CT plus additional marking of “VA-LT-...” (… stands e.g. for N80-Q or L80-1 etc.). Upon request API monogram will be applied.

## Mechanical properties and chemical composition

According to API specification 5CT. All grades, except J55/K55 are subject to hot rotary straightening.

Charpy V-notch / 10x10mm - Full Size / Longitudinal / -45 °C / -49 °F

Higher impact values or at lower temperatures on request.

Performance properties as listed in API TR 5C3 under the corresponding API grade (see appendix).



	MIN. INDIVIDUAL		MIN. AVERAGE	
	J	ft.lbs	J	ft.lbs
VA-LT-J55	30	22,1	40	29,5
VA-LT-K55	30	22,1	40	29,5
VA-LT-N80-Q	60	44,3	70	51,6
VA-LT-L80-1	60	44,3	70	51,6
VA-LT-C90-1	50	36,9	60	44,3
VA-LT-R95	50	36,9	60	44,3
VA-LT-T95-1	50	36,9	60	44,3
VA-LT-C110	40	29,5	50	36,9
VA-LT-P110	40	29,5	50	36,9
VA-LT-Q125-1	30	22,1	40	29,5

Maximum Hardness Variation (HrC) for wall thickness

≤ 12.70 mm	≤ 0.50 inch	3
12.71 – 19.04 mm	0.51 – 0.74 inch	4
19.05 – 25.39 mm	0.75 – 0.99 inch	5
≥ 25.40 mm	≥ 1 inch	6

## Inspection and testing

According to API specification 5CT. All pipes are subject to a 100% coverage ultrasonic testing inspection for wall thickness (min. 93.75% average wall).

### NON-DESTRUCTIVE TESTING

Flux Leakage Inspection (Pipe Body)	Ultrasonic Inspection (Pipe Body)	Magnetic Particle Inspection (Pipe Ends)	Acceptance (inspection) levels	
			Internal Longitudinal & Transverse	External Longitudinal & Transverse
A	A	R	L2 (5 % nWT)	L2 (5 % nWT)

A one method or a combination of methods at manufacturer's option required

L acceptance level  
nWT nominal Wall Thickness

# MILD SWEET GAS – SERIES

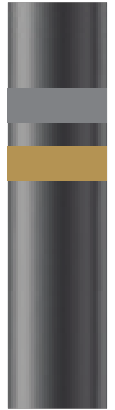
Seamless Casing and Tubing based on the requirements of API specification 5CT for mildly corrosive environments where in combination with an adequate inhibition program a higher corrosion resistance compared to regular API grades can be expected.

## FERRITE-PEARLITE VA-FP-...-1CR

**Marking** “VA-FP-...-1CR” (... stands e.g. for 55 or 75 etc.).  
All FP grades are shipped WITHOUT API monogram.

### Mechanical properties and chemical composition

GRADE		%Cr	YIELD STRENGTH		TENSILE STRENGTH		ELONGATION	HARDNESS	IMPACT
			ksi	MPa	ksi	MPa			
VA-FP-55-1CR	min.	0.85	55	379	80	552			
	max	1.15							
VA-FP-75-1CR	min.	0.85	75	517	100	690	API SPEC. 5CT formula	n.a.	n.a.
	max	1.15							
VA-FP-80-1CR	min.	0.85	80	552	105	724			
	max	1.15							



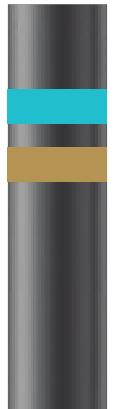
## QUENCHED AND TEMPERED VA-...-1CR

Grade acc. to API Spec. 5CT with 1% Chromium content.

**Marking** “VA-...-1CR” (...stands e.g. for L80-1 or P110 etc.), API monogram will be applied.

### Mechanical properties and chemical composition

GRADE		%Cr	YIELD STRENGTH		TENSILE STRENGTH		ELONGATION	HARDNESS
			ksi	MPa	ksi	MPa		
VA-N80-Q-1CR	min.	0.85	80	552	100	689	API SPEC. 5CT formula	-
	max	1.15	110	758				
VA-L80-1-1CR	min.	0.85	80	552	95	655	API SPEC. 5CT formula	23
	max	1.15	95	655				
VA-R95-1CR	min.	0.85	95	655	105	724	API SPEC. 5CT formula	-
	max	1.15	110	758				
VA-P110-1CR	min.	0.85	110	758	125	862	API SPEC. 5CT formula	-
	max	1.15	140	965				



## QUENCHED AND TEMPERED VA-...-3CR

Grade acc. to API Spec. 5CT with 3% Chromium content.

**Marking** “VA-...-3CR” (...stands e.g. for L80-1 or P110 etc.), API monogram will be applied.

### Mechanical properties and chemical composition

GRADE		%Cr	YIELD STRENGTH		TENSILE STRENGTH		ELONGATION	HARDNESS
			ksi	MPa	ksi	MPa		
VA-N80-Q-3CR	min.	2.85	80	552	100	689	API SPEC. 5CT formula	-
	max	3.25	110	758				
VA-L80-1-3CR	min.	2.85	80	552	95	655	API SPEC. 5CT formula	23
	max	3.25	95	655				
VA-R95-3CR	min.	2.85	95	655	105	724	API SPEC. 5CT formula	-
	max	3.25	110	758				
VA-P110-3CR	min.	2.85	110	758	125	862	API SPEC. 5CT formula	-
		3.25	140	965				

Please note: Not qualified for use in sour gas applications according to NACE MR0175/ISO15156.



# SWEET GAS – SERIES

Seamless Casing and Tubing based on the requirements of API specifications 5CT for corrosive environments. A higher corrosion resistance compared to regular API grades can be expected.

## QUENCHED AND TEMPERED VA-...-13CR

Grade acc. to API Spec. 5CT with 13% Chromium content.

**Marking** “VA-...-13CR” (...stands e.g. for 95)  
Shipped WITHOUT API monogram.

### Mechanical properties and chemical composition

GRADE		%Cr	YIELD STRENGTH		TENSILE STRENGTH		ELONGATION	HARDNESS
			ksi	MPa	ksi	MPa	%	HRC
VA-95-13CR	min.	12.00	95	655	105	724	API SPEC. 5CT formula	-
	max.	14.00	110	758				



# COLOR CODING

In order to readily identify proprietary grades, voestalpine Tubulars developed its own color coding system. Our proprietary grades are marked with a golden color band and additional color band(s) indicating the specific proprietary series.

























For further details and a complete overview about all grades and pipe markings please check QR code.

## PROPRIETARY GRADES

<b>Gold</b>		voestalpine Tubulars Proprietary Grade
<b>Green</b>		High Collapse
<b>Double Orange</b>		Sour Service
<b>Orange</b>		Sour Service (Mild Solution)
<b>Purple</b>		Deep Well
<b>Grey</b>		Mild Sweet Gas
<b>White</b>		Sweet Gas
<b>Turquoise</b>		Quenched and Tempered
<b>Blue</b>		Low Temperature
<b>Pink</b>		Enhanced Properties
<b>Double Pink</b>		Extreme Properties

## GRADES CORRESPONDING TO API

	H		L80-1		
	J55				C110
			L80-13Cr		Q125-1
	K55				Grade 140
	M65		C90-1		Grade 150
	Grade 75		T95-1		
	N80-1		R95		
	N80-Q		P110		
					

## EXAMPLE

VA-S-110-HC

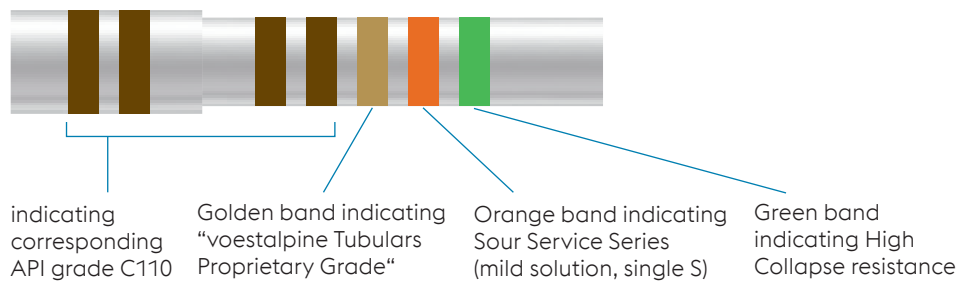
### COUPLINGS AND PUP JOINTS / ACCESSORIES

shorter than 3 ft / 0.91 m  
API marking only!



### PUP JOINTS / ACCESSORIES

from 3 ft / 0.91 m up to 5.99 ft / 1.82 m



### PIPE AND PUP JOINTS / ACCESSORIES

from 6 ft / 1.83 m



# SERVICES



myTubulars

## myTubulars APP PRODUCT DATASHEETS, FIELD SERVICE AND LICENSEES

Generate datasheets and load envelopes containing dimension and performance data for products provided by voestalpine Tubulars with our Datasheet Generator. You can quickly and easily check the product application against field requirements in advance also on your tablet or smartphone by using the myTubulars App.

myTubulars is available for all iOS and Android devices for free in the App stores.

### GET THE APP!

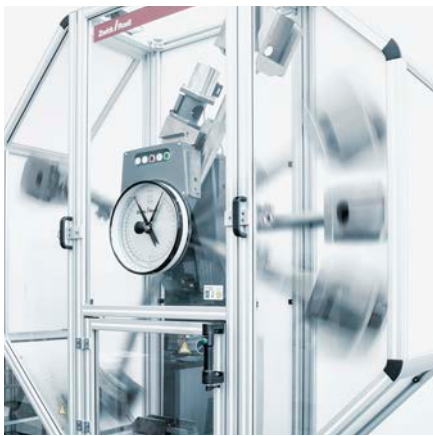


Field Service during the installation can be provided upon request. Please visit the Customer Service site on our web page [www.voestalpine.com/tubulars](http://www.voestalpine.com/tubulars)



# WHY voestalpine Tubulars?

Support from material and product selection, in-house material and product development, to final product and installation consulting from one source.



**PRODUCT DEVELOPMENT**



**CONNECTION DEVELOPMENT**



**MATERIAL DEVELOPMENT**



**PROCESS DEVELOPMENT**



**TAILOR-MADE SOLUTIONS**



**FIELD SERVICE**

# APPENDIX

## PERFORMANCE PROPERTIES - TUBING ACCORDING API TR 5C3 AND API RP 5C1

OUTSIDE DIAMETER		WEIGHT				WALL THICKNESS		GRADE	PIPE BODY					
		NU		EU					COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		YIELD STRENGTH	
inch	mm	ppf	kg/m	ppf	kg/m	inch	mm		psi	MPa	psi	MPa	lb	kN
1.9	48.26	2.75	4.09	2.90	4.32	0.145	3.68	J55	7750	53.4	7350	50.6	43900	195.3
								N80-Q	11280	77.7	10680	73.6	63900	284.2
								L80-1	11280	77.7	10680	73.6	63900	284.2
								C90-1	12620	87.0	12020	82.8	71900	319.8
								T95-1	13190	90.9	12690	87.4	75900	337.6
								P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
	-	-	3.73	5.55	0.200	5.08	J55	10360	71.4	10130	69.8	58700	261.1	
							N80-Q	15070	103.8	14740	101.6	85400	379.9	
							L80-1	15070	103.8	14740	101.6	85400	379.9	
							C90-1	16950	116.8	16580	114.2	96100	427.5	
							T95-1	17890	123.3	17500	120.6	101500	451.5	
							P110	20720	142.8	20260	139.6	117500	522.6	
2 3/8	73.02	4.60	6.85	4.70	6.99	0.190	4.83	J55	8100	55.8	7700	53.1	71700	318.9
								N80-Q	11780	81.2	11200	77.2	104300	463.9
								L80-1	11780	81.2	11200	77.2	104300	463.9
								C90-1	13250	91.3	12600	86.8	117400	522.2
								T95-1	13980	96.3	13300	91.6	123900	551.1
								P110	16130	111.1	15400	106.1	143400	637.8
	5.80	8.63	5.95	8.85	0.254	6.45	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
							N80-Q	15280	105.3	14970	103.1	135400	602.3	
							L80-1	15280	105.3	14970	103.1	135400	602.3	
							C90-1	17190	118.4	16840	116.0	152300	677.4	
							T95-1	18150	125.1	17780	122.5	160700	714.8	
							P110	21010	144.8	20590	141.9	186100	827.8	
2 7/8	73.02	6.40	9.52	6.50	9.67	0.217	5.51	J55	7680	52.9	7260	50.0	99700	443.5
								N80-Q	11170	77.0	10570	72.8	145000	645.0
								L80-1	11170	77.0	10570	72.8	145000	645.0
								C90-1	12380	85.3	11890	81.9	163100	725.5
								T95-1	12940	89.2	12550	86.5	172100	765.5
								P110	14550	100.2	14530	100.1	199300	886.5
	7.80	11.61	7.90	11.76	0.276	7.01	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
							N80-Q	13890	95.7	13440	92.6	180300	802.0	
							L80-1	13890	95.7	13440	92.6	180300	802.0	
							C90-1	15620	107.6	15120	104.2	202900	902.5	
							T95-1	16490	113.6	15960	110.0	214100	952.3	
							P110	19090	131.5	18480	127.3	247900	1102.7	
8.60	12.80	8.70	12.95	0.308	7.82	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.		
						N80-Q	15300	105.4	15000	103.4	198700	883.8		
						L80-1	15300	105.4	15000	103.4	198700	883.8		
						C90-1	17220	118.6	16870	116.2	223600	994.6		
						T95-1	18170	125.2	17810	122.7	236000	1049.7		
						P110	21040	145.0	20620	142.1	273200	1215.2		
3 1/2	88.90	9.20	13.69	9.30	13.84	0.254	6.45	J55	7400	51.0	6990	48.2	142500	633.8
								N80-Q	10540	72.6	10160	70.0	207200	921.6
								L80-1	10540	72.6	10160	70.0	207200	921.6
								C90-1	11570	79.7	11430	78.8	233100	1036.8
								T95-1	12080	83.2	12070	83.2	246000	1094.7
								P110	13530	93.2	13970	96.3	284900	1267.2
	10.20	15.18	-	-	0.289	7.34	J55	8330	57.4	7950	54.8	160300	713.0	
							N80-Q	12120	83.5	11560	79.6	233200	1037.3	
							L80-1	12120	83.5	11560	79.6	233200	1037.3	
							C90-1	13640	94.0	13010	89.6	262400	1167.2	
							T95-1	14390	99.1	13730	94.6	276900	1231.7	
							P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	

NU ... Non Upset End | EU ... External Upset End | N.L. ... Not listed in API TR 5C3 (1st Edition) or API RP 5C1 (18th Edition)



	THREADED AND COUPLED								MAKE-UP TORQUE (OPT.) ACC. TO API RP 5C1 (+/- 25%)			
	INTERNAL YIELD PRESSURE				JOINT YIELD STRENGTH							
	NU		EU		NU		EU		NU		EU	
psi	MPa	psi	MPa	lb	kN	lb	kN	lbft	Nm	lbft	Nm	
7350	50.6	7350	50.6	26200	116.5	43900	195.3	410	560	880	1190	
10680	73.6	10680	73.6	38200	169.9	63900	284.2	570	780	1220	1650	
10680	73.6	10680	73.6	38200	169.9	63900	284.2	560	760	1190	1610	
12020	82.8	12020	82.8	42900	190.8	71900	319.8	610	830	1300	1760	
12690	87.4	12690	87.4	45300	201.5	75900	337.6	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	10130	69.8	N.L.	N.L.	58700	261.1	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	14740	101.6	N.L.	N.L.	85400	379.9	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	14740	101.6	N.L.	N.L.	85400	379.9	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	16580	114.2	N.L.	N.L.	96100	427.5	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	17500	120.6	N.L.	N.L.	101500	451.5	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	20260	139.6	N.L.	N.L.	117500	522.6	N.L.	N.L.	N.L.	N.L.	
7700	53.1	7700	53.1	49400	219.7	71700	318.9	730	990	1290	1750	
11200	77.2	11200	77.2	71900	319.8	104300	463.9	1020	1380	1800	2450	
11200	77.2	11200	77.2	71900	319.8	104300	463.9	990	1350	1760	2390	
12600	86.8	12600	86.8	80900	359.8	117400	522.2	1080	1470	1920	2610	
13300	91.6	13300	91.6	85400	379.9	123900	551.1	N.L.	N.L.	N.L.	N.L.	
15400	106.1	15400	106.1	98900	439.9	143400	637.8	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
14970	103.1	14860	102.4	103000	458.1	135400	602.3	1460	1980	2240	3040	
14970	103.1	14860	102.4	103000	458.1	135400	602.3	1420	1930	2190	2970	
16840	116.0	16720	115.2	115800	515.1	152300	677.4	1550	2110	2390	3250	
17780	122.5	17650	121.6	122300	544.0	160700	714.8	N.L.	N.L.	N.L.	N.L.	
20590	141.9	20430	140.8	141600	629.8	186100	827.8	N.L.	N.L.	N.L.	N.L.	
7260	50.0	7260	50.0	72600	322.9	99700	443.5	1050	1420	1650	2230	
10570	72.8	10570	72.8	105600	469.7	145000	645.0	1470	1990	2300	3120	
10570	72.8	10570	72.8	105600	469.7	145000	645.0	1430	1940	2250	3050	
11890	81.9	11890	81.9	118800	528.4	163100	725.5	1570	2130	2460	3340	
12550	86.5	12550	86.5	125400	557.8	172100	765.5	N.L.	N.L.	N.L.	N.L.	
14530	100.1	14530	100.1	145200	645.8	199300	886.5	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
13440	92.6	13440	92.6	140900	626.7	180300	802.0	1960	2650	2770	3760	
13440	92.6	13440	92.6	140900	626.7	180300	802.0	1910	2590	2710	3680	
15120	104.2	15120	104.2	158500	705.0	202900	902.5	2090	2840	2970	4020	
15960	110.0	15960	110.0	167300	744.2	214100	952.3	N.L.	N.L.	N.L.	N.L.	
18480	127.3	18480	127.3	193700	861.6	247900	1102.7	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
15000	103.4	14940	102.9	159300	708.6	198700	883.8	2210	3000	3020	4090	
15000	103.4	14940	102.9	159300	708.6	198700	883.8	2160	2930	2950	4000	
16870	116.2	16810	115.8	179200	797.1	223600	994.6	2370	3210	3230	4380	
17810	122.7	17740	122.2	189100	841.1	236000	1049.7	N.L.	N.L.	N.L.	N.L.	
20620	142.1	20540	141.5	219000	974.1	273200	1215.2	N.L.	N.L.	N.L.	N.L.	
6990	48.2	6990	48.2	109400	486.6	142500	633.8	1480	2010	2280	3090	
10160	70.0	10160	70.0	159100	707.1	207200	921.6	2070	2810	3200	4330	
10160	70.0	10160	70.0	159100	707.1	207200	921.6	2030	2750	3030	4240	
11430	78.8	11430	78.8	179000	796.2	233100	1036.8	2220	3010	3430	4650	
12070	83.2	12070	83.2	188700	840.7	246000	1094.7	N.L.	N.L.	N.L.	N.L.	
13970	96.3	13970	96.3	218800	973.2	284900	1267.2	N.L.	N.L.	N.L.	N.L.	
7950	54.8	N.L.	N.L.	127300	566.2	N.L.	N.L.	1720	2330	N.L.	N.L.	
11560	79.6	N.L.	N.L.	185100	823.3	N.L.	N.L.	2410	3270	N.L.	N.L.	
11560	79.6	N.L.	N.L.	185100	823.3	N.L.	N.L.	2360	3200	N.L.	N.L.	
13010	89.6	N.L.	N.L.	208300	926.5	N.L.	N.L.	2590	3510	N.L.	N.L.	
13730	94.6	N.L.	N.L.	219600	977.7	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	

Values are from API TR 5C3 (1<sup>st</sup> edition) and from API RP 5C1 (18th edition)

# APPENDIX

## PERFORMANCE PROPERTIES - TUBING ACCORDING API TR 5C3 AND API RP 5C1

OUTSIDE DIAMETER		WEIGHT				WALL THICKNESS		GRADE	PIPE BODY						
		NU		EU					COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		YIELD STRENGTH		
inch	mm	ppf	kg/m	ppf	kg/m	inch	mm		psi	MPa	psi	MPa	lb	kN	
3 1/2	88.90	12.70	18.90	12.95	19.27	0.375	9.52	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
								N80-Q	15310	105.2	15000	103.4	294600	1310.4	
								L80-1	15310	105.2	15000	103.4	294600	1310.4	
								C90-1	17220	118.6	16880	116.3	331400	1474.1	
								T95-1	18180	125.3	17810	122.7	349800	1555.9	
								P110	21050	145.0	20630	142.1	405000	1801.4	
	15.50	23.07	-	-	-	-	0.476	10.92	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
									N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
									L80-1	18800	119.1	19040	118.5	361800	1475.8
									C90-1	21150	133.7	21420	133.3	407000	1660.0
									T95-1	22330	141.1	22610	140.8	429600	1752.5
									P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
4	101.60	10.70	15.92	11.00	16.37	0.262	6.65	J55	6590	45.4	6300	43.4	169200	752.6	
								N80-Q	8800	60.6	9170	63.2	246200	1095.1	
								L80-1	8800	60.6	9170	63.2	246200	1095.1	
								C90-1	9590	66.1	10320	71.1	276900	1231.7	
								T95-1	9980	68.8	10890	75.0	292300	1300.2	
								P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
	13.20	19.64	-	-	-	-	0.330	8.38	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
									N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
									L80-1	12110	83.4	11550	79.6	304400	1354.0
									C90-1	13620	93.8	12990	89.5	342500	1523.4
									T95-1	14380	99.1	13720	94.5	361500	1608.0
									P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
4 1/2	114.30	16.10	23.96	-	-	0.415	10.54	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
								N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
								L80-1	14880	102.5	14520	100.0	373900	1663.1	
								C90-1	16740	115.3	16340	112.6	420700	1871.3	
								T95-1	17670	121.7	17250	118.9	444000	1974.9	
								P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
	12.60	18.75	12.75	18.97	-	-	0.271	6.88	J55	5730	39.5	5800	40.0	198000	880.7
									N80-Q	7500	51.7	8430	58.1	288000	1281.0
									L80-1	7500	51.7	8430	58.1	288000	1281.0
									C90-1	8120	55.9	9480	65.3	324000	1441.2
									T95-1	8410	57.9	10010	69.0	342000	1521.2
									P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
	15.20	22.62	-	-	-	-	0.337	8.56	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
									N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
									L80-1	11080	76.3	10480	72.2	352600	1568.4
									C90-1	12220	84.2	11800	81.3	396600	1764.1
									T95-1	12760	87.9	12450	85.8	418700	1862.4
									P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
17.00	25.30	-	-	-	-	0.380	9.65	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
								N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
								L80-1	12370	85.2	11820	81.4	393400	1749.8	
								C90-1	13920	95.9	13300	91.6	442600	1968.7	
								T95-1	14690	101.2	14040	96.7	467200	2078.1	
								P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	

NU ... Non Upset End | EU ... External Upset End | N.L. ... Not listed in API TR 5C3 (1st Edition) or API RP 5C1 (18th Edition)



# APPENDIX

## PERFORMANCE PROPERTIES - CASING ACCORDING API TR 5C3 AND API RP 5C1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		GRADE	PIPE BODY							
inch	mm	ppf	kg/m	inch	mm		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		YIELD STRENGTH		SC	
						psi	MPa	psi	MPa	1000 lb	kN	psi	MPa	
4 1/2	114.3	11.60	17.26	0.250	6.35	J55	4960	34.2	5350	36.9	184	817	5350	36.9
						N80-Q	4960	34.2	5350	36.9	184	817	5350	36.9
						L80-1	6350	43.8	7780	53.6	267	1188	N.L.	N.L.
						C90-1	6350	43.8	7780	53.6	267	1188	N.L.	N.L.
						T95-1	6820	47.0	8750	60.3	300	1336	N.L.	N.L.
						R95/T95-1	7030	48.4	9240	63.7	317	1411	N.L.	N.L.
						P110	7580	52.2	10690	73.7	367	1633	N.L.	N.L.
						Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
		J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		L80-1	8540	58.8	9020	62.1	307	1365	N.L.	N.L.				
		C90-1	8540	58.8	9020	62.1	307	1365	N.L.	N.L.				
	T95-1	9300	64.1	10150	69.9	345	1536	N.L.	N.L.					
	R95/T95-1	9660	66.6	10710	73.8	364	1621	N.L.	N.L.					
	P110	10690	73.7	12410	85.5	422	1877	N.L.	N.L.					
	Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
	N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
	L80-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
	C90-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
	T95-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
	R95/T95-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
	P110	14340	98.8	14420	99.4	485	2156	N.L.	N.L.					
	Q125-1	15830	109.1	16380	112.9	551	2450	N.L.	N.L.					
5	127	15.00	22.32	0.296	7.52	J55	5560	38.3	5700	39.3	241	1070	5700	39.3
						N80-Q	5560	38.3	5700	39.3	241	1070	5700	39.3
						L80-1	7250	50.0	8290	57.1	350	1556	N.L.	N.L.
						C90-1	7250	50.0	8290	57.1	350	1556	N.L.	N.L.
						T95-1	7830	53.9	9320	64.2	394	1751	N.L.	N.L.
						R95/T95-1	8110	55.9	9840	67.8	416	1848	N.L.	N.L.
						P110	8850	61.0	11400	78.5	481	2140	N.L.	N.L.
						Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
		J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		L80-1	10490	72.3	10140	69.9	422	1877	N.L.	N.L.				
		C90-1	10490	72.3	10140	69.9	422	1877	N.L.	N.L.				
	T95-1	11520	79.4	11400	78.5	475	2112	N.L.	N.L.					
	R95/T95-1	12030	82.9	12040	83.0	501	2229	N.L.	N.L.					
	P110	13470	92.8	13940	96.0	580	2581	N.L.	N.L.					
	Q125-1	14820	102.1	15840	109.1	659	2933	N.L.	N.L.					
	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
	N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
	L80-1	12760	87.9	12240	84.3	501	2229	N.L.	N.L.					
	C90-1	12760	87.9	12240	84.3	501	2229	N.L.	N.L.					
	T95-1	14360	98.9	13770	94.9	564	2508	N.L.	N.L.					
	R95/T95-1	15150	104.4	14530	100.1	595	2647	N.L.	N.L.					
	P110	17550	120.9	16820	115.9	689	3065	N.L.	N.L.					
	Q125-1	19940	137.4	19120	131.7	783	3483	N.L.	N.L.					

SC ... Short Round Thread | LC ... Long Round Thread | BC ... Buttress Thread | N.L. ... Not listed in API TR 5C3 (1st Edition) or API RP 5C1 (18th Edition)

THREADED AND COUPLED											MAKE-UP TORQUE (OPT.) ACC. TO API RP 5C1 (+/- 25%)			
INTERNAL YIELD PRESSURE				JOINT STRENGTH							BC		LC	
LC		BC		SC		LC		BC		BC		LC		
psi	MPa	psi	MPa	1000 lb	kN	1000 lb	kN	1000 lb	kN	lbft	Nm	lbft	Nm	
5350	36.9	5350	36.9	154	684	162	721	225	1000	1540	2090	1620	2200	
5350	36.9	5350	36.9	170	757	180	799	277	1230	1700	2310	1800	2430	
7780	53.6	7780	53.6	N.L.	N.L.	223	992	304	1351	N.L.	N.L.	2280	3090	
7780	53.6	7780	53.6	N.L.	N.L.	212	942	291	1293	N.L.	N.L.	2230	3030	
8750	60.3	8750	60.3	N.L.	N.L.	223	992	309	1376	N.L.	N.L.	2450	3320	
9240	63.7	9240	63.7	N.L.	N.L.	234	1041	325	1446	N.L.	N.L.	2580	3500	
10690	73.7	10690	73.7	N.L.	N.L.	279	1240	385	1713	N.L.	N.L.	3020	4100	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
9020	62.1	9020	62.1	N.L.	N.L.	270	1202	349	1552	N.L.	N.L.	2760	3740	
9020	62.1	9020	62.1	N.L.	N.L.	257	1142	334	1486	N.L.	N.L.	2710	3670	
10150	69.9	10150	69.9	N.L.	N.L.	270	1202	355	1581	N.L.	N.L.	2970	4030	
10710	73.8	10710	73.8	N.L.	N.L.	284	1261	374	1662	N.L.	N.L.	3130	4240	
12410	85.5	12410	85.5	N.L.	N.L.	338	1502	443	1969	N.L.	N.L.	3660	4960	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
14420	99.4	13460	92.7	N.L.	N.L.	406	1804	509	2262	N.L.	N.L.	4400	5960	
16380	112.9	15300	105.4	N.L.	N.L.	438	1949	554	2464	N.L.	N.L.	4910	6650	
5700	39.3	5700	39.3	207	919	223	992	293	1301	2070	2800	2230	3020	
5700	39.3	5700	39.3	228	1013	246	1096	359	1595	2280	3090	2460	3340	
8290	57.1	8290	57.1	N.L.	N.L.	311	1382	396	1759	N.L.	N.L.	3140	4250	
8290	57.1	8290	57.1	N.L.	N.L.	295	1313	379	1686	N.L.	N.L.	3080	4170	
9320	64.2	9320	64.2	N.L.	N.L.	311	1382	404	1796	N.L.	N.L.	3380	4590	
9840	67.8	9840	67.8	N.L.	N.L.	326	1451	424	1888	N.L.	N.L.	3560	4830	
11400	78.5	11400	78.5	N.L.	N.L.	388	1728	503	2236	N.L.	N.L.	4170	5650	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
10140	69.9	9910	68.3	N.L.	N.L.	396	1762	477	2122	N.L.	N.L.	4000	5420	
10140	69.9	9910	68.3	N.L.	N.L.	376	1674	457	2033	N.L.	N.L.	3930	5320	
11400	78.5	11150	76.8	N.L.	N.L.	396	1762	487	2166	N.L.	N.L.	4310	5850	
12040	83.0	11770	81.1	N.L.	N.L.	416	1851	512	2277	N.L.	N.L.	4550	6160	
13940	96.0	13620	93.8	N.L.	N.L.	495	2203	606	2697	N.L.	N.L.	5310	7210	
15840	109.1	15480	106.7	N.L.	N.L.	535	2379	661	2940	N.L.	N.L.	5930	8050	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
10810	74.5	9910	68.3	N.L.	N.L.	490	2181	537	2387	N.L.	N.L.	4950	6710	
10810	74.5	9910	68.3	N.L.	N.L.	466	2072	510	2267	N.L.	N.L.	4860	6590	
12170	83.9	11150	76.8	N.L.	N.L.	490	2181	537	2387	N.L.	N.L.	5340	7240	
12840	88.5	11770	81.1	N.L.	N.L.	515	2290	563	2506	N.L.	N.L.	5620	7630	
14870	102.5	13620	93.8	N.L.	N.L.	613	2726	671	2983	N.L.	N.L.	6580	8920	
16900	116.4	15480	106.7	N.L.	N.L.	662	2944	724	3222	N.L.	N.L.	7340	9960	

Values are from API TR 5C3 (1<sup>st</sup> edition) and from API RP 5C1 (18<sup>th</sup> edition) / Some pipe body yield strengths are higher than the corresponding joint yield strengths.

# APPENDIX

## PERFORMANCE PROPERTIES - CASING ACCORDING API TR 5C3 AND API RP 5C1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		GRADE	PIPE BODY								
inch	mm	ppf	kg/m	inch	mm		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		YIELD STRENGTH		SC		
							psi	MPa	psi	MPa	1000 lb	kN	psi	MPa	
5	127	23.20	34.53	0.478	12.14	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
						N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
						L80-1	13830	95.3	13380	92.2	543	2417	N.L.	N.L.	
						C90-1	13830	95.3	13380	92.2	565	2417	N.L.	N.L.	
						T95-1	15560	107.2	15060	103.8	611	2719	N.L.	N.L.	
						R95/T95-1	16430	113.2	15890	109.5	645	2870	N.L.	N.L.	
						P110	19020	131.0	18400	126.8	747	3323	N.L.	N.L.	
						Q125-1	21620	149.0	20910	144.1	849	3776	N.L.	N.L.	
	24.10	35.86	0.500	12.70	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
					N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.		
					L80-1	14400	99.2	14000	96.5	566	2515	N.L.	N.L.		
					C90-1	14400	99.2	14000	96.5	566	2515	N.L.	N.L.		
					T95-1	16200	111.6	15750	108.5	636	2830	N.L.	N.L.		
					R95/T95-1	17100	117.8	16630	114.6	672	2987	N.L.	N.L.		
					P110	19800	136.4	19250	132.6	778	3459	N.L.	N.L.		
					Q125-1	22500	155.0	21880	150.8	884	3930	N.L.	N.L.		
5 1/2	139.7	17.00	25.30	0.304	7.72	J55	4910	33.8	5320	36.7	273	1214	5320	36.7	
						N80-Q	4910	33.8	5320	36.7	273	1214	5320	36.7	
						L80-1	6290	43.3	7740	53.3	397	1766	N.L.	N.L.	
						C90-1	6290	43.3	7740	53.3	397	1766	N.L.	N.L.	
						T95-1	6740	46.4	8710	60.0	447	1986	N.L.	N.L.	
						R95/T95-1	6940	47.8	9190	63.3	471	2097	N.L.	N.L.	
		P110	7480	51.5	10640	73.3	546	2428	N.L.	N.L.					
		Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
		20.00	29.76	0.361	9.17	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
						N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
						L80-1	8830	60.8	9190	63.3	466	2074	N.L.	N.L.	
						C90-1	8830	60.8	9190	63.3	466	2074	N.L.	N.L.	
	T95-1					9630	66.4	10340	71.2	525	2333	N.L.	N.L.		
	R95/T95-1					10020	69.0	10910	75.2	554	2463	N.L.	N.L.		
	P110	11100	76.5	12640	87.1	641	2852	N.L.	N.L.						
	Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.						
	23.00	34.23	0.415	10.54	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
					N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.		
					L80-1	11160	76.9	10560	72.8	530	2359	N.L.	N.L.		
					C90-1	11160	76.9	10560	72.8	530	2359	N.L.	N.L.		
					T95-1	12380	85.3	11880	81.9	597	2654	N.L.	N.L.		
					R95/T95-1	12930	89.1	12540	86.4	630	2802	N.L.	N.L.		
	P110	14540	100.2	14530	100.1	729	3224	N.L.	N.L.						
	Q125-1	16060	110.7	16510	113.8	829	3686	N.L.	N.L.						

SC ... Short Round Thread | LC ... Long Round Thread | BC ... Buttress Thread | N.L. ... Not listed in API TR 5C3 (1st Edition) or API RP 5C1 (18th Edition)

THREADED AND COUPLED											MAKE-UP TORQUE (OPT.) ACC. TO API RP 5C1 (+/- 25%)			
INTERNAL YIELD PRESSURE				JOINT STRENGTH						BC		LC		
LC		BC		SC		LC		BC		lbft	Nm	lbft	Nm	
psi	MPa	psi	MPa	1000 lb	kN	1000 lb	kN	1000 lb	kN	lbft	Nm	lbft	Nm	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
10810	74.5	9910	68.3	N.L.	N.L.	540	2403	537	2387	N.L.	N.L.	5450	7400	
10810	74.5	9910	68.3	N.L.	N.L.	513	2283	510	2267	N.L.	N.L.	5350	7260	
12170	83.9	11150	76.8	N.L.	N.L.	540	2403	537	2387	N.L.	N.L.	5880	7980	
12840	88.5	11770	81.1	N.L.	N.L.	567	2523	563	2506	N.L.	N.L.	6200	8400	
14870	102.5	13620	93.8	N.L.	N.L.	675	3004	671	2983	N.L.	N.L.	7250	9830	
16900	116.4	15480	106.7	N.L.	N.L.	729	3244	724	3222	N.L.	N.L.	8090	10970	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
10810	74.5	9910	68.3	N.L.	N.L.	567	2521	537	2387	N.L.	N.L.	5720	7760	
10810	74.5	9910	68.3	N.L.	N.L.	538	2395	510	2267	N.L.	N.L.	5610	7610	
12170	83.9	11150	76.8	N.L.	N.L.	567	2521	537	2387	N.L.	N.L.	6170	8370	
12840	88.5	11770	81.1	N.L.	N.L.	595	2647	563	2506	N.L.	N.L.	6500	8810	
14870	102.5	13620	93.8	N.L.	N.L.	708	3151	671	2983	N.L.	N.L.	7600	10310	
16900	116.4	15480	106.7	N.L.	N.L.	765	3403	724	3222	N.L.	N.L.	8490	11510	
5320	36.7	5320	36.7	229	1019	247	1097	329	1465	2290	3110	2470	3340	
5320	36.7	5320	36.7	252	1119	272	1208	402	1789	2520	3410	2720	3680	
7740	53.3	7740	53.3	N.L.	N.L.	348	1546	446	1984	N.L.	N.L.	3480	4710	
7740	53.3	7740	53.3	N.L.	N.L.	338	1504	428	1903	N.L.	N.L.	3410	4630	
8710	60.0	8710	60.0	N.L.	N.L.	356	1583	456	2030	N.L.	N.L.	3750	5090	
9190	63.3	9190	63.3	N.L.	N.L.	374	1662	480	2134	N.L.	N.L.	3960	5360	
10640	73.3	10640	73.3	N.L.	N.L.	445	1979	568	2526	N.L.	N.L.	4620	6270	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
9190	63.3	8990	61.9	N.L.	N.L.	428	1903	524	2331	N.L.	N.L.	4280	5800	
9190	63.3	8990	61.9	N.L.	N.L.	416	1852	503	2236	N.L.	N.L.	4200	5700	
10340	71.2	10120	69.7	N.L.	N.L.	438	1949	536	2384	N.L.	N.L.	4620	6270	
10910	75.2	10680	73.6	N.L.	N.L.	460	2047	563	2506	N.L.	N.L.	4870	6600	
12640	87.1	12360	85.2	N.L.	N.L.	548	2437	667	2967	N.L.	N.L.	5690	7720	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
9880	68.1	8990	61.9	N.L.	N.L.	502	2234	579	2577	N.L.	N.L.	5020	6810	
9880	68.1	8990	61.9	N.L.	N.L.	489	2173	550	2448	N.L.	N.L.	4930	6690	
11110	76.5	10120	69.7	N.L.	N.L.	514	2288	579	2577	N.L.	N.L.	5430	7360	
11730	80.8	10680	73.6	N.L.	N.L.	540	2402	608	2706	N.L.	N.L.	5720	7750	
13580	93.6	12360	85.2	N.L.	N.L.	643	2860	724	3221	N.L.	N.L.	6680	9060	
15430	106.3	14050	96.8	N.L.	N.L.	694	3088	782	3479	N.L.	N.L.	7470	10120	

Values are from API TR 5C3 (1<sup>st</sup> edition) and from API RP 5C1 (18<sup>th</sup> edition)/ Some pipe body yield strengths are higher than the corresponding joint yield strengths.

# APPENDIX

## PERFORMANCE PROPERTIES - CASING ACCORDING API TR 5C3 AND API RP 5C1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		GRADE	PIPE BODY						SC		
inch	mm	ppf	kg/m	inch	mm		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		YIELD STRENGTH		psi	MPa	
							psi	MPa	psi	MPa	1000 lb	kN			
5 1/2	139.7	26.80	39.88	0.500	12.70	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
						K55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
						N80-Q	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
						L80-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
						C90-1	14880	102.5	14320	98.7	707	3144	N.L.	N.L.	
						T95-1	15700	108.2	15110	104.1	746	3319	N.L.	N.L.	
						P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
6 5/8	168.28	24.00	35.72	0.352	8.94	J55	4560	31.4	5110	35.2	382	1697	5110	35.2	
						K55	4560	31.4	5110	35.2	382	1697	5110	35.2	
						N80-Q	5760	39.7	7440	51.3	555	2468	N.L.	N.L.	
						L80-1	5760	39.7	7440	51.3	555	2468	N.L.	N.L.	
						C90-1	6140	42.3	8370	57.7	624	2777	N.L.	N.L.	
						T95-1	6310	43.5	8830	60.8	659	2931	N.L.	N.L.	
						P110	6730	46.4	10230	70.5	763	3394	N.L.	N.L.	
		Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		K55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		N80-Q	8170	56.3	8810	60.7	651	2894	N.L.	N.L.					
		L80-1	8170	56.3	8810	60.7	651	2894	N.L.	N.L.					
		C90-1	8880	61.2	9910	68.3	732	3256	N.L.	N.L.					
		T95-1	9220	63.5	10460	72.1	773	3437	N.L.	N.L.					
		P110	10160	70.0	12120	83.5	895	3979	N.L.	N.L.					
		Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		K55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.				
		N80-Q	10320	71.1	10040	69.2	734	3266	N.L.	N.L.					
		L80-1	10320	71.1	10040	69.2	734	3266	N.L.	N.L.					
		C90-1	11330	78.1	11290	77.8	826	3674	N.L.	N.L.					
T95-1	11820	81.4	11920	82.1	872	3878	N.L.	N.L.							
P110	13220	91.1	13800	95.1	1009	4490	N.L.	N.L.							
Q125-1	14540	100.2	15680	108.0	1147	5102	N.L.	N.L.							
7	177.80	23.00	34.23	0.317	8.05	J55	3270	22-May	4360	30.0	366	1628	4360	30.0	
						K55	3270	22-May	4360	30.0	366	1628	4360	30.0	
						N80-Q	3830	26-Apr	6340	43.7	532	2368	N.L.	N.L.	
						L80-1	3830	26-Apr	6340	43.7	532	2368	N.L.	N.L.	
						C90-1	4030	27-Aug	7130	49.1	599	2665	N.L.	N.L.	
						T95-1	4140	28-May	7530	51.9	632	2813	N.L.	N.L.	
						P110	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
		Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					
		J55	4330	29-Aug	4980	34.3	415	1847	4980	34.3					
		K55	4330	29-Aug	4980	34.3	415	1847	4980	34.3					
		N80-Q	5410	37.3	7240	49.9	604	2686	N.L.	N.L.					
		L80-1	5410	37.7	7240	49.9	604	2686	N.L.	N.L.					
		C90-1	5740	39.5	8150	56.2	679	3022	N.L.	N.L.					
		T95-1	5890	40.6	8600	59.3	717	3190	N.L.	N.L.					
		P110	6230	42.9	9960	68.6	830	3694	N.L.	N.L.					
		Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.					

SC ... Short Round Thread | LC ... Long Round Thread | BC ... Buttress Thread | N.L. ... Not listed in API TR 5C3 (1st Edition) or API RP 5C1 (18th Edition)



THREADED AND COUPLED											MAKE-UP TORQUE (OPT.) ACC. TO API RP 5C1 (+/- 25%)			
INTERNAL YIELD PRESSURE				JOINT STRENGTH							BC		LC	
LC		BC		SC		LC		BC		BC		LC		
psi	MPa	psi	MPa	1000 lb	kN	1000 lb	kN	1000 lb	kN	lbft	Nm	lbft	Nm	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
5110	35.2	5110	35.2	314	1395	340	1514	453	2014	3140	4250	3400	4620	
5110	35.2	5110	35.2	342	1522	372	1656	548	2439	3420	4640	3720	5050	
7440	51.3	7440	51.3	N.L.	N.L.	481	2138	615	2737	N.L.	N.L.	4810	6520	
7440	51.3	7440	51.3	N.L.	N.L.	473	2103	592	2631	N.L.	N.L.	4730	6410	
8370	57.7	8370	57.7	N.L.	N.L.	520	2311	633	2814	N.L.	N.L.	5210	7060	
8830	60.8	8830	60.8	N.L.	N.L.	546	2427	665	2959	N.L.	N.L.	5490	7440	
10230	70.5	10230	70.5	N.L.	N.L.	641	2851	786	3498	N.L.	N.L.	6410	8690	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
8810	60.7	8810	60.7	N.L.	N.L.	586	2605	721	3209	N.L.	N.L.	5860	7940	
8810	60.7	8810	60.7	N.L.	N.L.	576	2562	693	3085	N.L.	N.L.	5760	7810	
9910	68.3	9910	68.3	N.L.	N.L.	633	2817	742	3299	N.L.	N.L.	6350	8610	
10460	72.1	10460	72.1	N.L.	N.L.	665	2958	780	3469	N.L.	N.L.	6690	9070	
12120	83.5	12120	83.5	N.L.	N.L.	781	3475	922	4101	N.L.	N.L.	7810	10590	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
10040	69.2	9820	67.7	N.L.	N.L.	677	3013	814	3621	N.L.	N.L.	6780	9190	
10040	69.2	9820	67.7	N.L.	N.L.	666	2964	783	3481	N.L.	N.L.	6660	9030	
11290	77.8	11050	76.1	N.L.	N.L.	732	3258	837	3723	N.L.	N.L.	7340	9950	
11920	82.1	11660	80.3	N.L.	N.L.	769	3421	880	3914	N.L.	N.L.	7740	10490	
13800	95.1	13500	93.0	N.L.	N.L.	904	4019	1040	4628	N.L.	N.L.	9040	12250	
15680	108.0	15340	105.7	N.L.	N.L.	989	4398	1138	5061	N.L.	N.L.	10110	13710	
4360	30.0	4360	30.0	284	1264	313	1391	432	1922	2840	3850	3130	4240	
4360	30.0	4360	30.0	309	1376	341	1518	522	2320	3090	4190	3410	4630	
6340	43.7	6340	43.7	N.L.	N.L.	442	1965	588	2614	N.L.	N.L.	4420	5990	
6340	43.7	6340	43.7	N.L.	N.L.	435	1934	565	2515	N.L.	N.L.	4350	5890	
7130	49.1	7130	49.1	N.L.	N.L.	479	2132	605	2692	N.L.	N.L.	4790	6500	
7530	51.9	7530	51.9	N.L.	N.L.	505	2247	636	2831	N.L.	N.L.	5050	6850	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
4980	34.3	4980	34.3	334	1486	367	1634	490	2180	3340	4530	3670	4980	
4980	34.3	4980	34.3	364	1617	401	1783	592	2631	3640	4930	4010	5440	
7240	49.9	7240	49.9	N.L.	N.L.	519	2309	667	2965	N.L.	N.L.	5190	7040	
7240	49.9	7240	49.9	N.L.	N.L.	511	2272	641	2852	N.L.	N.L.	5110	6930	
8150	56.2	8150	56.2	N.L.	N.L.	563	2505	687	3054	N.L.	N.L.	5630	7630	
8600	59.3	8600	59.3	N.L.	N.L.	593	2640	722	3211	N.L.	N.L.	5930	8050	
9960	68.6	9960	68.6	N.L.	N.L.	693	3082	853	3795	N.L.	N.L.	6930	9390	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	

Values are from API TR 5C3 (1<sup>st</sup> edition) and from API RP 5C1 (18<sup>th</sup> edition)/ Some pipe body yield strengths are higher than the corresponding joint yield strengths.

# APPENDIX

## PERFORMANCE PROPERTIES - CASING ACCORDING API TR 5C3 AND API RP 5C1

OUTSIDE DIAMETER		WEIGHT		WALL THICKNESS		GRADE	PIPE BODY								
inch	mm	ppf	kg/m	inch	mm		COLLAPSE RESISTANCE		INTERNAL YIELD PRESSURE		YIELD STRENGTH		SC		
						psi	MPa	psi	MPa	1000 lb	kN	psi	MPa		
7	177.80	29.00	43.16	0.408	10.36	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
						K55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
						N80-Q	7030	48.4	8160	56.2	676	3006	N.L.	N.L.	
						L80-1	7030	48.4	8160	56.2	676	3006	N.L.	N.L.	
						C90-1	7580	52.2	9180	63.3	760	3382	N.L.	N.L.	
						T95-1	7840	54.0	9690	66.8	803	3570	N.L.	N.L.	
						P110	8530	58.8	11220	77.3	929	4134	N.L.	N.L.	
						Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
		32.00	47.62	0.453	11.51	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
						K55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
						N80-Q	8600	59.3	9060	62.4	745	3315	N.L.	N.L.	
						L80-1	8600	59.3	9060	62.4	745	3315	N.L.	N.L.	
						C90-1	9380	64.6	10190	70.2	839	3730	N.L.	N.L.	
						T95-1	9740	67.1	10760	74.1	885	3937	N.L.	N.L.	
						P110	10780	74.3	12460	85.8	1025	4559	N.L.	N.L.	
						Q125-1	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
		35.00	52.09	0.498	12.65	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
						K55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
						N80-Q	10180	70.1	9960	68.6	814	3620	N.L.	N.L.	
						L80-1	10180	70.1	9960	68.6	814	3620	N.L.	N.L.	
						C90-1	11170	77.0	11240	77.2	915	4072	N.L.	N.L.	
						T95-1	11650	80.3	11830	81.5	966	4298	N.L.	N.L.	
						P110	13030	89.8	13700	94.4	1119	4977	N.L.	N.L.	
						Q125-1	14310	98.6	15560	107.2	1272	5656	N.L.	N.L.	
		38.00	56.55	0.540	13.72	J55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.
						K55	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
						N80-Q	11390	78.5	10800	74.4	877	3900	N.L.	N.L.	
						L80-1	11390	78.5	10800	74.4	877	3900	N.L.	N.L.	
C90-1	12810					88.3	12150	83.7	986	4387	N.L.	N.L.			
T95-1	13430					92.5	12830	88.4	1041	4631	N.L.	N.L.			
P110	15130					104.2	14850	102.3	1205	5362	N.L.	N.L.			
Q125-1	16740					115.3	16880	116.3	1370	6093	N.L.	N.L.			

SC ... Short Round Thread | LC ... Long Round Thread | BC ... Buttress Thread | N.L. ... Not listed in API TR 5C3 (1st Edition) or API RP 5C1 (18th Edition)

THREADED AND COUPLED											MAKE-UP TORQUE (OPT.) ACC. TO API RP 5C1 (+/- 25%)			
INTERNAL YIELD PRESSURE				JOINT STRENGTH						BC		LC		
LC		BC		SC		LC		BC		lbft	Nm	lbft	Nm	
psi	MPa	psi	MPa	1000 lb	kN	1000 lb	kN	1000 lb	kN	lbft	Nm	lbft	Nm	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
8160	56.2	8160	56.2	N.L.	N.L.	597	2656	746	3319	N.L.	N.L.	5970	8100	
8160	56.2	8160	56.2	N.L.	N.L.	587	2613	718	3192	N.L.	N.L.	5870	7960	
9180	63.3	9180	63.3	N.L.	N.L.	648	2881	768	3418	N.L.	N.L.	6480	8780	
9690	66.8	9690	66.8	N.L.	N.L.	683	3036	808	3593	N.L.	N.L.	6830	9250	
11220	77.3	11220	77.3	N.L.	N.L.	797	3545	955	4247	N.L.	N.L.	7970	10800	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
9060	62.4	8460	58.3	N.L.	N.L.	672	2990	823	3660	N.L.	N.L.	6720	9110	
9060	62.4	8460	58.3	N.L.	N.L.	661	2941	791	3520	N.L.	N.L.	6610	8970	
10190	70.2	9520	65.6	N.L.	N.L.	729	3243	847	3769	N.L.	N.L.	7290	9890	
10760	74.1	10050	69.2	N.L.	N.L.	768	3418	891	3963	N.L.	N.L.	7680	10420	
12460	85.8	11640	80.2	N.L.	N.L.	897	3990	1053	4684	N.L.	N.L.	8970	12160	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
9240	63.7	8460	58.3	N.L.	N.L.	746	3319	876	3899	N.L.	N.L.	7460	10120	
9240	63.7	8460	58.3	N.L.	N.L.	734	3266	833	3704	N.L.	N.L.	7340	9950	
10390	71.6	9520	65.6	N.L.	N.L.	809	3600	876	3899	N.L.	N.L.	8090	10970	
10970	75.6	10050	69.2	N.L.	N.L.	853	3794	920	4093	N.L.	N.L.	8530	11560	
12700	87.5	11640	80.2	N.L.	N.L.	996	4430	1096	4873	N.L.	N.L.	9960	13500	
14430	99.4	13220	91.1	N.L.	N.L.	1106	4918	1183	5263	N.L.	N.L.	11150	15110	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	N.L.	
9240	63.7	8460	58.3	N.L.	N.L.	814	3622	876	3899	N.L.	N.L.	8140	11040	
9240	63.7	8460	58.3	N.L.	N.L.	801	3563	833	3704	N.L.	N.L.	8010	10860	
10390	71.6	9520	65.6	N.L.	N.L.	883	3928	876	3899	N.L.	N.L.	8830	11970	
10970	75.6	10050	69.2	N.L.	N.L.	931	4140	920	4093	N.L.	N.L.	9310	12620	
12700	87.5	11640	80.2	N.L.	N.L.	1087	4834	1096	4873	N.L.	N.L.	10870	14730	
14430	99.4	13220	91.1	N.L.	N.L.	1207	5367	1183	5263	N.L.	N.L.	12160	16490	

Values are from API TR 5C3 (1<sup>st</sup> edition) and from API RP 5C1 (18<sup>th</sup> edition)/ Some pipe body yield strengths are higher than the corresponding joint yield strengths.

**voestalpine Tubulars GmbH & Co KG**

Alpinestrasse 17

8652 Kindberg-Aumuehl, Austria

T. +43/50304/23-0

F. +43/50304/63-532

[sales@vatubulars.com](mailto:sales@vatubulars.com)

[www.voestalpine.com/tubulars](http://www.voestalpine.com/tubulars)

**voestalpine**

ONE STEP AHEAD.