

INTERNATIONAL STANDARD

ISO
10405

First edition
1993-08-01

Petroleum and natural gas industries – Care and use of casing and tubing

*Industries du pétrole et du gaz naturel – Entretien et utilisation des tubes de
cuvelage et de production*

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ISO 10405:1993

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Reference number
ISO 10405:1993(E)

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 10405 was prepared by the American Petroleum Institute (API) (as RP 5C1) and was adopted, under a special "fast-track procedure", by Technical Committee ISO/TC 67, *Materials and equipment for petroleum and natural gas industries*, in parallel with its approval by the ISO member bodies.

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Introduction

International Standard ISO 10405:1993 reproduces the content of API RP 5C1, 16th edition, 1988. ISO, in endorsing this API document, recognizes that in certain respects the latter does not comply with all current ISO rules on the presentation and content of an International Standard. Therefore, the relevant technical body, within ISO/TC 67, will review ISO 10405:1993 and reissue it, when practicable, in a form complying with these rules.

This International Standard is not intended to obviate the need for sound engineering judgement as to when and where this International Standard should be utilized and users should be aware that additional or differing requirements may be needed to meet the needs for the particular service intended.

Standards referenced herein may be replaced by other international or national standards that can be shown to meet or exceed the requirements of the referenced standards.

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Petroleum and natural gas industries – Care and use of casing and tubing

1 Scope

This International Standard contains guiding principles for care and use of casing and tubing for the petroleum and natural gas industries.

2 Requirements

Requirements are specified in:

“API Recommended Practice 5C1 (RP 5C1), Sixteenth Edition, May 31, 1988, *Recommended Practice for Care and Use of Casing and Tubing*”,

which is adopted as ISO 10405.

For the purposes of international standardization, however, modifications shall apply to specific clauses and paragraphs of API RP 5C1. These modifications are outlined below.

NOTE – A wavy line in the margin indicates the location of a modification to the text of the API publication.

Page 3

Information given in the POLICY statement is relevant to the API publication only.

Page 6

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Subclause 1.1, item b

Second line: delete “API” before “tubular goods”.

Subclause 1.7, item c

Second sentence shall read: “A steel tape calibrated in millimetres should be used.”

Page 7

Subclause 1.13

17th line from bottom shall read: “All values are rounded to the nearest 10 N·m.”

6th line from bottom: Delete the asterisk after the parenthesis and the corresponding footnote.

Subclause 1.14

Subheading above item a shall read: “**Round thread, 114 mm through 340 mm OD**”

Subheading above item g shall read: “**Buttress thread, 114 mm through 340 mm OD**”

Item g, 2nd line shall read: “... sizes 114,3 mm through 339,7 mm OD...”

Page 8

Subheading on 1st line shall read: “**Round thread and buttress thread, 406 mm, 473 mm and 508 mm OD**”

Item h, 1st line shall read:

“Make-up of 406,4 mm, 473 mm and 508 mm OD shall be to a...”

Item h, second paragraph, first sentence shall read:

“On 8-round thread casing a 9,5 mm equilateral triangle is die stamped at a distance of $L_1 + 1,6$ mm from each end.”

Item h, third paragraph, 4th line shall read: “(67 800 N·m)”

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Subclause 1.15

Second sentence shall read:

"The joint should be made up beyond the hand-tight position at least three turns for sizes 114,3 mm through 177,8 mm and at least three and a half turns for sizes 193,7 mm and larger, except 244,5 mm and 273,1 mm grade P-110 and 508 mm grade J-55 and K-55 which should be made up for turns beyond hand-tight position."

Page 9

Subclause 1.28

Delete the first sentence starting "When thorough..." and ending "... Dallas, Texas."

Pages 11 to 18, inclusive

Replace part of the existing tables by new table 1.1 and table 1.2.

Page 19

Subclause 2.1, item b

2nd line: Delete "API" before "tubular goods".

Subclause 2.3

2nd line: Delete "API" before "drift mandrel".

Subclause 2.9, item c

Second sentence shall read: "A steel tape calibrated in millimetres should be used."

Page 20

Subclause 2.15

Last line shall read: "... coupling is made up with a torque of 68 N·m."

Subclause 2.16

13th line from bottom shall read: "All values are rounded to the nearest 10 N·m."

6th and 3rd lines from bottom: Delete the asterisk after the parenthesis (twice), and the corresponding footnote.

Subclause 2.24

Second sentence shall read:

"Tubing 60 mm OD and larger, preferably should be pulled in stands approximately 18 300 mm long or in doubles of range 2. Stands of tubing 48,3 mm OD or smaller and stands longer than 18 300 mm, should have intermediate support."

Page 21

Subclause 2.33

Delete the third sentence starting "When thorough..." and ending "... Dallas, Texas."

Pages 22 to 24, inclusive

Replace the existing table by new table 2.1.

Page 25

Subclause 3.1

1st line: Delete "API" before "tubular goods".

Subclause 3.3

2nd line: Delete the words "..., in addition to I.C.C. requirement, ..."

Subclause 3.6, item a

3rd line shall read: "less than 500 mm from the ground."

Subclause 3.6, item g

3rd line shall read: "higher than 3 000 mm."

Page 26

Subclause 4.4

2nd line below table 4.1: Delete "API" before "specified pipe wall thickness".

Page 27

Subclause 6.3

1st line: Substitute "should" for "shall".

Subclause 6.5

3rd and 7th lines: Substitute "should" for "shall".

Page 28

Subclause 6.10

3rd line: Replace "1 200 F" by "650 °C".

Subclause 6.11

Replace the present wording with the following:

"When using the metal arc process, low hydrogen electrodes should be used. These include all electrodes with the AWS classifications Exx15, Exx16, and Exx18 in AWS Specification A5.1, "Covered Carbon Steel Arc Welding Electrodes" (latest edition*). Low-hydrogen electrodes should not be exposed to the atmosphere until ready for use. Electrodes must be stored in holding ovens at 65 °C to 150 °C immediately after their containers have been opened. Once removed from the holding oven, electrodes must be used within 30 min. Electrodes not used within this time limit must be discarded or re-conditioned by baking at 315 °C to 370 °C for 1 h. After re-conditioning, electrodes must be placed into the holding oven."

Subclause 6.13

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2nd line: Replace "3 in" by "75 mm".

3rd line: Replace "400 to 600 F" by "205 °C to 315 °C".

Subclause 6.14

3rd line from bottom: Replace "205 F" by "121 °C".

Subclause 6.16

2nd line shall read: "4,8 mm diameter or smaller should be used."

Subclause 6.22

Second sentence shall read:

"If the top side of the float collar and casing collars are welded while the casing is in the rotary or if the practice is not to make a complete weld, three 75 mm welds should be placed at 120° intervals around 244,5 mm casing, three 100 mm welds should be placed on larger casing, and three 50 mm welds on smaller casings."

Subclause 6.23

1st line shall read: "If welds longer than 100 mm to 150 mm are made,"

2nd line shall read: "For example: If 150 mm..."

5th line shall read: "...150 mm to the left of the weld..."

Subclause 6.26

2nd line shall read: "... welds should be a minimum length of 50 mm at 50 mm intervals."

Subclause 6.27

End of 2nd line shall read: "..., with 19 mm welds at two equal spacings on the front edge and on 19 mm weld ..."

New tables

1.1 Recommended casing make-up torque 8-round-thread casing

1.2 Torque values for extremeline casing

2.1 Recommended tubing make-up torque round thread tubing

NOTE – In tables 1.1 and 2.1, the values expressed in pounds per foot (column 2) must be multiplied by 1,488 to determine the linear density ρ_r .

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TABLE 1.1
RECOMMENDED CASING MAKE-UP TORQUE
8-ROUND-THREAD CASING

1		2	2	4	5	6		7		
Size Outside Diameter		Nominal Weight, Threads and Coupling lbs/ft	Grade	Thread	Torque, ft-lbs (N·m)					
in.	(mm)				Optimum	Minimum		Maximum		
4.500	(114,3)	9.50	H-40	ST&C	770	(1040)	570	(780)	960	(1300)
4.500	(114,3)	9.50	J-55	ST&C	1010	(1380)	760	(1030)	1270	(1720)
4.500	(114,3)	10.50	J-55	ST&C	1320	(1790)	990	(1350)	1650	(2240)
4.500	(114,3)	11.60	J-55	ST&C	1540	(2090)	1150	(1560)	1920	(2610)
4.500	(114,3)	9.50	K-55	ST&C	1120	(1520)	840	(1140)	1400	(1900)
4.500	(114,3)	10.50	K-55	ST&C	1460	(1980)	1100	(1490)	1830	(2480)
4.500	(114,3)	11.60	K-55	ST&C	1700	(2310)	1280	(1730)	2130	(2890)
4.500	(114,3)	11.60	J-55	LT&C	1620	(2200)	1210	(1650)	2020	(2750)
4.500	(114,3)	11.60	K-55	LT&C	1800	(2430)	1350	(1830)	2240	(3040)
4.500	(114,3)	11.60	C-75	LT&C	2150	(2910)	1610	(2180)	2680	(3640)
4.500	(114,3)	13.50	C-75	LT&C	2600	(3530)	1950	(2640)	3250	(4410)
4.500	(114,3)	11.60	L-80	LT&C	2230	(3030)	1670	(2270)	2790	(3780)
4.500	(114,3)	13.50	L-80	LT&C	2710	(3670)	2030	(2750)	3380	(4590)
4.500	(114,3)	11.60	N-80	LT&C	2280	(3090)	1710	(2310)	2850	(3860)
4.500	(114,3)	13.50	N-80	LT&C	2760	(3740)	2070	(2810)	3450	(4680)
4.500	(114,3)	11.60	C-90	LT&C	2450	(3320)	1840	(2490)	3060	(4150)
4.500	(114,3)	13.50	C-90	LT&C	2970	(4030)	2230	(3020)	3710	(5040)
4.500	(114,3)	11.60	C-95	LT&C	2580	(3500)	1940	(2630)	3230	(4380)
4.500	(114,3)	13.50	C-95	LT&C	3130	(4240)	2350	(3180)	3910	(5310)
4.500	(114,3)	11.60	P-110	LT&C	3020	(4100)	2270	(3070)	3780	(5120)
4.500	(114,3)	13.50	P-110	LT&C	3660	(4960)	2750	(3720)	4580	(6200)
4.500	(114,3)	15.10	P-110	LT&C	4400	(5960)	3300	(4470)	5500	(7450)
4.500	(114,3)	15.10	Q-125	LT&C	4910	(6650)	3680	(4990)	6130	(8320)
5.000	(127,0)	11.50	J-55	ST&C	1330	(1810)	1000	(1350)	1660	(2260)
5.000	(127,0)	13.00	J-55	ST&C	1690	(2290)	1260	(1710)	2110	(2860)
5.000	(127,0)	15.00	J-55	ST&C	2070	(2800)	1550	(2100)	2580	(3500)
5.000	(127,0)	11.50	K-55	ST&C	1470	(1990)	1100	(1490)	1830	(2490)
5.000	(127,0)	13.00	K-55	ST&C	1860	(2520)	1390	(1890)	2320	(3150)
5.000	(127,0)	15.00	K-55	ST&C	2280	(3090)	1710	(2320)	2850	(3860)
5.000	(127,0)	13.00	J-55	LT&C	1820	(2470)	1360	(1850)	2270	(3080)
5.000	(127,0)	15.00	J-55	LT&C	2230	(3020)	1670	(2270)	2790	(3780)
5.000	(127,0)	13.00	K-55	LT&C	2010	(2730)	1510	(2040)	2510	(3410)
5.000	(127,0)	15.00	K-55	LT&C	2460	(3340)	1850	(2500)	3080	(4170)
5.000	(127,0)	15.00	C-75	LT&C	2960	(4010)	2220	(3010)	3690	(5010)
5.000	(127,0)	18.00	C-75	LT&C	3770	(5110)	2830	(3830)	4710	(6390)
5.000	(127,0)	21.40	C-75	LT&C	4660	(6320)	3500	(4740)	5830	(7900)
5.000	(127,0)	24.10	C-75	LT&C	5390	(7310)	4040	(5480)	6740	(9140)
5.000	(127,0)	15.00	L-80	LT&C	3080	(4170)	2310	(3130)	3850	(5220)
5.000	(127,0)	18.00	L-80	LT&C	3930	(5320)	2940	(3990)	4910	(6650)
5.000	(127,0)	21.40	L-80	LT&C	4860	(6590)	3640	(4940)	6070	(8230)
5.000	(127,0)	24.10	L-80	LT&C	5610	(7610)	4210	(5710)	7020	(9520)
5.000	(127,0)	15.00	N-80	LT&C	3140	(4250)	2350	(3190)	3920	(5320)
5.000	(127,0)	18.00	N-80	LT&C	4000	(5420)	3000	(4070)	5000	(6780)
5.000	(127,0)	21.40	N-80	LT&C	4950	(6710)	3710	(5030)	6190	(8390)
5.000	(127,0)	24.10	N-80	LT&C	5720	(7760)	4290	(5820)	7150	(9700)

TABLE 1.1 (cont.)
RECOMMENDED CASING MAKE-UP TORQUE
8-ROUND-THREAD CASING

1		2	2	4	5		6		7	
Size Outside Diameter		Nominal Weight, Threads and Coupling lbs/ft	Grade	Thread	Torque, ft-lbs (N·m)					
in.	(mm)				Optimum	Minimum	Maximum			
5.000	(127,0)	15.00	C-90	LT&C	3380	(4590)	2540	(3440)	4230	(5730)
5.000	(127,0)	18.00	C-90	LT&C	4310	(5850)	3240	(4390)	5390	(7310)
5.000	(127,0)	21.40	C-90	LT&C	5340	(7240)	4000	(5430)	6670	(9050)
5.000	(127,0)	23.20	C-90	LT&C	5880	(7980)	4410	(5980)	7350	(9970)
5.000	(127,0)	24.10	C-90	LT&C	6170	(8370)	4630	(6270)	7710	(10460)
5.000	(127,0)	15.00	C-95	LT&C	3560	(4830)	2670	(3630)	4460	(6040)
5.000	(127,0)	18.00	C-95	LT&C	4550	(6160)	3410	(4620)	5680	(7700)
5.000	(127,0)	21.40	C-95	LT&C	5620	(7630)	4220	(5720)	7030	(9530)
5.000	(127,0)	24.10	C-95	LT&C	6500	(8810)	4880	(6610)	8130	(11020)
5.500	(139,7)	14.00	H-40	ST&C	1300	(1760)	970	(1320)	1620	(2200)
5.500	(139,7)	14.00	J-55	ST&C	1720	(2330)	1290	(1750)	2150	(2920)
5.500	(139,7)	15.50	J-55	ST&C	2020	(2730)	1510	(2050)	2520	(3420)
5.500	(139,7)	17.00	J-55	ST&C	2290	(3110)	1720	(2330)	2860	(3880)
5.500	(139,7)	14.00	K-55	ST&C	1890	(2560)	1420	(1920)	2360	(3200)
5.500	(139,7)	15.50	K-55	ST&C	2220	(3000)	1660	(2250)	2770	(3750)
5.500	(139,7)	17.00	K-55	ST&C	2520	(3410)	1890	(2560)	3150	(4260)
5.500	(139,7)	15.50	J-55	LT&C	2170	(2940)	1630	(2210)	2710	(3680)
5.500	(139,7)	17.00	J-55	LT&C	2470	(3340)	1850	(2510)	3080	(4180)
5.500	(139,7)	15.50	K-55	LT&C	2390	(3240)	1790	(2430)	2990	(4050)
5.500	(139,7)	17.00	K-55	LT&C	2720	(3680)	2040	(2760)	3390	(4600)
5.500	(139,7)	17.00	C-75	LT&C	3270	(4440)	2460	(3330)	4090	(5550)
5.500	(139,7)	20.00	C-75	LT&C	4030	(5460)	3020	(4100)	5040	(6830)
5.500	(139,7)	23.00	C-75	LT&C	4730	(6410)	3550	(4810)	5910	(8020)
5.500	(139,7)	17.00	L-80	LT&C	3410	(4630)	2560	(3470)	4270	(5790)
5.500	(139,7)	20.00	L-80	LT&C	4200	(5700)	3150	(4270)	5250	(7120)
5.500	(139,7)	23.00	L-80	LT&C	4930	(6690)	3700	(5020)	6170	(8360)
5.500	(139,7)	17.00	N-80	LT&C	3480	(4710)	2610	(3530)	4340	(5890)
5.500	(139,7)	20.00	N-80	LT&C	4280	(5800)	3210	(4350)	5350	(7250)
5.500	(139,7)	23.00	N-80	LT&C	5020	(6810)	3770	(5110)	6280	(8510)
5.500	(139,7)	17.00	C-90	LT&C	3750	(5090)	2820	(3820)	4690	(6360)
5.500	(139,7)	20.00	C-90	LT&C	4620	(6270)	3470	(4700)	5780	(7830)
5.500	(139,7)	23.00	C-90	LT&C	5430	(7360)	4070	(5520)	6780	(9190)
5.500	(139,7)	17.00	C-95	LT&C	3960	(5360)	2970	(4020)	4950	(6710)
5.500	(139,7)	20.00	C-95	LT&C	4870	(6600)	3650	(4950)	6090	(8250)
5.500	(139,7)	23.00	C-95	LT&C	5720	(7750)	4290	(5810)	7150	(9690)
5.500	(139,7)	17.00	P-110	LT&C	4620	(6270)	3470	(4700)	5780	(7840)
5.500	(139,7)	20.00	P-110	LT&C	5690	(7720)	4270	(5790)	7110	(9650)
5.500	(139,7)	23.00	P-110	LT&C	6680	(9060)	5010	(6790)	8350	(11320)
5.500	(139,7)	23.00	Q-125	LT&C	7470	(10120)	5600	(7590)	9330	(12650)
6.625	(168,3)	20.00	H-40	ST&C	1840	(2490)	1380	(1870)	2300	(3120)
6.625	(168,3)	20.00	J-55	ST&C	2450	(3320)	1830	(2490)	3060	(4150)
6.625	(168,3)	24.00	J-55	ST&C	3140	(4250)	2350	(3190)	3920	(5320)
6.625	(168,3)	20.00	K-55	ST&C	2670	(3620)	2000	(2710)	3340	(4520)
6.625	(168,3)	24.00	K-55	ST&C	3420	(4640)	2570	(3480)	4280	(5800)
6.625	(168,3)	20.00	J-55	LT&C	2660	(3600)	1990	(2700)	3320	(4500)
6.625	(168,3)	24.00	J-55	LT&C	3400	(4620)	2550	(3460)	4250	(5770)

TABLE 1.1 (cont.)
RECOMMENDED CASING MAKE-UP TORQUE
8-ROUND-THREAD CASING

1		2	2	4	5		6		7	
Size Outside Diameter		Nominal Weight, Threads and Coupling lbs/ft	Grade	Thread	Torque, ft-lbs (N·m)					
in.	(mm)				Optimum		Minimum		Maximum	
6.625	(168,3)	20.00	K-55	LT&C	2900	(3940)	2180	(2950)	3630	(4920)
6.625	(168,3)	24.00	K-55	LT&C	3720	(5050)	2790	(3780)	4650	(6310)
6.625	(168,3)	24.00	C-75	LT&C	4530	(6140)	3390	(4600)	5660	(7670)
6.625	(168,3)	28.00	C-75	LT&C	5520	(7480)	4140	(5610)	6890	(9350)
6.625	(168,3)	32.00	C-75	LT&C	6380	(8650)	4780	(6490)	7970	(10810)
6.625	(168,3)	24.00	L-80	LT&C	4730	(6410)	3550	(4810)	5910	(8010)
6.625	(168,3)	28.00	L-80	LT&C	5760	(7810)	4320	(5860)	7200	(9760)
6.625	(168,3)	32.00	L-80	LT&C	6660	(9030)	5000	(6780)	8330	(11290)
6.625	(168,3)	24.00	N-80	LT&C	4810	(6520)	3600	(4890)	6010	(8150)
6.625	(168,3)	28.00	N-80	LT&C	5860	(7940)	4390	(5960)	7320	(9930)
6.625	(168,3)	32.00	N-80	LT&C	6780	(9190)	5080	(6890)	8470	(11480)
6.625	(168,3)	24.00	C-90	LT&C	5210	(7060)	3910	(5300)	6510	(8830)
6.625	(168,3)	28.00	C-90	LT&C	6350	(8610)	4760	(6450)	7930	(10760)
6.625	(168,3)	32.00	C-90	LT&C	7340	(9950)	5510	(7470)	9180	(12440)
6.625	(168,3)	24.00	C-95	LT&C	5490	(7440)	4120	(5580)	6860	(9300)
6.625	(168,3)	28.00	C-95	LT&C	6690	(9070)	5020	(6800)	8360	(11340)
6.625	(168,3)	32.00	C-95	LT&C	7740	(10490)	5800	(7870)	9670	(13110)
6.625	(168,3)	24.00	P-110	LT&C	6410	(8690)	4810	(6520)	8010	(10860)
6.625	(168,3)	28.00	P-110	LT&C	7810	(10590)	5860	(7940)	9760	(13240)
6.625	(168,3)	32.00	P-110	LT&C	9040	(12250)	6780	(9190)	11290	(15310)
6.625	(168,3)	32.00	Q-125	LT&C	10110	(13710)	7580	(10280)	12640	(17130)
7.000	(177,8)	17.00	H-40	ST&C	1220	(1650)	910	(1240)	1520	(2070)
7.000	(177,8)	20.00	H-40	ST&C	1760	(2380)	1320	(1790)	2200	(2980)
7.000	(177,8)	20.00	J-55	ST&C	2340	(3170)	1750	(2380)	2920	(3960)
7.000	(177,8)	23.00	J-55	ST&C	2840	(3850)	2130	(2890)	3550	(4820)
7.000	(177,8)	26.00	J-55	ST&C	3340	(4530)	2500	(3400)	4170	(5660)
7.000	(177,8)	20.00	K-55	ST&C	2540	(3450)	1910	(2590)	3180	(4310)
7.000	(177,8)	23.00	K-55	ST&C	3090	(4190)	2320	(3150)	3870	(5240)
7.000	(177,8)	26.00	K-55	ST&C	3640	(4930)	2730	(3700)	4540	(6160)
7.000	(177,8)	23.00	J-55	LT&C	3130	(4240)	2350	(3180)	3910	(5300)
7.000	(177,8)	26.00	J-55	LT&C	3670	(4980)	2760	(3740)	4590	(6230)
7.000	(177,8)	23.00	K-55	LT&C	3410	(4630)	2560	(3470)	4270	(5780)
7.000	(177,8)	26.00	K-55	LT&C	4010	(5440)	3010	(4080)	5010	(6800)
7.000	(177,8)	23.00	C-75	LT&C	4160	(5640)	3120	(4230)	5200	(7050)
7.000	(177,8)	26.00	C-75	LT&C	4890	(6630)	3670	(4970)	6110	(8280)
7.000	(177,8)	29.00	C-75	LT&C	5620	(7620)	4220	(5720)	7030	(9530)
7.000	(177,8)	32.00	C-75	LT&C	6330	(8580)	4750	(6440)	7910	(10730)
7.000	(177,8)	35.00	C-75	LT&C	7030	(9530)	5270	(7140)	8780	(11910)
7.000	(177,8)	38.00	C-75	LT&C	7670	(10400)	5750	(7800)	9580	(12990)
7.000	(177,8)	23.00	L-80	LT&C	4350	(5890)	3260	(4420)	5430	(7370)
7.000	(177,8)	26.00	L-80	LT&C	5110	(6930)	3830	(5190)	6380	(8660)
7.000	(177,8)	29.00	L-80	LT&C	5870	(7960)	4410	(5970)	7340	(9960)
7.000	(177,8)	32.00	L-80	LT&C	6610	(8970)	4960	(6720)	8270	(11210)
7.000	(177,8)	35.00	L-80	LT&C	7340	(9950)	5510	(7470)	9180	(12440)
7.000	(177,8)	38.00	L-80	LT&C	8010	(10860)	6010	(8150)	10010	(13580)

TABLE 1.1 (cont.)
 RECOMMENDED CASING MAKE-UP TORQUE
 8-ROUND-THREAD CASING

1		2	2	4	5	6		7	
Size Outside Diameter		Nominal Weight, Threads and Coupling lbs/ft	Grade	Thread	Torque, ft-lbs (N·m)				
in.	(mm)				Optimum	Minimum		Maximum	
7.000	(177,8)	23.00	N-80	LT&C	4420 (5990)	3310	(4490)	5520 (7490)	
7.000	(177,8)	26.00	N-80	LT&C	5190 (7040)	3890	(5280)	6490 (8800)	
7.000	(177,8)	29.00	N-80	LT&C	5970 (8100)	4480	(6070)	7460 (10120)	
7.000	(177,8)	32.00	N-80	LT&C	6720 (9110)	5040	(6840)	8400 (11390)	
7.000	(177,8)	35.00	N-80	LT&C	7460 (10120)	5600	(7590)	9330 (12650)	
7.000	(177,8)	38.00	N-80	LT&C	8140 (11040)	6110	(8280)	10180 (13800)	
7.000	(177,8)	23.00	C-90	LT&C	4790 (6500)	3590	(4870)	5990 (8120)	
7.000	(177,8)	26.00	C-90	LT&C	5630 (7630)	4220	(5730)	7040 (9540)	
7.000	(177,8)	29.00	C-90	LT&C	6480 (8780)	4860	(6590)	8100 (10980)	
7.000	(177,8)	32.00	C-90	LT&C	7290 (9880)	5470	(7410)	9110 (12360)	
7.000	(177,8)	35.00	C-90	LT&C	8090 (10970)	6070	(8230)	10120 (13720)	
7.000	(177,8)	38.00	C-90	LT&C	8830 (11970)	6620	(8980)	11040 (14970)	
7.000	(177,8)	23.00	C-95	LT&C	5050 (6850)	3790	(5140)	6310 (8560)	
7.000	(177,8)	26.00	C-95	LT&C	5930 (8050)	4450	(6030)	7420 (10060)	
7.000	(177,8)	29.00	C-95	LT&C	6830 (9250)	5120	(6940)	8530 (11570)	
7.000	(177,8)	32.00	C-95	LT&C	7680 (10420)	5760	(7810)	9600 (13020)	
7.000	(177,8)	35.00	C-95	LT&C	8530 (11560)	6400	(8670)	10660 (14460)	
7.000	(177,8)	38.00	C-95	LT&C	9310 (12620)	6980	(9470)	11640 (15780)	
7.000	(177,8)	26.00	P-110	LT&C	6930 (9390)	5200	(7050)	8660 (11740)	
7.000	(177,8)	29.00	P-110	LT&C	7970 (10800)	7980	(8100)	9960 (13510)	
7.000	(177,8)	32.00	P-110	LT&C	8970 (12160)	6730	(9120)	11210 (15200)	
7.000	(177,8)	35.00	P-110	LT&C	9960 (13500)	7470	(10130)	12450 (16880)	
7.000	(177,8)	38.00	P-110	LT&C	10870 (14730)	8150	(11050)	13580 (18420)	
7.000	(177,8)	35.00	Q-125	LT&C	11150 (15110)	8360	(11340)	13930 (18890)	
7.000	(177,8)	38.00	Q-125	LT&C	12160 (16490)	9120	(12370)	15210 (20620)	
7.625	(193,7)	24.00	H-40	ST&C	2120 (2870)	1590	(2150)	2640 (3590)	
7.625	(193,7)	26.40	J-55	ST&C	3150 (4270)	2360	(3200)	3940 (5340)	
7.625	(193,7)	26.40	K-55	ST&C	3420 (4640)	2570	(3480)	4280 (5800)	
7.625	(193,7)	26.40	J-55	LT&C	3460 (4690)	2600	(3520)	4330 (5870)	
7.625	(193,7)	26.40	K-55	LT&C	3770 (5110)	2820	(3830)	4710 (6380)	
7.625	(193,7)	26.40	C-75	LT&C	4610 (6250)	3460	(4690)	5760 (7810)	
7.625	(193,7)	29.70	C-75	LT&C	5420 (7340)	4060	(5510)	6770 (9180)	
7.625	(193,7)	33.70	C-75	LT&C	6350 (8610)	4760	(6460)	7940 (10760)	
7.625	(193,7)	39.00	C-75	LT&C	7510 (10190)	5640	(7640)	9390 (12730)	
7.625	(193,7)	42.80	C-75	LT&C	8520 (11560)	6390	(8670)	10660 (14450)	
7.625	(193,7)	47.10	C-75	LT&C	9530 (12920)	7150	(9690)	11910 (16150)	
7.625	(193,7)	26.40	L-80	LT&C	4820 (6530)	3610	(4900)	6020 (8170)	
7.625	(193,7)	29.70	L-80	LT&C	5670 (7680)	4250	(5760)	7080 (9600)	
7.625	(193,7)	33.70	L-80	LT&C	6640 (9000)	4980	(6750)	8300 (11250)	
7.625	(193,7)	39.00	L-80	LT&C	7860 (10650)	5890	(7990)	9820 (13320)	
7.625	(193,7)	42.80	L-80	LT&C	8910 (12090)	6690	(9060)	11140 (15110)	
7.625	(193,7)	47.10	L-80	LT&C	9970 (13520)	7480	(10140)	12460 (16890)	
7.625	(193,7)	26.40	N-80	LT&C	4900 (6640)	3670	(4980)	6120 (8300)	
7.625	(193,7)	29.70	N-80	LT&C	5750 (7800)	4320	(5850)	7190 (9750)	
7.625	(193,7)	33.70	N-80	LT&C	6740 (9140)	5060	(6860)	8430 (11430)	
7.625	(193,7)	39.00	N-80	LT&C	7980 (10820)	5990	(8120)	9980 (13530)	
7.625	(193,7)	42.80	N-80	LT&C	9060 (12280)	6790	(9210)	11320 (15350)	
7.625	(193,7)	47.10	N-80	LT&C	10130 (13730)	7590	(10300)	12660 (17160)	

TABLE 1.1 (cont.)
RECOMMENDED CASING MAKE-UP TORQUE
8-ROUND-THREAD CASING

1		2	2	4	5	6		7
Size Outside Diameter		Nominal Weight, Threads and Coupling lbs/ft	Grade	Thread	Torque, ft-lbs (N·m)			
in.	(mm)				Optimum	Minimum	Maximum	
7.625	(193,7)	26.40	C-90	LT&C	5320 (7210)	3990 (5410)	6650 (9010)	
7.625	(193,7)	29.70	C-90	LT&C	6250 (8470)	4690 (6360)	7810 (10590)	
7.625	(193,7)	33.70	C-90	LT&C	7330 (9930)	5490 (7450)	9160 (12420)	
7.625	(193,7)	39.00	C-90	LT&C	8670 (11750)	6500 (8820)	10840 (14690)	
7.625	(193,7)	42.80	C-90	LT&C	9840 (13330)	7380 (10000)	12290 (16670)	
7.625	(193,7)	45.30	C-90	LT&C	10450 (14160)	7840 (10620)	13060 (17710)	
7.625	(193,7)	47.10	C-90	LT&C	11000 (14910)	8250 (11180)	13750 (18640)	
7.625	(193,7)	26.40	C-95	LT&C	5600 (7600)	4200 (5700)	7010 (9500)	
7.625	(193,7)	29.70	C-95	LT&C	6590 (8930)	4940 (6700)	8230 (11160)	
7.625	(193,7)	33.70	C-95	LT&C	7720 (10470)	5790 (7850)	9650 (13090)	
7.625	(193,7)	39.00	C-95	LT&C	9140 (12390)	6850 (9290)	11420 (15480)	
7.625	(193,7)	42.80	C-95	LT&C	10370 (14050)	7770 (10540)	12960 (17570)	
7.625	(193,7)	47.10	C-95	LT&C	11590 (15720)	8690 (11790)	14490 (19640)	
7.625	(193,7)	29.70	P-110	LT&C	7690 (10420)	5770 (7820)	9610 (13030)	
7.625	(193,7)	33.70	P-110	LT&C	9010 (12220)	6760 (9160)	11260 (15270)	
7.625	(193,7)	39.00	P-110	LT&C	10660 (14460)	8000 (10840)	13330 (18070)	
7.625	(193,7)	42.80	P-110	LT&C	12100 (16400)	9070 (12300)	15120 (20510)	
7.625	(193,7)	47.10	P-110	LT&C	13530 (18340)	10150 (13760)	16910 (22930)	
7.625	(193,7)	39.00	Q-125	LT&C	11940 (16190)	8960 (12150)	14930 (20240)	
7.625	(193,7)	42.80	Q-125	LT&C	13550 (18370)	10160 (13780)	16940 (22970)	
7.625	(193,7)	45.30	Q-125	LT&C	14390 (19520)	10800 (14640)	17990 (24390)	
7.625	(193,7)	47.10	Q-125	LT&C	15150 (20540)	11360 (15410)	18940 (25680)	
8.625	(219,1)	28.00	H-40	ST&C	2330 (3150)	1740 (2370)	2910 (3940)	
8.625	(219,1)	32.00	H-40	ST&C	2790 (3780)	2090 (2840)	3490 (4730)	
8.625	(219,1)	24.00	J-55	ST&C	2440 (3310)	1830 (2480)	3050 (4140)	
8.625	(219,1)	32.00	J-55	ST&C	3720 (5050)	2790 (3790)	4660 (6310)	
8.625	(219,1)	36.00	J-55	ST&C	4340 (5880)	3250 (4410)	5420 (7350)	
8.625	(219,1)	24.00	K-55	ST&C	2630 (3570)	1970 (2680)	3290 (4460)	
8.625	(219,1)	32.00	K-55	ST&C	4020 (5460)	3020 (4090)	5030 (6820)	
8.625	(219,1)	36.00	K-55	ST&C	4680 (6350)	3510 (4760)	5850 (7940)	
8.625	(219,1)	32.00	J-55	LT&C	4170 (5660)	3130 (4240)	5220 (7070)	
8.625	(219,1)	36.00	J-55	LT&C	4860 (6590)	3640 (4940)	6070 (8230)	
8.625	(219,1)	32.00	K-55	LT&C	4520 (6130)	3390 (4600)	5650 (7660)	
8.625	(219,1)	36.00	K-55	LT&C	5260 (7140)	3950 (5350)	6580 (8920)	
8.625	(219,1)	36.00	C-75	LT&C	6480 (8780)	4860 (6590)	8100 (10980)	
8.625	(219,1)	40.00	C-75	LT&C	7420 (10060)	5560 (7540)	9270 (12570)	
8.625	(219,1)	44.00	C-75	LT&C	8340 (11310)	6260 (8490)	10430 (14140)	
8.625	(219,1)	49.00	C-75	LT&C	9390 (12730)	7040 (9550)	11730 (15910)	
8.625	(219,1)	36.00	L-80	LT&C	6780 (9190)	5090 (6900)	8480 (11490)	
8.625	(219,1)	40.00	L-80	LT&C	7760 (10530)	5820 (7900)	9710 (13160)	
8.625	(219,1)	44.00	L-80	LT&C	8740 (11840)	6550 (8880)	10920 (14800)	
8.625	(219,1)	49.00	L-80	LT&C	9830 (13320)	7370 (9990)	12280 (16650)	
8.625	(219,1)	36.00	N-80	LT&C	6880 (9330)	5160 (7000)	8600 (11660)	
8.625	(219,1)	40.00	N-80	LT&C	7880 (10680)	5910 (8010)	9850 (13360)	
8.625	(219,1)	44.00	N-80	LT&C	8870 (12020)	6650 (9020)	11080 (15030)	
8.625	(219,1)	49.00	N-80	LT&C	9970 (13520)	7480 (10140)	12470 (16900)	
8.625	(219,1)	36.00	C-90	LT&C	7490 (10150)	5620 (7620)	9360 (12690)	
8.625	(219,1)	40.00	C-90	LT&C	8580 (11630)	6430 (8720)	10720 (14530)	
8.625	(219,1)	44.00	C-90	LT&C	9650 (13080)	7240 (9810)	12060 (16350)	
8.625	(219,1)	49.00	C-90	LT&C	10850 (14710)	8140 (11040)	13570 (18390)	

TABLE 1.1 (cont.)
 RECOMMENDED CASING MAKE-UP TORQUE
 8-ROUND-THREAD CASING

1		2	2	4	5	6		7	
Size Outside Diameter		Nominal Weight, Threads and Coupling lbs/ft	Grade	Thread	Torque, ft-lbs (N·m)				
in.	(mm)				Optimum	Minimum		Maximum	
8.625	(219,1)	36.00	C-95	LT&C	7890 (10700)	5920 (8030)		9870 (13380)	
8.625	(219,1)	40.00	C-95	LT&C	9040 (12260)	6780 (9190)		11300 (15320)	
8.625	(219,1)	44.00	C-95	LT&C	10170 (13790)	7630 (10340)		12710 (17230)	
8.625	(219,1)	49.00	C-95	LT&C	11440 (15510)	8580 (11630)		14300 (19390)	
8.625	(219,1)	40.00	P-110	LT&C	10550 (14300)	7910 (10720)		13180 (17870)	
8.625	(219,1)	44.00	P-110	LT&C	11860 (16090)	8900 (12060)		14830 (20110)	
8.625	(219,1)	49.00	P-110	LT&C	13350 (18100)	10010 (13570)		16680 (22620)	
8.625	(219,1)	49.00	Q-125	LT&C	14960 (20280)	11220 (15210)		18700 (25350)	
9.625	(244,5)	32.30	H-40	ST&C	2540 (3440)	1900 (2580)		3170 (4300)	
9.625	(244,5)	36.00	H-40	ST&C	2940 (3990)	2210 (2990)		3680 (4990)	
9.625	(244,5)	36.00	J-55	ST&C	3940 (5340)	2950 (4000)		4920 (6670)	
9.625	(244,5)	40.00	J-55	ST&C	4520 (6120)	3390 (4590)		5650 (7660)	
9.625	(244,5)	36.00	K-55	ST&C	4230 (5740)	3180 (4310)		5290 (7180)	
9.625	(244,5)	40.00	K-55	ST&C	4860 (6590)	3640 (4940)		6070 (8240)	
9.625	(244,5)	36.00	J-55	LT&C	4530 (6140)	3400 (4610)		5660 (7680)	
9.625	(244,5)	40.00	J-55	LT&C	5200 (7050)	3900 (5290)		6500 (8810)	
9.625	(244,5)	36.00	K-55	LT&C	4890 (6630)	3670 (4970)		6110 (8290)	
9.625	(244,5)	40.00	K-55	LT&C	5610 (7610)	4210 (5710)		7020 (9510)	
9.625	(244,5)	40.00	C-75	LT&C	6940 (9410)	5200 (7060)		8740 (11760)	
9.625	(244,5)	43.50	C-75	LT&C	7760 (10530)	5820 (7890)		9700 (13160)	
9.625	(244,5)	47.00	C-75	LT&C	8520 (11550)	6390 (8660)		10650 (14440)	
9.625	(244,5)	53.50	C-75	LT&C	9990 (13540)	7490 (10160)		12490 (16930)	
9.625	(244,5)	40.00	L-80	LT&C	7270 (9860)	5450 (7390)		9090 (12320)	
9.625	(244,5)	43.50	L-80	LT&C	8130 (11030)	6100 (8270)		10170 (13790)	
9.625	(244,5)	47.00	L-80	LT&C	8930 (12100)	6690 (9080)		11160 (15130)	
9.625	(244,5)	53.50	L-80	LT&C	10470 (14190)	7850 (10640)		13080 (17740)	
9.625	(244,5)	40.00	N-80	LT&C	7370 (10000)	5530 (7500)		9220 (12500)	
9.625	(244,5)	43.50	N-80	LT&C	8250 (11190)	6190 (8390)		10310 (13980)	
9.625	(244,5)	47.00	N-80	LT&C	9050 (12270)	6790 (9200)		11320 (15340)	
9.625	(244,5)	53.50	N-80	LT&C	10620 (14390)	7960 (10790)		13270 (17990)	
9.625	(244,5)	40.00	C-90	LT&C	8040 (10900)	6030 (8170)		10050 (13620)	
9.625	(244,5)	43.50	C-90	LT&C	8990 (12190)	6740 (9140)		11240 (15240)	
9.625	(244,5)	47.00	C-90	LT&C	9870 (13380)	7400 (10030)		12330 (16720)	
9.625	(244,5)	53.50	C-90	LT&C	11570 (15690)	8680 (11770)		14460 (19610)	
9.625	(244,5)	40.00	C-95	LT&C	8470 (11490)	6360 (8620)		10590 (14360)	
9.625	(244,5)	43.50	C-95	LT&C	9480 (12850)	7110 (9640)		11850 (16060)	
9.625	(244,5)	47.00	C-95	LT&C	10400 (14100)	7800 (10580)		13000 (17630)	
9.625	(244,5)	53.50	C-95	LT&C	12200 (16540)	9150 (12400)		15250 (20670)	
9.625	(244,5)	43.50	P-110	LT&C	11050 (14980)	8290 (11240)		13810 (18730)	
9.625	(244,5)	47.00	P-110	LT&C	12130 (16440)	9090 (12330)		15160 (20550)	
9.625	(244,5)	53.50	P-110	LT&C	14220 (19280)	10670 (14460)		17780 (24100)	
9.625	(244,5)	47.00	Q-125	LT&C	13600 (18440)	10200 (13830)		17000 (23050)	
9.625	(244,5)	53.50	Q-125	LT&C	15950 (21620)	11960 (16220)		19940 (27030)	

TABLE 1.1 (cont.)
RECOMMENDED CASING MAKE-UP TORQUE
8-ROUND-THREAD CASING

1		2	2	4	5		6		7	
Size Outside Diameter		Nominal Weight, Threads and Coupling lbs/ft	Grade	Thread	Optimum		Torque, ft-lbs (N·m)		Maximum	
in.	(mm)						Minimum			
10.750	(273,1)	32.75	H-40	ST&C	2050	(2790)	1540	(2090)	2570	(3480)
10.750	(273,1)	40.50	H-40	ST&C	3140	(4250)	2350	(3190)	3920	(5320)
10.750	(273,1)	40.50	J-55	ST&C	4200	(5700)	3150	(4270)	5250	(7120)
10.750	(273,1)	45.55	J-55	ST&C	4930	(6680)	3700	(5010)	6160	(8360)
10.750	(273,1)	51.00	J-55	ST&C	5650	(7660)	4240	(5750)	7070	(9580)
10.750	(273,1)	40.50	K-55	ST&C	4500	(6100)	3380	(4580)	5630	(7630)
10.750	(273,1)	45.55	K-55	ST&C	5280	(7160)	3960	(5370)	6600	(8960)
10.750	(273,1)	51.00	K-55	ST&C	6060	(8210)	4540	(6160)	7570	(10270)
10.750	(273,1)	51.00	C-75	ST&C	7560	(10250)	5670	(7690)	9450	(12810)
10.750	(273,1)	55.50	C-75	ST&C	8420	(11420)	6320	(8560)	10530	(14270)
10.750	(273,1)	51.00	L-80	ST&C	7940	(10760)	5950	(8070)	9920	(13450)
10.750	(273,1)	55.50	L-80	ST&C	8840	(11990)	6630	(8990)	11050	(14980)
10.750	(273,1)	51.00	N-80	ST&C	8040	(10900)	6030	(8170)	10050	(13620)
10.750	(273,1)	55.50	N-80	ST&C	8950	(12140)	6710	(9100)	11190	(15170)
10.750	(273,1)	51.00	C-90	ST&C	8790	(11920)	6590	(8940)	10990	(14890)
10.750	(273,1)	55.50	C-90	ST&C	9790	(13270)	7340	(9950)	12240	(16590)
10.750	(273,1)	51.00	C-95	ST&C	9270	(12560)	6950	(9420)	11580	(15700)
10.750	(273,1)	55.50	C-95	ST&C	10320	(13990)	7740	(10490)	12900	(17490)
10.750	(273,1)	51.00	P-110	ST&C	10790	(14630)	8090	(10970)	13490	(18290)
10.750	(273,1)	55.50	P-110	ST&C	12020	(16300)	9020	(12220)	15030	(20370)
10.750	(273,1)	60.70	P-110	ST&C	13370	(18130)	10030	(13600)	16720	(22660)
10.750	(273,1)	65.70	P-110	ST&C	14710	(19950)	11030	(14960)	18390	(24930)
10.750	(273,1)	60.70	Q-125	ST&C	15020	(20360)	11260	(15270)	18770	(25460)
10.750	(273,1)	65.70	Q-125	ST&C	16520	(22400)	12390	(16800)	20650	(28000)
11.750	(298,5)	42.00	H-40	ST&C	3070	(4170)	2310	(3130)	3840	(5210)
11.750	(298,5)	47.00	J-55	ST&C	4770	(6460)	3570	(4850)	5960	(8080)
11.750	(298,5)	54.00	J-55	ST&C	5680	(7700)	4260	(5770)	7100	(9620)
11.750	(298,5)	60.00	J-55	ST&C	6490	(8800)	4870	(6600)	8110	(11000)
11.750	(298,5)	47.00	K-55	ST&C	5090	(6900)	3820	(5180)	6360	(8630)
11.750	(298,5)	54.00	K-55	ST&C	6060	(8220)	4550	(6170)	7580	(10280)
11.750	(298,5)	60.00	K-55	ST&C	6930	(9400)	5200	(7050)	8660	(11750)
11.750	(298,5)	60.00	C-75	ST&C	8690	(11780)	6520	(8830)	10860	(14720)
11.750	(298,5)	60.00	L-80	ST&C	9130	(12370)	6840	(9280)	11410	(15470)
11.750	(298,5)	60.00	N-80	ST&C	9240	(12420)	6930	(9390)	11550	(15650)
11.750	(298,5)	60.00	C-90	ST&C	10110	(13710)	7590	(10290)	12640	(17140)
11.750	(298,5)	60.00	C-95	ST&C	10660	(14460)	8000	(10840)	13330	(18070)
11.750	(298,5)	60.00	P-110	ST&C	12420	(16830)	9310	(12630)	15520	(21040)
11.750	(298,5)	60.00	Q-125	ST&C	13950	(18920)	10470	(14190)	17440	(23650)
13.375	(339,7)	48.00	H-40	ST&C	3220	(4370)	2420	(3280)	4030	(5460)
13.375	(339,7)	54.50	J-55	ST&C	5140	(6970)	3860	(5230)	6430	(8710)
13.375	(339,7)	61.00	J-55	ST&C	5950	(8070)	4460	(6050)	7440	(10090)
13.375	(339,7)	68.00	J-55	ST&C	6750	(9160)	5070	(6870)	8440	(11450)