Specification for Casing and Tubing

API SPECIFICATION 5CT
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ERRATA 2

Page 193, **Table E.23**, Label 1, 8-5/8, Drift diameter 7.286 in *shall be amended to*:

7.386

Date of Issue: September 2012
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ERRATA 1

This errata corrects editorial errors in the 9th Edition of API Spec 5CT.

Page 1, Section 1.1, 4th paragraph, 6th hyphen should read:

— integral tubing (IJ).

Page 3-4, Section 3, replace ISO references: ISO 9303, ISO 9304, ISO 9305, ISO 9402, ISO 9598, ISO 9764, and ISO 13665, as follows:

ISO 9303 ISO 9305	ISO 10893-10, *Steel — Non-destructive testing — Part 10: Automatic full peripheral ultrasonic testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of longitudinal and/or transversal imperfections*
ISO 9304	ISO 10893-2, *Steel — Non-destructive testing — Part 2: Automatic eddy current testing of seamless and welded (except submerged arc-welded) steel tubes for the detection of imperfections*
ISO 9402 ISO 9598	ISO 10893-3, *Steel — Non-destructive testing — Part 3: Automatic full peripheral flux leakage testing of seamless and welded (except submerged arc-welded) ferromagnetic steel tubes for the detection of longitudinal and/or transversal imperfections*
ISO 9764	ISO 10893-11, *Steel — Non-destructive testing — Part 11: Automatic ultrasonic testing of weld seam of welded steel tubes for the detection of longitudinal and/or transversal imperfections*
ISO 13665	ISO 10893-5, *Steel — Non-destructive testing — Part 5: Magnetic particle inspection of seamless and welded ferromagnetic steel tubes for the detection of surface imperfections*

Page 8, Section 4.1.38, delete "standard" in definition to read:

casing or tubing, or thick-wall tubes or mechanical tubes, or bar stock used for the manufacture of pup joints

Page 11, Section 5.2.1, add reference to 8.12.6 in Type of connection to read:

Type of connection: SC LC or BC or other connection	8.12.2, 8.12.6, Table C.1, or Table E.1

Page 11, Section 5.2.1, Range Length should read:

Range length or length of pup joints

Page 11, Section 5.2.2, revise reference 7.5.6 in Impact testing to read:

Impact testing for Group 1 Grades N80Q and R95, Group 2 (except M65), and Group 3	7.5.3, A.10 SR16

Page 11, Section 5.2.2, delete the following:

Statistical tensile test - Grades C90, T95, C110	A.12 SR38

Page 11, Section 5.2.3, add the following after the line Impact of Group 1 non-heat treated pipe:

Alternative hardenability requirement for products with a wall thickness of 30 mm or larger	7.10.2

Page 12, Section 5.2.3, add the following after the Upset Casing – Grade 125 Only line to read:

Electric-weld casing and pup joints – Groups 1& 2	A.14 SR40

Page 12, Section 5.2.3, add reference to 6.1 in Electric-weld casing and pup joints – Grades P110 Q125 to read:

Electric-weld casing and pup joints – Grades P110 and Q125	6.1, A.6 SR11

Page 12, Section 5.2.3, delete the following:

Special end finish for casing, couplings or pup joints	8.12.6, 9.11.2

Page 12, Section 5.3.1, Range Length should read:

Range length or length of pup joints

Page 12, Section 5.3.2, revise reference 7.5.6 in Impact testing to read:

Impact testing for Group 1 Grades N80Q and R95, Group 2 (except M65), and Group 3	7.5.3, A.10 SR16

Page 13, Section 5.3.3, add the following after the line Impact of Group 1 non-heat treated pipe:

Alternative hardenability requirement for products with a wall thickness of 30 mm (1.181 in) or larger – C110	7.10.2

Page 13, Section 5.3.3, delete the following:

Extended length upsets – EU	8.11.6
Upset length – regular or extended	8.11.6
Special end finish for tubing, couplings or pup joints	8.12.6, 9.11.3

Page 13, Section 5.3.3, add the following after the Thread Protectors line to read:

Electric-weld tubing and pup joints – Groups 1& 2	A.14 SR40

Page 14, Section 5.4.2, revise reference 7.5.3 in Impact testing to read:

Impact testing	7.4, 7.6, A.10 SR16

Page 14, Section 5.4.2, add the following after Impact testing to read:

Alternative hardenability requirement for products with a wall thickness of 30 mm or larger	7.10.2

Page 14, Section 6.1, 5th paragraph should read:

Grade C110 product shall not be upset unless agreed between the purchaser and the manufacturer.

Page 14, Section 6.2.1, 1st paragraph, delete 2nd sentence and revise 4th sentence to read:

When heat treated, upset product shall be heat treated full-body, full-length after upsetting.

Page 15, Section 6.2.2, 1st paragraph should read:

For grades J55 and K55 products heat treatment is not mandatory. A heat treatment, consistent with Table C.3 footnote b or Table E.3 footnote b, shall be applied if specified on the purchase agreement or may be applied at the manufacturer's option.

Page 16, Section 6.5, in each bullet point, replace pipe with product as follows:

- for seamless, as-rolled product: final reheating practice and hot sizing or stretch-reducing. If applicable, upsetting, cold-working;
- for seamless, heat-treated product: heat treatment;
- for electric-welded, as-rolled product: sizing and seam welding. If applicable, seam heat treatment and upsetting;
- for electric-welded, heat-treated product: seam welding and full-body, full-length heat treatment.

Page 23, Section 7.7.1 b), 2nd paragraph, revise 1st sentence to read:

For Grade C110, if the Brinell or Rockwell C-scale hardness number does not exceed 286 HBW or 30 HRC respectively, then the length or piece is acceptable.

Page 24, Section 7.7.2, revise sentence to read:

No hardness limits are specified, but the maximum variation is restricted as a manufacturing control in accordance with 7.8 and 7.9.

Page 25, Section 7.14.2 b), add a 2nd paragraph as follows:

If Method A is specified for the SSC test (in accordance with ANSI-NACE TM0177-2005), manufacturers shall, for each lot as defined in 10.2, demonstrate that the product meets or exceeds the 85 % YSmin requirement for three specimens, one each from the ends of three different products selected from sub-lots composed of the front one-third, middle one-third and back one-third of the lot. The selection criteria in 7.14.3 shall apply to each of the sub-lots, including the random selection by agreement.

Page 26, Section 7.14.2 e), add 2nd and 3rd paragraphs as follows:

For Grade C110 a re-test may be carried out if only one of the initial specimens fails. If more than one of the initial specimens fails, the lot shall be rejected. A retest may be performed on two further test specimens taken from an area of the product adjacent to where the initial failed test specimen was taken. If either of the retest specimens fails, the lot shall be rejected. Rejected lots may be re-heat treated and tested as new lots.

By agreement between the purchaser and the manufacturer, the number of specimens per lot required may be reduced to no less than one with a process control that is sufficient to ensure that the product meets or exceeds the 85% YSmin threshold.

Page 26, Section 7.14.4, revise title to read:

Test solution

Page 28, Section 8, revise title to read:

Dimensions, masses, tolerances, product ends and defects

Page 28, Section 8.2, 4th paragraph, revise the last sentence to read:

The manufacturer shall document the measuring devices utilized as “adjustable” or “non-adjustable”.

Page 29, Section 8.3.2, 1st paragraph, revise the 1st sentence to read:

The outside diameter for pipe shall be within the tolerances specified in 8.11.1.

Page 31, Section 8.10, 2nd paragraph, revise to read:

When specified by the purchaser as "alternate drift pipe":

— pipe in sizes and masses in Table C.29 or Table E.29 shall be tested with the alternative drift mandrels as shown, unless another size is specified on the purchase agreement

— pipe in sizes and masses not in Tables C.29 or E.29 shall be tested with the alternative drift mandrels as specified on the purchase agreement

Pipe which is drift tested with the alternate drift mandrels shall be marked as described in Clause 11.

Page 36, Section 9.2.9, revise EUE to EU to read:

Grades N80 Type 1 and N80Q EU tubing shall be furnished with Grade P110 special clearance couplings when specified on the purchase agreement.

Page 38, Section 9.14, 4th paragraph, revise to read:

Permissible imperfections, see Table C.36 or Table E.36, may be removed or reduced by machining or grinding on the outer surface.

Page 40, Section 10.4.1, remove "except C110" from the title, and revise 2nd paragraph to read:

For Grades C90 and T95 PSL2 and PSL3 and Grade C110 the stress relief of tempered products shall not be considered "heat treatment" provided the stress relief temperature is at least 30° C (50° F) below the final tempering temperature.

Page 51, Section 10.7.9, revise the 1st sentence to read:

If the results of a test do not meet the requirements of 7.4 to 7.6, as applicable, and do not qualify for re-testing in accordance with 10.7.8, then an additional three test specimens shall be removed from each of three additional lengths from the lot.

Page 52, Section 10.10, 4th paragraph, revise to read:

For Method A, full-size smooth tensile test specimens shall be used except where sub-size smooth tensile test specimens are required because of product size constraints.

Page 54, Section 10.12.3, 3rd paragraph, delete the 2nd sentence:

The alternative test pressures are given in parentheses in the tables.

Page 55, Section 10.13.2, 1st paragraph, replace reference to 8.11.1 with 8.3.2, and revise 4th paragraph to read:

If any product fails to meet the requirements, the provisions of 10.13.3 shall apply.

Page 56, Section 10.13.4, 3rd paragraph, revise last two sentences to read:

The end of the pin contacting the inside surface of the product shall be rounded to a maximum radius of 38,1 mm (1½ in) for product sizes Label 1: 6-5/8, and larger, a maximum radius of d/4 for products less than Label 1: 6-5/8, with a minimum radius of 3,2 mm (1/8 in). The end of the pin contacting the outside surface of the product shall be either flat or rounded to a radius of not less than 38,1 mm (1½ in).

Page 57, Section 10.13.7, delete the Note.

Page 60, Section 10.15.6 list, revise to read:

a) ultrasonic testing in accordance with ISO 10893-10 or ASTM E213;

b) flux leakage testing in accordance with ISO 10893-3 or ASTM E570;

c) eddy current concentric coil testing in accordance with ISO 10893-2 or ASTM E309;

d) for pipe outside surface, magnetic particle inspection in accordance with ISO 10893-5 or ASTM E709.

Page 60, Section 10.15.7 list, revise to read:

a) ultrasonic testing in accordance with ISO 10893-10 or ASTM E213 (longitudinal) and ISO 10893-10 or ASTM E213 (transverse);

b) flux leakage testing in accordance with ISO 10893-3 or ASTM E570 (longitudinal) and ISO 10893-3 or ASTM E570 (transverse);

c) eddy current concentric coil testing in accordance with ISO 10893-2 or ASTM E309.

Page 61, Section 10.15.8 list, revise to read:

a) ultrasonic testing in accordance with ISO 10893-10 or ASTM E213 (longitudinal) and ISO 10893-10 or ASTM E213 (transverse);

b) flux leakage testing in accordance with ISO 10893-3 or ASTM E570 (longitudinal) and ISO 10893-3 or ASTM E570 (transverse);

c) eddy current concentric coil testing in accordance with ISO 10893-2 or ASTM E309.

Page 61, Section 10.15.9 list, revise to read:

a) flux leakage testing to acceptance level F2/L2 in accordance with ISO 10893-3 or ASTM E570 (longitudinal) and ISO 10893-3 or ASTM E570 (transverse);

b) eddy current testing to acceptance level E2/L2 in accordance with ISO 10893-2 or ASTM E309;

c) magnetic particle inspection in accordance with ISO 10893-5 or ASTM E709.

Page 61, Section 10.15.10 list, revise to read:

a) ultrasonic testing to acceptance level U3/L3 in accordance with ISO 10893-8 or ASTM E273 or ISO 10893-10 or ASTM E213;

b) flux leakage testing to acceptance level F3/L3 in accordance with ISO 10893-3 or ASTM E570;

c) eddy current testing to acceptance level E3/L3 in accordance with ISO 10893-2 or ASTM E309.

Page 61, Section 10.15.10, 6th paragraph, add the following after sentence:

When A.14 SR40 is specified on the purchase agreement for Group 1 and 2 products, the additional requirements of A.14 SR40 apply.

Page 62, Section 10.15.11, revise Title to read:

NDE of Coupling stock, accessory material, (except Grade C110) and pup joints

Page 62, Section 10.15.11 list, revise to read:

— ultrasonic testing in accordance with ISO 10893-10 or ASTM E213

— flux leakage testing in accordance with ISO 10893-3 or ASTM E570

— eddy current concentric coil testing in accordance with ISO 10893-2 or ASTM E309

— magnetic particle inspection in accordance with ISO 10893-5 or ASTM E709.

Page 62, Section 10.15.11 d), revise to read:

For API round thread pup joints in size designations listed in Table C.2 or Table E.2 in Group 1, Group 2 Grades L80 and Group 3, the required inspections, unless otherwise agreed upon between purchaser and manufacturer, are as specified in e).

Page 62, Section 10.15.12 list, revise to read:

— ultrasonic testing in accordance with ISO 10893-10 or ASTM E213

— flux leakage testing in accordance with ISO 10893-3 or ASTM E570

— eddy current concentric coil testing in accordance with ISO 10893-2 or ASTM E309

— magnetic particle inspection in accordance with ISO 10893-5 or ASTM E709.

Page 63, Section 10.15.12 b), revise 1st sentence to read:

Coupling stock containing imperfections may be given further evaluation in accordance with 10.15.15, except the maximum size of the non-surface-breaking imperfection specified in 8.13.1 d) shall be reduced to 32 mm^2 (0.05 in^2).

Page 63, Section 10.15.12 c), 2nd sentence, revise to read:

The reference indicator shall be a 6,4 mm (1/4 in) flat bottomed round hole from the inside surface as shown in Figure D.16 d.

Page 64, Section 10.15.16, 2nd paragraph, 1st sentence, revise to read:

When no imperfection is found in the area of the original indication and there is no explanation for the indication, then the product shall be rejected or, at the manufacturer's option, re-inspected full-body, full-length either using the same inspection method or using ultrasonic inspection methods.

Page 67, Section 11.1.9, revise to read:

Products manufactured in accordance with this edition of API 5CT during the period of overlap of application with the previous edition shall be identified by using either "0" as the overlap period designation rather than the quarter, or "00" as the overlap period designation rather than the month. The overlap period designation "0" or "00" applies to the pipe body characteristics and does not apply to changes in API Spec 5B.

Page 67, Section 11.2.4, revise Title to read:

Group 1 (except Grade R95) and Group 3

Page 68, Section 11.4.2, 1st paragraph, revise to read:

The following methods shall be used, as applicable.

Page 76, Section A.6.5.1, delete section and renumber subsequent sections.

Page 78, Section A.7.3, 1st paragraph, 2nd and 3rd sentences, revise to read:

If an impact test specimen fails to conform to the specified requirements, the manufacturer shall follow the re-test provisions of 10.7.8, 10.7.9 and 10.7.10 (as applicable). If a hardness test specimen fails to conform to the specified requirements, the manufacturer shall follow the re-test provisions of 10.6.14 to 10.6.19 (as applicable).

Page 82-83, Section A.10.2, revise subsection titles to read:

A.10.2.1 SR 16.2.1 General

A.10.2.2 SR 16.2.2 Specimen size

A.10.2.3 SR 16.2.3 Specimen allowance for outside diameter curvature

A.10.2.4 SR 16.2.4 Hierarchy of test specimens

A.10.2.5 SR 16.2.5 Alternative-size impact test specimens

A.10.2.6 SR 16.2.6 Absorbed energy requirement for sub-size specimens

Page 82, Section A.10.2.5, 1st sentence, revise to read:

At the manufacturer's option, alternative-size impact test specimens, listed in Table C.55 (SR16.3) or Table E.55 (SR16.3), may be used in lieu of the minimum size specified in the tables referenced in A.10.2.2 (SR16.2.2).

Page 84, Section A.10.6.3, 3rd paragraph, revise to read:

The test temperature shall be reduced as specified in A.10.6.5 SR16.6.5 for Grades H40, J55 and K55 when subsize test specimens are required.

Page 85, Section A.10.6.7, last sentence, revise to read:

The impact energy of each of the re-test specimens shall equal or exceed the specified minimum absorbed energy requirement or the product shall be rejected.

Page 85, Section A.10.6.8, 2nd sentence, revise to read:

If all the additional products tested conform to the requirements, then the lot shall be qualified except for the product that was initially rejected.

Page 88, Section A.13.1, 1st sentence, revise to read:

For each lot, as defined in 10.2, manufacturers shall carry out an ANSI-NACE TM0177:2005 Method D test with the test solution specified in A.13.3 SR39.3.

Page 91, Section B.2, 1st and 2nd sentences, revise to read:

The inspector representing the purchaser shall have unrestricted access, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which will concern the manufacturer of the products ordered. The manufacturer shall afford the inspector all reasonable facilities to satisfy the inspector that the product is being manufactured in accordance with this Standard.

Page 91, Section B.3, 2nd sentence, revise to read:

The purchaser may make any investigation necessary to ensure compliance by the manufacturer and may reject any product that does not comply with this Standard.

Page 92, Table C.1, Row Label 1 is "7", revise Column 4 to read:

25,89
30,06
34,67
39,14
43,60
47,92
52,23
56,10
63,84
69,35
74,85
80,21
85,42

Page 96, Table C.3, footnote b, revise to read:

Full-body, full-length normalized, normalized and tempered or quenched and tempered at the manufacturer's option or as specified on the purchase agreement (see 6.2.2).

Page 99, Table C.6, Columns 2, 3, and 4, Row "490" replace:

W *with* ≥

Page 99-100, Table C.6, revise to read as follows:

Row "480", Column K55/L80, replace	20	*with*	19
Row "420", Column J55, replace	24	*with*	23
Row "350", Column N80, replace	18	*with*	17
Row "290", Column M65, replace	20	*with*	19
Row "180", Column C110, replace	14	*with*	13
Row "70", Column Q125, replace	10	*with*	9.5

Page 108, Table C.16, Note 1, revise to read:

Critical thicknesses greater than shown in Table C.7 are not applicable for couplings with API threads and are shown here for information for special applications.

Page 109, Table C.17, Note 1, revise to read:

Critical thicknesses greater than shown in Table C.7 are not applicable for couplings with API threads and are shown here for information for special applications.

Page 113, Table C.22, Column 2, replace:

W *with* ≥

Page 113, Table C.22, footnote b, revise to read:

See A.6 SR11. Flattening shall be conducted until this distance or until 0,85 × D, whichever is less, without cracking at any location.

Page 116, Table C.23, footnote c, last sentence revise to read:

A mass correction factor of 0,989 shall be used.

Page 117, Table C.24, footnote c, last sentence revise to read:

A mass correction factor of 0,989 shall be used.

Page 118, Table C.25, footnote b, last sentence revise to read:

A mass correction factor of 0,989 shall be used.

Page 120, Table C.27, Row 2, replace:

Threaded and coupled tubing and casing used as tubing

with

Tubing

Page 120, Table C.27, Row 3, align range lengths with descriptions in Column 1.

Page 120, Table C.28, Column 1, replace:

W *with* ≥

u *with* ≤ *(three locations)*

Page 121, Table C.29, Column 4, revise Title to read and replace first two lines as follows:

Nominal linear mass, T&C

34,23 *with* 34,67

47,62 *with* 47,92

Page 122, Table C.32, revise to read as follows:

Row "7", Column 8, replace 8,39 *with* 10,88

Row "7", Column 9, replace 10,83 *with* 13,92

Page 122, Table C.33, revise to read as follows:

Row "7", Column 8, replace 10,54 *with* 13,98

Page 126, Table C.39, revise Title of columns 2 and 3 to read:

Material and heat treatment conditions

Page 128, Table C.41, Casing and tubing Row "4", Column 4 revise to read:

1 on each end of each length of pipe [see A.6 SR11]

Page 129, Table C.42, revise Title to read:

Summary of NDE methods for seamless pipe, coupling stock, the body of welded pipe and accessory material (in accordance with 10.15.11)

Page 132, Table C.48, revise Title of column 8 to read:

Coupling stock and accessory materials

Page 132, Table C.48, revise Column 2, Row 3, 3rd hyphen to delete:

or accessories

Page 133, Table C.48, Column 3, Row 13, add footnote h after << ….. >>, and add footnote h at bottom of table to read:

[h] See Table C.47 for thread type markings

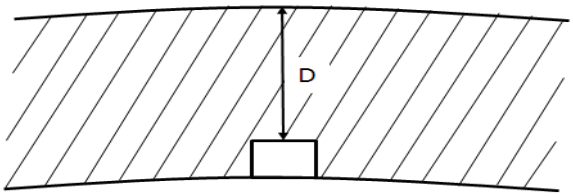
Page 152, Figure D.14, extend hooked end dimension to the upper end of the pipe, and not at its center.

Page 154, Figure D.15 e), switch "Stencil marking" and "Stamp marking" labels to the figures.

Page 155, Figure D.15, footnote c under "Key" first sentence, revise to read:

Date of manufacture: This example is for product manufactured in accordance with the current edition of API 5CT during the period of overlap with application (see 11.1.9) of the previous edition.

Page 157, Figure D.16 d), replace current figure with the following:



Page 161, Figure D.20 table, revise 1st Column title to read:

EU tubing size Label 1

Page 170, Figure D.29, revise labels in the figure as follows:

Blue seal-ring paint band	*with*	1
Grade or other paint band(s)	*with*	2

Page 171, Table E.1, Row Label 1 is "7", revise Column 4 to read:

17.40
20.20
23.30
26.30
29.30
32.20
35.10
37.70
42.90
46.60
50.30
53.90
57.40

Page 175, Table E.3, last two rows of Group 1, revise Heat treatment Column to read:

Q [d]
Q

Page 175, Table E.3, footnote b, revise to read:

Full-body, full-length normalized, normalized and tempered or quenched and tempered at the manufacturer's option or as specified on the purchase agreement (see 6.2.2).

Page 178-179, Table E.6, revise to read as follows:

Column C110, rows 0.670 to 0.560, replace 15 *with* 16 (12 lines)

Column C110, rows 0.480 to 0.400, replace 14 *with* 15 (9 lines)

Column C110, rows 0.330 to 0.280, replace 13 *with* 14 (6 lines)

Column C110, rows 0.220 to 0.190, replace 12 *with* 13 (4 lines)

Column C110, rows 0.150 to 0.130, replace 11 *with* 12 (3 lines)

Column C110, rows 0.090 to 0.080, replace 10 *with* 11 (2 lines)

Page 186, Table E.16, Note 1, revise to read:

Critical thicknesses greater than shown in Table E.7 are not applicable for couplings with API threads and are shown here for information for special applications.

Page 187, Table E.17, Note 1, revise to read:

Critical thicknesses greater than shown in Table E.7 are not applicable for couplings with API threads and are shown here for information for special applications.

Page 191, Table E.22, footnote b, revise to read:

See A.6 SR11. Flattening shall be conducted until this distance or until 0,85 × D, whichever is less, without cracking at any location

Page 194, Table E.23, footnote c, last sentence revise to read:

A mass correction factor of 0,989 shall be used.

Page 195, Table E.24, footnote c, last sentence revise to read:

A mass correction factor of 0,989 shall be used.

Page 196, Table E.25, footnote b, last sentence revise to read:

A mass correction factor of 0,989 shall be used.

Page 198, Table E.27, Row 2, replace:

Threaded and coupled tubing and casing used as tubing

with

Tubing

Page 198, Table E.27, Row 3, align range lengths with descriptions in Column 1.

Page 198, Table E.28, Column 1, replace:

W *with* ≥

u *with* ≤ *(three locations)*

Page 199, Table E.29, Column 4, revise Title to read and replace first two lines as follows:

Nominal linear mass, T&C

23.0 *with* 23.3

32.0 *with* 32.2

Page 200, Table E.32, revise to read as follows:

Row "7", Column 8, replace 18.49 *with* 23.98

Row "7", Column 9, replace 23.87 *with* 30.69

Page 200, Table E.33, revise to read as follows:

Row "7", Column 8, replace 23.24 *with* 30.82

Page 206, Table E.41, Casing and tubing Row "4", Column 4 revise to read:

1 on each end of each length of pipe [see A.6 SR11]

Page 210, Table E.48, revise Title of column 8 to read:

Coupling stock and accessory materials

Page 210, Table E.48, revise Column 2, Row 3, 3rd hyphen to delete:

or accessories

Page 211, Table E.48, Column 3, Row 13, add footnote h after << ... >>, and add footnote h at bottom of table to read:

[h] See Table E.47 for thread type markings

Page 223, Section F.4.1.2, revise 1st sentence to read:

For all manufacturers except threaders, the marking instructions in this annex, except those in F.4.6, are applicable.

Page 223, Section F.4.1.9, revise to read:

Products manufactured in accordance with this edition of API 5CT during the period of overlap of application with the previous edition shall be identified by using either "0" as the overlap period designation rather than the quarter, or "00" as the overlap period designation rather than the month. The overlap period designation “0” or “00” applies to the pipe body characteristics and does not apply to changes in API Spec 5B.

Page 224, Section F.4.2.1, 2nd paragraph revise 1st sentence to read:

After stamp marking, group 2 and group 4 products can require subsequent heat treatment as specified in F.4.2.5.

Page 224, Section F.4.2.4, revise to read:

When specified on the purchase agreement, products shall be stamped by one or more of the methods in F.4.2.1 at the option of the manufacturer.

Page 224, Section F.4.2.5, revise 1st sentence to read:

When specified on the purchase agreement, products shall be stamped by one or more of the methods in F.4.2.1 at the option of the manufacturer.

Page 225, Section F.4.4.2, 1st paragraph revise to read:

The following methods shall be used, as applicable.

Page 226, Section F.4.4.3, revise to read:

For all grades except Grades L80 9Cr and L80 13Cr, paint the entire outside surface of the coupling, including the appropriate colour bands.

For Grades L80 9Cr and L80 13Cr, apply only the appropriate colour bands with a band width of 12,7 mm (½ in) to the outside surface of the coupling..

Page 226, Section F.4.4.4, revise to read:

For all grades except for Grades L80 9Cr and L80 13Cr, paint the coupling using the appropriate colours and also paint a black band around the centre.

For Grades L80 9Cr and L80 13Cr, apply only the appropriate colour bands and a black band around the centre with a band width of 12,7 mm (½ in).

Page 226, Section F.4.4.5, revise title and section to read as follows:

Product shorter than 1,8 m (6 ft) in length

For all grades except for Grades L80 9Cr and L80 13Cr, paint the entire outside surface except the threads including the appropriate colour bands.

For Grades L80 9Cr and L80 13Cr, apply only the appropriate colour bands with a band of 12,7 mm (½ in) to the outside surface.

Page 226, Section F.4.6, 1st paragraph, revise to read:

Pipe threaded by a facility other than the original pipe manufacturer shall be identified by a stamp or stencil consistent with F.4.1, F.4.2 and F.4.3 adjacent to the threads with the name or mark of the threader, the specification mark, and size and type of thread as listed in F.4.5 and Table C.47 or Table E.47.

Page 238, Section G.9.3, Equation G.32, delete the following:

YS_{m} is the yield strength, expressed in megapascals;

$d_{1\mathrm{m}}$ is the diameter, expressed in millimetres, at the root of the coupling thread at the plane of the end of the pipe in the power-tight position;

Page 244, Section H.18.1.5, 1st paragraph, revise to read:

All pipe shall be inspected for the detection of both longitudinal and transverse imperfections on the outside and inside surfaces to acceptance level L2 in accordance with ISO 10893-10 or ASTM E213 (longitudinal) and ISO 10893-10 or ASTM E213 (transverse).

Page 245, Section H.18.4.2, 1st sentence, revise to read:

Coupling stock containing imperfections may be given further evaluation in accordance with 10.15.15, except the maximum size of the non-surface-breaking imperfection specified in 8.13.1 d) shall be reduced to 32 mm^2 (0.05 in^2).

Page 253, Section J.3.1.5, revise to read:

NDE for longitudinal and transverse, internal and external defects to acceptance level L3 (no MPI) [H.18.1.2].

Page 254, Section J.4.2.6, delete line.

Page 255, Section J.6.2.1, revise to read:

SSC test: for ANSI-NACE TM0177-2005 Method A, demonstrate a threshold stress of 80 % of the specified minimum yield stress in a test solution with pH 3,5 and a hydrogen sulfide partial pressure of 0,1 bar (1.5 psi) [H.9.2].

Page 256, Section J.7.2.3, revise to read:

SSC test: for ANSI-NACE TM0177-2005 Method A, test three pipes per heat at an applied stress of 90 % of the specified minimum yield stress [H.9.1].

Specification for Casing and Tubing

Upstream Segment

API SPECIFICATION 5CT
NINTH EDITION, JULY 2011

EFFECTIVE DATE: JANUARY 1, 2012

ERRATA 1, SEPTEMBER 2012
ERRATA 2, OCTOBER 2016

energy API

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Shall: As used in a standard, “shall” denotes a minimum requirement in order to conform to the specification.

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Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

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Introduction

This Standard is based on the Eighth edition of API Spec 5CT.

Users of this Standard are advised that further or differing requirements can be needed for individual applications. This Standard is not intended to inhibit a vendor from offering, or the purchaser from accepting, alternative equipment or engineering solutions for the individual application. This can be particularly applicable where there is innovative or developing technology. Where an alternative is offered, it is advisable that the vendor identify any variations from this Standard and provide details.

This Standard includes requirements of various nature. These are identified by the use of certain verbal forms:

— SHALL is used to indicate that a provision is MANDATORY;

— SHOULD is used to indicate that a provision is not mandatory, but RECOMMENDED as good practice;

— MAY is used to indicate that a provision is OPTIONAL.

Details of the major changes (additions, modifications and deletions) agreed by the committee, and which affect the performance of the products or the technical requirements applicable to the products, are provided for information in Annex L and are indicated in this Standard by the use of grey shading. Grey shading is also used to indicate editorial changes. Where deletions, but no other changes, have been made, vertical bars are used in the margin adjacent to the applicable line or at each side of a cell in a table. Where a complete line or paragraph has been deleted, margin bars next to a blank line are used. While efforts have been made to ensure the accuracy of the changes indicated, the user of this Standard is advised to consider the total technical content and not only the changes identified.

Details of Errata 1, September 2012 and Errata 2, October 2016 are indicated in this standard by the use of the symbols “12►” and “16►”, respectively.

The user is ultimately responsible for recognizing any differences between this edition and the previous edition of this Standard.

Petroleum and natural gas industries — Steel pipes for use as casing or tubing for wells

1 Scope

1.1 This Standard specifies the technical delivery conditions for steel pipes (casing, tubing and pup joints), coupling stock, coupling material and accessory material and establishes requirements for three Product Specification Levels (PSL-1, PSL-2, PSL-3). The requirements for PSL-1 are the basis of this Standard. The requirements that define different levels of standard technical requirements for PSL-2 and PSL-3, for all Grades except H-40, L-80 9Cr and C110, are contained in Annex H.

For pipes covered by this Standard, the sizes, masses and wall thicknesses as well as grades and applicable end-finishes are listed in Tables C.1 and C.2 and Tables E.1 and E.2.

By agreement between the purchaser and manufacturer, this Standard can also be applied to other plain-end pipe sizes and wall thicknesses.

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

— short round thread casing (SC);

— long round thread casing (LC);

— buttress thread casing (BC);

— non-upset tubing (NU);

— external upset tubing (EU);

12► — integral tubing (IJ).

For such connections, this Standard specifies the technical delivery conditions for couplings and thread protection. Supplementary requirements that can optionally be agreed for enhanced leak resistance connections (LC) are given in A.11 SR22.

This Standard can also be applied to tubulars with connections not covered by API standards.

1.2 The four groups of products to which this Standard is applicable include the following grades of pipe:

— Group 1: All casing and tubing in Grades H, J, K, N and R;

— Group 2: All casing and tubing in Grades C, L, M and T;

— Group 3: All casing and tubing in Grade P;

— Group 4: All casing in Grade Q.

1.3 Casing sizes larger than Label 1: 4-1/2 but smaller than Label 1: 10-3/4 can be specified by the purchaser to be used in tubing service, see Tables C.1, C.23, C.27 and C.28 or Tables E.1, E.23, E.27 and E.28.

1.4 Supplementary requirements that can optionally be agreed between purchaser and manufacturer for non-destructive examination, fully machined coupling blanks, upset casing, electric-welded casing, tubing and pup joints, impact testing, seal ring couplings, test certificates, tensile testing and sulfide stress cracking testing are given in Annex A.

1.5 This Standard is not applicable to threading requirements.

NOTE Dimensional requirements on threads and thread gauges, stipulations on gauging practice, gauge specifications, as well as instruments and methods for inspection of threads are given in API Spec 5B.

2 Conformance

2.1 Dual referencing of normative references

In the interests of world-wide application of this Standard, the technical committee has decided, after detailed technical analysis, that certain of the normative documents listed in Clause 3 and prepared bythe technical committee are interchangeable in the context of the relevant requirement with the relevant document prepared by the American Petroleum Institute (API), the American Society for Testing and Materials (ASTM) or the American National Standards Institute (ANSI). These latter documents are cited in the running text following the ISO reference and preceded by “or”, for example “ISO XXXX or ASTM YYYY”. Application of an alternative normative document cited in this manner will lead to technical results different from the use of the preceding ISO reference. However, both results are acceptable and these documents are thus considered interchangeable in practice.

2.2 Units of measurement

In this Standard, data are expressed in both the International System (SI) of units and the United States Customary (USC) system of units. For a specific order item, it is intended that only one system of units be used, without combining data expressed in the other system.

Products manufactured to specifications expressed in either of these unit systems shall be considered equivalent and totally interchangeable. Consequently, compliance with the requirements of this Standard as expressed in one system provides compliance with requirements expressed in the other system.

For data expressed in the SI, a comma is used as the decimal separator and a space as the thousands separator. For data expressed in the USC system, a dot (on the line) is used as the decimal separator and a space as the thousands separator.

In the text, data in SI units are followed by data in USC units in parentheses.

Separate tables for data expressed in SI units and USC units are given in Annex C and Annex E respectively.

Figures are contained in Annex D and express data in both SI and USC units.