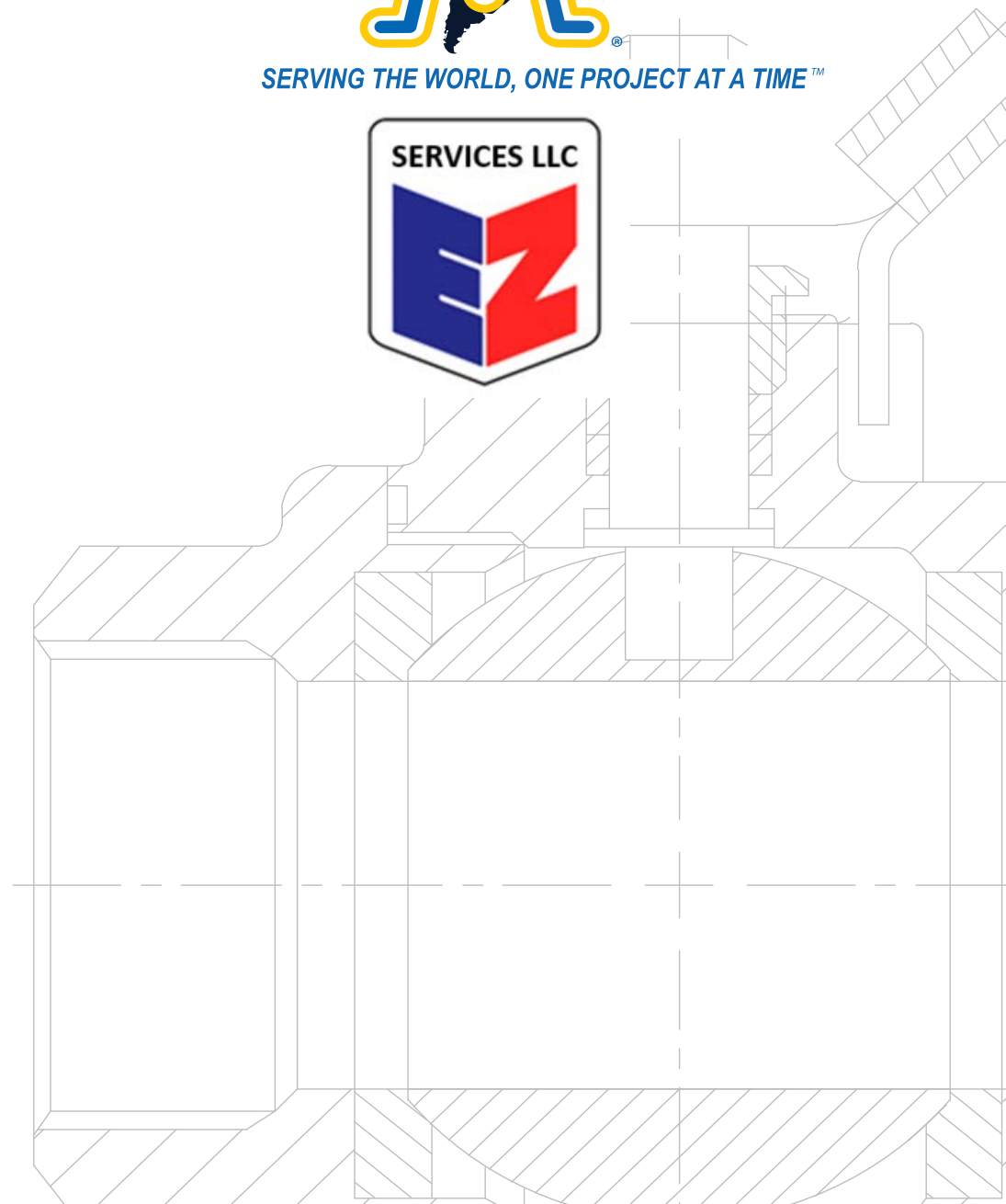




SERVING THE WORLD, ONE PROJECT AT A TIME™



API 5CT/ISO 11960 TUBING & CASING

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All tubing supplied under MORRIS VAVES® brand, meet or exceed the API requirements and testing procedures (see API Spec. 5CT).

For all applications and for critical wells, always delivery the MTC including the manufacturer's test results.

For tubing used in sour wells (wells with H₂S content greater than 0.05 psi partial pressure), specific sour service requirements are reviewed and applied in the manufacturing process.

Tubing connectors and joints.

The API external-upset-end (EUE) tubing connection is widely used because it is a good, serviceable connection in most wells.

The EUE joint has a designed joint strength in tension and pressure strength greater than that of the pipe body and, therefore, is considered a 100% joint efficient connection. For proper lubrication and sealing, the joint requires a good thread compound as outlined in API RP 5A3. [2] To improve the seal performance of API EUE tubing in high-pressure service, a grooved coupling, which accepts nonmetallic seal rings, is sometimes used in the coupling (see API Spec. 5CT SR 13).

To provide more clearance, API special clearance EUE couplings are available. API EUE joints come in OD sizes of 1.050 to 4.500 in.

API non-upset (NUE) tubing is used much less than EUE tubing. The cost of NUE is only slightly less than EUE, and the joint strength is substantially less. The coupling joint diameter of NUE is less than EUE, which offers some advantages when clearance is small.

API NUE joints are available in sizes of 1.050 to 4.500 in.

API integral-joint tubing is available in OD sizes of 1.315 to 2.063 in. API integral-joint tubing has a 10-round form with a joint strength that is less than the body minimum yield, which restricts its use. The small OD of integral-joint tubing permits its use inside larger tubing strings or in wells as unloading or vent strings.

The couplings should meet all the minimum requirements outlined in API Spec. 5CT. [1] API Spec. 5B3 and API RP 5B14 cover threading, gauging, and thread inspection.

Several proprietary (non-API) connections are available. These joints are useful when greater leak resistance or more clearance is needed than that provided by the standard API joints.





1	LABELS			O.D (in)	WALL THICKNESS (in)	WEIGHT (Lb. / Ft)			TYPE END FINISH								
	2		IJ			NU T&C	EU T&C	IJ	H40	J55	L80	N80			C90d	T95d	P110
	NU T&C	EU T&C										TYPE1, Q	TYPE1, Q	TYPE1, Q			
2-3/8	2	3	4	5	9	6	7	8	10	11	12	13	14	15	16		
	4.00	-	-	2.375	0.167	4.00	-	-	PN	PN	PN	PN	PN	PN	-		
	4.60	4.70	-	2.375	0.190	4.60	4.70	-	PNU	PNU	PNU	PNU	PNU	PNU	PNU		
	5.80	5.95	-	2.375	0.254	5.80	5.95	-	-	-	PNU	PNU	PNU	PNU	PNU		
	6.60	-	-	2.375	0.295	6.60	-	-	-	-	P	-	P	P	-		
	7.35	7.45	-	2.375	0.336	7.35	7.45	-	-	-	PU	-	PU	PU	-		
2-7/8	6.40	6.50	-	2.875	0.217	6.40	6.50	-	PNU	PNU	PNU	PNU	PNU	PNU	PNU		
	7.80	7.90	-	2.875	0.276	7.80	7.90	-	-	-	PNU	PNU	PNU	PNU	PNU		
	8.60	8.70	-	2.875	0.308	8.60	8.70	-	-	-	PNU	PNU	PNU	PNU	PNU		
	9.35	9.45	-	2.875	0.340	9.35	9.45	-	-	-	PU	-	PU	PU	-		
	10.50	-	-	2.875	0.392	10.50	-	-	-	-	P	-	P	P	-		
	11.50	-	-	2.875	0.440	11.50	-	-	-	-	P	-	P	P	-		
3-1/2	7.70	-	-	3.500	0.216	7.70	-	-	PN	PN	PN	PN	PN	PN	-		
	9.20	9.30	-	3.500	0.254	9.20	9.30	-	PNU	PNU	PNU	PNU	PNU	PNU	PNU		
	10.20	-	-	3.500	0.289	10.20	-	-	PN	PN	PN	PN	PN	PN	-		
	12.70	12.95	-	3.500	0.375	12.70	12.95	-	-	-	PNU	PNU	PNU	PNU	PNU		
	14.30	-	-	3.500	0.430	14.30	-	-	-	-	P	-	P	P	-		
	15.50	-	-	3.500	0.476	15.50	-	-	-	-	P	-	P	P	-		
4	17.00	-	-	3.500	0.530	17.00	-	-	-	-	P	-	P	P	-		
	9.50	-	-	4.000	0.226	9.50	-	-	PN	PN	PN	PN	PN	PN	-		
	10.70	11.00	-	4.000	0.262	10.70	-	-	PU	PU	PU	PU	PU	PU	-		
	13.20	-	-	4.000	0.330	13.20	-	-	-	-	P	-	P	P	-		
	16.10	-	-	4.000	0.415	16.10	-	-	-	-	P	-	P	P	-		
	18.90	-	-	4.000	0.500	18.90	-	-	-	-	P	-	P	P	-		
4-1/2	22.20	-	-	4.000	0.610	22.20	-	-	-	-	P	-	P	P	-		
	12.60	12.75	-	4.500	0.271	12.60	12.75	-	PNU	PNU	PNU	PNU	PNU	PNU	-		
	15.20	-	-	4.500	0.337	15.20	-	-	-	-	P	-	P	P	-		
	17.00	-	-	4.500	0.380	17.00	-	-	-	-	P	-	P	P	-		
	18.90	-	-	4.500	0.430	18.90	-	-	-	-	P	-	P	P	-		
	21.50	-	-	4.500	0.500	21.50	-	-	-	-	P	-	P	P	-		
4-1/2	23.70	-	-	4.500	0.560	23.70	-	-	-	-	P	-	P	P	-		
	26.10	-	-	4.500	0.630	26.10	-	-	-	-	P	-	P	P	-		

This International Standard is applicable to the following connections in accordance with API Spec 5B: * Short round thread casing. MARKED SYMBOL (STC)

* Long round thread casing. MARKED SYMBOL (LC)

* Buttress thread casing. MARKED SYMBOL (BC)

* Extreme-line casing. MARKED SYMBOL (XC)

* Non-upset tubing. MARKED SYMBOL (NU)

* External upset tubing. MARKED SYMBOL (EU)

* Integral joint tubing. MARKED SYMBOL (IJ)

1. Nominal linear masses, threads and coupling (col 2,3,4) are shown for information only.
2. The densities of martensitic chromium Steels (L80 types 9Cr and 13Cr) are different from carbon steels.
3. The masses shown are therefore not accurate for martensitic chromium steels. A mass correction factor of 0,989 may be used.
4. Non-upset tubing is available with regular couplings or special bevel couplings. External- upset tubing is available with regular, special-level, or special-clearance couplings.
5. Grade C90 and T95 tubing shall be furnished in sizes, masses and wall thickness as listed above, or as shown on the purchase agreement.



API 5CT TUBING																
Chemical and Mechanical Properties																
STD	Grade		Chemical Requirements (Composition %)										Mechanical Requirements			
			C	Mn	P	S	Si	Cr	Ni	Cu	Mo	V	Yield strength Min (Ksi)	Tensile strength Min (Ksi)	Elongation Min (%)	Hardness
API 5CT	J55K55	Min	0.34	1.25	≤0.020	≤0.015	0.20	≤0.15	≤0.20	≤0.20	-	-	75-55	> 55		
	(37Mn5)	Max	0.39	1.50	≤0.020	≤0.015	0.35	≤0.15	≤0.20	≤0.20	-	-	<80	> 55		
	N80	Min	0.34	1.45	≤0.020	≤0.015	0.20	≤0.15	-	-	-	0.11	110 - 80	>100		
	(36 Mn2V)	Max	0.38	1.70	≤0.020	≤0.015	0.35	≤0.15	-	-	-	0.16	110 - 80	>100		
	L80	Min	0.15	0.25	≤0.020	≤0.010	≤1.00	12.0	≤0.20	≤0.20	-	-	80 - 95	> 95		
	(13Cr)	Max	0.22	1.00	≤0.020	≤0.010	≤1.00	14.0	≤0.20	≤0.20	-	-	80 - 95	> 95		
	P110	Min	0.26	0.40	≤0.020	≤0.010	0.17	0.80	≤0.20	≤0.20	0.15	≤0.08	110-140	> 125		
	(30CrMo)	Max	0.35	0.70	≤0.020	≤0.010	0.37	1.10	≤0.20	≤0.20	0.25	-	110-140	> 125		
H40		0.23	0.30	0.030	0.030	0.45	2.8	0.4	-	-	-	-	-			

Mill Test Certificates: Issued in accordance with API Specification 5CT Eighth Edition. Additional Third Party Inspection can also be performed on request.

Warranty: 12 MONTHS FROM DATE OF COMMISSIONING OR 18 MONTHS FROM SHIPMENT DATE.

Packing: By Bundles

Marking: Per API 5CT



Casing. -

Is the major structural component of a well. Casing is needed to:

- * Maintain borehole stability
- * Prevent contamination of water sands
- * Isolate water from producing formations
- * Control well pressures during drilling, production, and workover operations

Casing provides locations for the installation of:

- * Blowout preventers
- * Wellhead equipment
- * Production packers
- * Production tubing

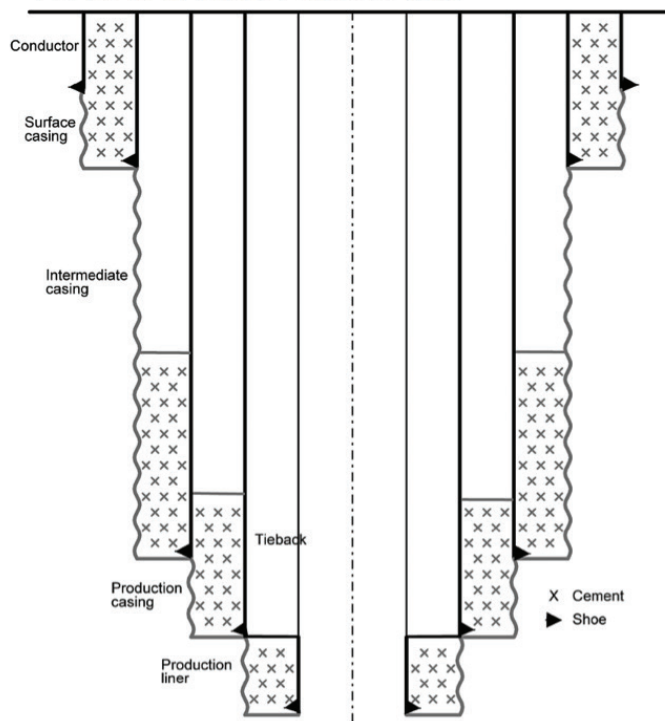
The cost of casing is a major part of the overall well cost, so selection of casing size, grade, connectors, and setting depth is a primary engineering and economic consideration.

Casing strings

There are six basic types of casing strings:

- * Conductor Casing
- * Surface Casing
- * Intermediate Casing
- * Production Casing
- * Liner
- * Liner tieback casing

TYPICAL CASING PROGRAMM



API 5CT CASING SPECIFICATIONS.												
SIZE	WEIGHT Lb/ft	O. D (In)	WALL THICKNESS (In)	TYPE END FINISH GRADE								
				H40	J-55	K-55	M-65	L-80	C-95	N-80	C-90	T-95
4-1/2"	9.50	4.500	0.205	PS	PS	PS	-	-	-	-	-	-
	10.50		0.224	-	PSB	PSB	-	-	-	-	-	-
	11.60		0.250	-	PSLB	PLB	PLB	PLB	PLB	PLB	PLB	-
	13.50		0.290	-	-	PLB	PLB	PLB	PLB	PLB	PLB	-
	15.10		0.337	-	-	-	-	-	-	-	PLB	PLB
5	11.50	5.000	0.220	-	PS	PS	-	-	-	-	-	-
	13.00		0.253	-	PSLB	PSLB	-	-	PLBE	-	-	-
	15.00		0.296	-	PSLB	PLB	PLB	PLB	PLBE	PLB	-	-
	18.00		0.362	-	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	21.40		0.437	-	-	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	23.20		0.478	-	-	-	-	-	-	PLB	-	PLB
	24.10		0.500	-	-	-	-	-	-	-	-	PLB
5-1/2	14.00	5.500	0.244	PS	PS	PS	-	-	-	-	-	-
	15.50		0.275	-	PSLB	PSLB	-	-	-	-	-	-
	17.00		0.304	-	PSLB	PLB	PLB	PLB	PLBE	PLB	-	-
	20.00		0.361	-	-	PLB	PLB	PLB	PLBE	PLB	-	-
	23.00		0.415	-	-	PLB	PLB	PLB	PLBE	PLB	PLB	
	26.80		0.500	-	-	-	-	-	P	-	-	-
	29.70		0.562	-	-	-	-	-	P	-	-	-
	32.60		0.625	-	-	-	-	-	P	-	-	-
	35.30		0.687	-	-	-	-	-	P	-	-	-
	38.00		0.750	-	-	-	-	-	P	-	-	-
	40.50		0.812	-	-	-	-	-	P	-	-	-
	43.10		0.875	-	-	-	-	-	P	-	-	-
6 5/8	20.00	6.625	0.288	PS	PSLB	PSLB	-	-	-	-	-	-
	24.00		0.352	-	PSLB	PLB	PLB	PLB	PLBE	PLB	-	
	28.00		0.417	-	-	PLB	PLB	PLB	PLBE	PLB	-	
	32.00		0.475	-	-	-	PLB	PLB	PLBE	PLB	PLB	
7	17.00	7.000	0.231	PS	-	-	-	-	-	-	-	-
	20.00		0.272	PS	PS	PS	-	-	-	-	-	-
	23.00		0.317	-	PSLB	PLB	PLB	PLB	PLBE	-	-	-
	26.00		0.362	-	PSLB	PLB	PLB	PLB	PLBE	PLB	-	-
	29.00		0.408	-	-	PLB	PLB	PLB	PLBE	PLB	-	-
	32.00		0.453	-	-	PLB	PLB	PLB	PLBE	PLB	-	-
	35.00		0.498	-	-	-	PLB	PLB	PLBE	PLB	PLB	PLB
	38.00		0.540	-	-	-	PLB	PLB	PLBE	PLB	PLB	PLB
	42.70		0.625	-	-	-	P	-	-	-	-	-
	46.40		0.687	-	-	-	P	-	-	-	-	-
	50.10		0.750	-	-	-	P	-	-	-	-	-
	53.60		0.812	-	-	-	P	-	-	-	-	-
	57.10		0.875	-	-	-	P	-	-	-	-	-

P= PLAIN ENDS S = SHORT ROUND THREAD L = LONG RND THREAD B = BUTTERS THREAD

This International Standard is applicable to the following connections in accordance with API Spec 5B:

- * Short round thread casing. MARKED SYMBOL (STC)
- * Long round thread casing. MARKED SYMBOL (LC)
- * Buttress thread casing. MARKED SYMBOL (BC)
- * Extreme-line casing. MARKED SYMBOL (XC)
- * Non-upset tubing. MARKED SYMBOL (NU)
- * External upset tubing. MARKED SYMBOL (EU)
- * Integral joint tubing. MARKED SYMBOL (IJ)

1. Nominal linear masses, threads and coupling (col 2,3,4) are shown for information only.
2. The densities of martensitic chromium Steels (L80 types 9Cr and 13Cr) are different from carbon steels.
3. The masses shown are therefore not accurate for martensitic chromium steels. A mass correction factor of 0,989 may be used.
4. Non-upset tubing is available with regular couplings or special bevel couplings. External- upset tubing is available with regular, special-level, or special-clearance couplings.
5. Grade C90 and T95 tubing shall be furnished in sizes, masses and wall thickness as listed above, or as shown on the purchase agreement.



API SCT CASING SPECIFICATIONS.												
SIZE	WEIGHT Lb/ft	O. D (In)	WALL THICKNESS (In)	TYPE END FINISH								
				GRADE								
				H40	J-55	K-55	M-65	L-80	C-95	N-80	C-90	T-95
7 5/8"	24.00	7.625	0.300	PS	--	--	--	--	--	--	--	--
	26.40	7.625	0.328	--	PSLB	PSLB	PLB	PLB	PLB	PLB	PLB	--
	29.70	7.625	0.375	--	--	PLB	PLB	PLB	PLB	PLB	PLB	--
	33.70	7.625	0.430	--	--	PLB	PLB	PLB	PLB	PLB	PLB	--
	39.00	7.625	0.500	--	--	--	PLB	PLB	PLB	PLB	PLB	PLB
	42.80	7.625	0.562	--	--	--	PLB	PLB	PLB	PLB	PLB	PLB
	45.30	7.625	0.595	--	--	--	PLB	PLB	PLB	PLB	PLB	PLB
	47.10	7.625	0.625	--	--	--	PLB	PLB	PLB	PLB	PLB	PLB
	51.20	7.625	0.687	--	--	--	--	--	P	--	--	--
55.30	7.750	196.85	--	--	--	--	--	P	--	--	--	
7 3/4"	46.10	8.625	0.595	--	--	--	P	P	P	P	P	P
8 5/8"	24.00	8.625	0.264	--	PS	PS	--	--	--	--	--	--
	28.00	8.625	0.304	PS	--	PS	--	--	--	--	--	--
	32.00	8.625	0.352	PS	PSLB	PSLB	--	--	--	--	--	--
	36.00	8.625	0.400	--	PSLB	PSLB	PLB	PLB	PLB	PLB	PSLB	--
	40.00	8.625	0.450	--	--	PLB	PLB	PLB	PLB	PLB	PLB	--
	44.00	8.625	0.500	--	--	PLB	PLB	PLB	PLB	PLB	PLB	--
	49.00	9.625	0.557	--	--	--	PLB	PLB	PLB	PLB	PLB	PLB
9 5/8"	32.30	9.625	0.312	PS	--	--	--	--	--	--	--	--
	36.00	9.625	0.352	PS	PSLB	PSLB	--	--	--	--	--	--
	40.00	9.625	0.395	--	PSLB	PSLB	PLB	PLB	PLB	PLB	--	--
	43.50	9.625	0.435	--	--	PLB	PLB	PLB	PLB	PLB	PLB	--
	47.00	9.625	0.472	--	--	PLB	PLB	PLB	PLB	PLB	PLB	PLB
	53.50	9.625	0.545	--	--	--	PLB	PLB	PLB	PLB	PLB	PLB
	58.40	9.625	0.595	--	--	--	PLB	PLB	PLB	PLB	PLB	PLB
	59.40	9.625	0.609	--	--	--	--	--	P	--	--	--
	64.90	9.625	0.672	--	--	--	--	--	P	--	--	--
	70.30	9.625	0.300	H-40	J-55	K-55	M-65	L-80C-95	N-80	C-90T-95	P-110	Q-125
75.60	9.625	0.328	PS	--	--	--	--	--	--	--	--	
10 3/4"	32.75	10.75	0.279	PS	--	--	--	--	--	--	--	--
	40.50	10.75	0.350	PS	PSB	PSB	--	--	--	--	--	--
	45.50	10.75	0.400	--	PSB	PSB	--	--	--	--	--	--
	51.00	10.75	0.450	--	PSB	PSB	PSB	PSB	PSB	PSB	PSB	--
	55.50	10.75	0.495	--	--	PSB	PSB	PSB	PSB	PSB	PSB	--
	60.70	10.75	0.545	--	--	--	--	--	PSB	PSB	PSB	PSB
	65.70	10.75	0.595	--	--	--	--	--	PSB	PSB	PSB	PSB
	73.20	10.75	0.672	--	--	--	--	--	P	--	--	--
	79.20	10.75	0.734	--	--	--	--	--	P	--	--	--
11 3/4"	42.00	11.75	0.333	PS	--	--	--	--	--	--	--	--
	47.00	11.75	0.375	--	PSB	PSB	--	--	--	--	--	--
	54.00	11.75	0.435	--	PSB	PSB	--	--	--	--	--	--
	60.00	11.75	0.489	--	PSB	PSB	PSB	PSB	PSB	PSB	PSB	PSB
	65.00	11.75	0.534	--	--	--	P	P	P	P	P	P
	71.00	11.75	0.582	--	--	--	P	P	P	P	P	P
13 3/8"	48.00	13.375	0.330	PS	--	--	--	--	--	--	--	--
	54.50	13.375	0.380	--	PSB	PSB	--	--	--	--	--	--
	61.00	13.375	0.430	--	PSB	PSB	--	--	--	--	--	--
	68.00	13.375	0.480	--	PSB	PSB	PSB	PSB	PSB	PSB	PSB	--
	72.00	13.375	0.514	--	--	--	PSB	PSB	PSB	PSB	PSB	PSB
16	65.00	16.000	0.375	PS	-	-	-	-	-	-	-	-
	75.00	16.000	0.438	-	PSB	PSB	-	-	-	-	-	-
	84.00		0.495	-	PSB	PSB	-	-	-	-	-	-
	109.00		0.656	-	P	-	P	P	P	P	P	P
18-5/8"	87.50	18.625	0.435	PS	PSB	PSB	-	-	-	-	-	-
	94.00		0.438	PSL	PSLB	PSLB	-	-	-	-	-	-
20	106.50	20.00	0.500	-	PSLB	PSLB	-	-	-	-	-	-
	133.00		0.635	-	PSLB	-	-	-	-	-	-	-

P= PLAIN ENDS S = SHORT ROUND THREAD L = LONG RND THREAD B = BUTTERS THREAD

This International Standard is applicable to the following connections in accordance with API Spec 5B:

- * Short round thread casing. MARKED SYMBOL (STC)
- * Long round thread casing. MARKED SYMBOL (LTC)
- * Buttress thread casing. MARKED SYMBOL (BTC)
- * Extreme-line casing. MARKED SYMBOL (XC)





A Tradition of Quality

Our passion is to develop solutions for difficult situations in Industrial Applications, no matter how large or small the project.

"Serving the world, one project at a time"

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