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## Addendum 1

*Section 2 (Normative References): The following reference shall be added:*

ISO 13665, *Seamless and welded steel tubes for pressure purposes—Magnetic particle inspection of the tube body for the detection of surface imperfections*

*3.1.27: The definition shall be changed to the following:*

Piece of pipe that may be plain-end, threaded, or threaded and coupled, that is in accordance with the length requirements in this standard.

*3.1.43: The definition shall be changed to the following:*

Threads with thread form and features, manufacturing specifications, dimensions, connection make-up and performance properties which are beyond the scope of this standard or types of threaded end-finish not covered by Tables C.1/E.1 and C.2/E.2.

*Table 1: The table shall be changed as shown by the red box.*

Requirement	Reference
Standard	API 5CT
Quantity	
Type of pipe or couplings	
Casing:	
Threaded or plain-end	8.12.1, Table C.1 or Table E.1
Type of connection: SC, LC or BC, or other connection	8.12.2, 8.12.6, Table C.1 or Table E.1
With or without couplings	8.12.2, Table C.1 or Table E.1
Special clearance couplings—BC	9.6, Tables C.1, C.33 or Tables E.1, E.33
Special clearance couplings with special bevel—BC	9.6
Label 1 or specified outside diameter	Table C.1 or Table E.1
Label 2 or specified mass or wall thickness	Table C.1 or Table E.1
Grade and type where applicable	Tables C.1, C.4 or Tables E.1, E.4
Length	8.6, Table C.27 or Table E.27

Table 3: The rows indicated by the red boxes shall be added to the table:

Requirement	Reference
Upset—Grade C110	6.1
Cold rotary straightening—Grade Q125	6.3.6
Statistical tensile testing	7.2.4, K.11 (SR 38)
Statistical impact testing	7.3.8, K.7 (SR 12)
Impact of non-heat-treated product	7.5.1, K.9 (SR 16)
Alternative hardenability requirement for products with a wall thickness of 30 mm (1.181 in.) or larger	7.10.2
Sulfide stress cracking test Method D requirement for Grade C110 product over 50.8 mm (2.0 in.) wall thickness	7.14.5
Length other than specified in Table C.27 or Table E.27	8.6
Thread and storage compound	8.14
Waiving NDE of Grades H40, J55, K55 couplings	9.11.3
Coupling thread surface treatment Grade Q125 only	9.14
Reduced section tensile specimens Grade Q125	10.4.6
Additional hardness testing	10.6.2
Alternative hydrostatic test pressures	10.12.3
Plain-end Grade Q125 casing hydrostatic testing	10.12.2
Non-destructive examination	10.15, K.2 (SR 1), K.3 (SR 2), K.5 (SR 10), K.6 (SR 11)
Marking requirements	11
Thread protectors	12.2
Include coupling certification with pipe certification	13.3 s)
Special wall thickness with S, L, and B end-finish	Tables C.1/E.1, footnote e; see API 5B for acceptable wall thickness ranges
Coupling blanks Grade Q125 only	9.4.2, K.4 (SR 9)
Upset casing Grade Q125 only	K.5 (SR 10)
Electric-weld casing and pup joints Grades H40, J55, K55, N80 (all types), L80 Type 1, R95	K.13 (SR 40)
Electric-weld casing and pup joints Grades P110 and Q125	6.1, K.6 (SR 11)
Alternative F factor for statistical impact testing	K.7.2 (SR 12.2)
Special size and wall thickness plain-end pipe	8.2
Enhanced leak resistance LC connections	K.10 (SR 22)
Supplemental inspection when hydrostatic test pressure is limited to 69.0 MPa (10,000 psi)	K.14.1 (SR 41.1), K.14.2 (SR 41.2)

Table 4: The table shall be changed as indicated by the red box:

Requirement	Reference
Standard	API 5CT
Quantity	
Type of pipe or couplings	
Tubing:	
Non-upset, external-upset or integral joint	Table C.2 or Table E.2
Threaded, plain-end, or other connection	8.12
With or without couplings	8.12
Regular couplings with special bevel NU, EU	9.9, Tables C.24, C.34 and C.35 or Tables E.24, E.34 and E.35
Special clearance couplings—EU	9.6, Tables C.24, C.35 or Tables E.24 and E.35
Label 1 or specified outside diameter	Table C.2 or Table E.2
Label 2 or specified mass or wall thickness	Table C.2 or Table E.2
Grade and type, where applicable	Table C.2 or Table E.2, Table C.4 or Table E.4
Length	8.6, Table C.27 or Table E.27

Table 6: The rows indicated by the red boxes shall be added to the table:

Requirement	Reference
Statistical tensile test	7.2.4, K.11 (SR 38)
Statistical impact testing	7.3.8, K.7 (SR 12)
Impact testing of non-heat-treated product	7.5.1, K.9 (SR 16)
Length other than specified in Table C.27 or Table E.27	8.6
Thread and storage compound	8.14
Waiving NDE of Grades H40, J55, K55 couplings	9.11.3
Additional hardness testing	10.6.2
Alternative hydrostatic test pressures	10.12.3
Non-destructive examination	10.15, K.2 (SR 1), K.3 (SR 2), K.5 (SR 10), and K.6 (SR 11)
Marking requirements	11
Thread protectors	12.2
Include coupling certification with pipe certification	13.3 s)
Electric-weld tubing and pup joints—Grades H40, J55, K55, N80 (all types), L80 Type 1, R95	K.13 (SR 40)
Supplemental inspection when hydrostatic test pressure is limited to 69.0 MPa (10,000 psi)	K.14.1 (SR 41.1), K.14.2 (SR 41.2)
Electric-weld tubing and pup joints—Grade P110	K.6 (SR 11)
Special size and wall thickness	8.2
Casing used for tubing	8.2, Table C.27 or Table E.27

5.4.3: *The following section shall be added:*

**5.4.3** The following may be agreed between purchaser and manufacturer regarding coupling stock and material, and accessory material:

- sulfide stress cracking test Method D requirement for Grade C110 product over 50.8 mm (2.0 in.) wall thickness according to 7.14.5.

7.7.1: *Item a), subitem 3) shall be changed to the following:*

- 3) For Grade C110, any mean hardness number not exceeding 29.0 HRC is acceptable. If any hardness number from a single indentation exceeds 31.0 HRC the length or piece shall be rejected. Products with mean hardness numbers between 29.0 HRC and 31.0 HRC shall be retested.

7.7.1: *The second paragraph of item b) shall be changed to the following:*

For Grade C110, if the Brinell or Rockwell C-scale hardness number does not exceed 279 HBW or 29.0 HRC respectively, then the length or piece is acceptable. If any of the hardness numbers are over 279 HBW or 29.0 HRC two additional indentations may be made in the immediate area. If either of the second test hardness numbers exceeds 279 HBW or 29.0 HRC the piece shall be rejected.

7.14.3: *Item a) shall be changed to the following:*

- a) for all test methods, for Grades C90 and T95 a mean hardness of 24.4 HRC or higher or for Grade C110 a mean hardness of 28.0 HRC or higher, or

7.14.5: *In item c), subitem 1), the following paragraph shall be added:*

For wall thickness greater than 50.8 mm (2.0 in.) for Grade C110, the mean value of at least three valid test specimens is 26.4 MPa-m<sup>1/2</sup> (24.0 ksi-in.<sup>1/2</sup>) unless otherwise agreed between the purchaser and manufacturer.

7.14.5: *In item c), subitem 3), the following paragraph shall be added:*

For wall thickness greater than 50.8 mm (2.0 in.) for Grade C110, the minimum individual valid specimen value is 23.1 MPa-m<sup>1/2</sup> (21.0 ksi-in.<sup>1/2</sup>) unless otherwise agreed between the purchaser and manufacturer.

8.2: *The section shall be changed to the following:*

Pipe shall be furnished in the sizes, wall thicknesses and masses (as shown in Tables C.23 to C.26 inclusive, or Tables E.23 to E.26 inclusive) as specified in the purchase agreement. Other plain-end pipe sizes and wall thicknesses may be furnished by agreement between purchaser and manufacturer. By agreement between purchaser and manufacturer, casing with S, L, or B end-finishes may be furnished with intermediate wall thicknesses within the particular S, L, or B series of wall thicknesses and grade for the applicable Label 1 size specified in Table C.1 or Table E.1. See API 5B for acceptable pipe wall thickness ranges.

Coupling stock, coupling material, and accessory material shall be furnished in dimensions specified in the purchase agreement or, in the case of coupling material, the dimensions shall be specified in the manufacturer's internal requirements. Coupling stock and coupling material outside diameter and wall thickness combinations shall exclude those in Tables C.1 and C.2, or Tables E.1 and E.2. Dimensions shown without tolerances are related to the basis for design and are not subject to measurement to determine acceptance or rejection of product.

8.5: Equation (5) shall be changed to the following:

$$W_L = [(w_{pe})(L_{ef}) + (e_m)](k_m)$$

8.5. In the key for Equation (5), the  $k_m$  definition shall be changed as indicated in the red box:

$k_m$  is the mass correction factor: 1.000 for carbon steels; 0.989 for martensitic chromium steels;

8.6: The first paragraph shall be changed to the following:

Unless otherwise agreed between the purchaser and manufacturer, casing, tubing and pup joints shall be furnished in lengths conforming to Table C.27 or Table E.27. The length of API couplings shall be as specified in Tables C.32 to C.35, or Tables E.32 to E.35 as applicable. The length of coupling stock, coupling material and accessory material shall be as specified in the purchase agreement or, in the case of coupling material and accessory material, the length shall be specified in the manufacturer's internal requirements. The length of each finished product shall be determined for conformance to length requirements. Length determination shall be in meters and hundredths of a meter (feet and tenths of a foot).

8.10: The first paragraph shall be changed to the following:

Each length of pipe shall be drift-tested throughout its entire length. Drift testing may be done plain end or in threaded condition. For API threaded products and SF products with couplings, if pipe has been drift-tested full-length before coupling installation, it shall also be drift-tested for a minimum distance of 0.6 m (24 in.) from the coupled end on casing and 1.1 m (42 in.) from the coupled end on tubing after coupling power-tight make-up and include any area potentially affected by the make-up equipment. Drift dimensions (length and diameter) shall comply with Table C.28 or Table E.28.

8.12.6: The following paragraph shall be added at the end of the section:

When applying API 5B-compliant thread to products not listed in Tables C.1/E.1 and C.2/E.2, the product shall be marked as specified in 11.5.2.

10.1: The first paragraph shall be changed to the following:

The manufacturer shall determine and document the appropriate calibration and verification frequency in order to be able to certify that all products conform to the requirements of this standard. When the calibration or verification frequency is based on a month, the maximum interval shall be up to and including the last day in the month in which the calibration is due.

10.2.1: The section header shall be changed to the following:

**10.2.1 Grades H40, J55, K55, L80 Type 1, N80 (All Types), R95, and P110—Coupling Stock, Coupling Material, Accessory Material, and Pipe (except coupling blanks, pup joints, or accessory material heat-treated after cutting to blank or individual length)**

10.2.1: The following shall be added after the first paragraph:

When different heats are grouped according to a documented procedure, at a minimum, the procedure shall ensure the following requirements are met.

a) The identification of the grouped heats shall be unique and different from the heats grouped.

- b) Product from each heat that is grouped shall have been previously processed and demonstrated to meet this specification.
- c) Each heat that is grouped shall have a chemistry that meets the documented chemistry limits of the previously established process validation.
- d) Traceability to each of the original heats grouped shall be documented.
- e) A grouped set of heats shall not be grouped with another grouped set of heats.
- f) Grouped heats involving grades that do not require heat treatment in accordance with Table C.3/E.3 and are grouped prior to manufacture shall be produced using the same control parameters previously used for product from every heat within the group.
- g) Grouped heats that will be further heat treated shall be processed with the same validated heat treatment parameters previously used for product from every heat within the group.

10.2.2: The section header shall be changed to the following:

**10.2.2 Grades L80 9Cr, L80 13Cr, C90, T95, C110, and Q125—Coupling Stock, Coupling Material, Accessory Material, and Pipe (except coupling blanks, pup joints, or accessory material heat-treated after cutting to blank or individual length)**

*10.4.3: The third paragraph shall be changed to the following:*

The lengths for testing shall be selected at random and, when more than one test is required, the selection procedures shall provide samples representing the start and end of the heat-treat cycle (as applicable) and front and back ends of the tubes. When more than one test is required, the test specimens shall be from different lengths, except for upset pipe or a single piece lot where the test specimens may be taken from both ends of one length.

*10.4.4: The first paragraph shall be changed to the following:*

The frequency of testing is defined for coupling stock, coupling material and coupling blanks in Table C.38 or Table E.38 and for pup joints and accessory material in Table C.39 or Table E.39. When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of one length.

*10.6.2: The first paragraph shall be changed to the following:*

The frequency of hardness testing for all products is specified in Table C.40 or Table E.40. When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of one length.

*10.6.10: The 15<sup>th</sup> and 16<sup>th</sup> paragraphs shall be changed to the following:*

If two or more hardness indentations at a location (same outside-wall, mid-wall or inside-wall in a quadrant) are greater than 20 HRC, and if the difference between the highest and lowest indentations at that location is greater than 2.5 HRC, then three additional indentations in the same location shall be taken. In such case, the mean hardness number shall be based on the three additional indentations. The test report shall indicate that additional indentations were made and the original test data shall be available upon request. Additional indentations are not allowed if any Rockwell hardness number is over 27.0 HRC for Grades C90 or T95 or over 31.0 HRC for Grade C110.

The through-wall hardness test is usually made using the Rockwell C-scale. It is acceptable to use the Rockwell C-scale on materials having a hardness below 20 HRC. Care should be exercised when evaluating hardness below 20 HRC because of a potential lack of precision, but nevertheless these results may be used to determine hardness. The use of the Rockwell B-scale on materials having a hardness below 20 HRC is at the option of the manufacturer or as specified in the purchase agreement. Rockwell hardness numbers and mean hardness numbers shall be reported in Rockwell C, from actual or converted numbers, to the first or second decimal place.

*10.6.13: The first paragraph shall be changed to the following:*

Indirect verification of hardness testing machines shall be performed at least once every 12 months and after a direct verification has been performed, in accordance with the procedures in ISO 6506-2 or ASTM E10 for Brinell hardness test machines, or ISO 6508-2 or ASTM E18 for Rockwell hardness test machines.

*10.6.13: The third paragraph shall be changed to the following:*

The indenter should be directly verified at least every 24 months. HRC indenters shall be certified by the manufacturer for performance error (deviation) with respect to a more accurate indenter (e.g. reference indenter with less error) and standardized test blocks in the range being tested. HRC indenters shall have a maximum performance error of  $\pm 0.4$  HRC.

*10.6.15: The second paragraph shall be changed to the following:*

For Grade C110, if any mean hardness number falls between 29.0 HRC and 31.0 HRC inclusive, three additional indentations shall be made in the immediate area to determine a new mean hardness number. If the new mean hardness number does not exceed 29.0 HRC, the piece shall be accepted. If the new mean hardness number exceeds 29.0 HRC, the piece shall be rejected.

*10.12.1: The fourth paragraph shall be changed to the following:*

The tester shall be equipped with devices for assuring that the specified test pressure and time interval requirements are met. The test pressure-measuring device shall be calibrated by means of a deadweight tester, or equivalent. For mechanical pressure devices (e.g. Bourdon tube and dial readout), the maximum calibration interval shall be six months. For electronic pressure devices (i.e. pressure transducers), the maximum calibration interval shall be 12 months. Calibration and verification records retention shall be as given in 13.4.

*10.12.3: In the equation key after Equation (6), the definition of  $f$  shall be changed to the following:*

$f$  is a factor:

- 0.6 for Grades H40, J55, and K55 larger than Label 1:  $9 \frac{5}{8}$
- 0.8 for Grades H40, J55, and K55 less than or equal to Label 1:  $9 \frac{5}{8}$
- 0.8 for all other grades and sizes;

*10.12.3: The second, third, and fourth paragraphs shall be deleted and replaced with the following:*

a) By agreement between purchaser and manufacturer, an alternative test pressure may be used.

Alternative test pressures for Grades H40, J55, and K55 in sizes larger than Label 1:  $9 \frac{5}{8}$  are calculated using a factor  $f$  of 0.8.

- b) A test pressure lower than the calculated value is allowed under the following conditions.
- 1) The calculated test pressure value exceeds 69.0 MPa (10,000 psi).
    - i) In this situation, the test pressure shall be at least 69.0 MPa (10,000 psi).
    - ii) By agreement between purchaser and manufacturer, an alternative test pressure greater than 69.0 MPa (10,000 psi) shall apply or the provisions of K.14 (SR 41.1 or SR 41.2) shall apply.
  - 2) The test equipment is physically limited.
    - i) The manufacturer shall have a documented design basis to establish the physical limitations of the hydrostatic test equipment. If the calculated test pressure (based on Equation 6) is greater than the physical capability of the hydrostatic test equipment, the manufacturer, upon agreement with the purchaser, shall use a test pressure equal to the physical capability of the test equipment.
    - ii) The hydrostatic test equipment capability may be less than 20.5 MPa (3000 psi) only for those products where the calculated test pressure is less than 20.5 MPa (3000 psi).
  - 3) The pipe is threaded and coupled, and a lower pressure is required to avoid leakage due to insufficient coupling strength or interface pressure between pipe and coupling threads:  
  
The lower pressure shall be calculated for threaded and coupled pipe, as specified in API 5C3 and ISO 10400.

NOTE If the calculated hydrostatic test pressure would exceed the contact pressure of the connector, hydrostatic test may be performed in plain end condition or without the coupling installed.

*10.15.6: The first paragraph and items a), b), and c) shall be changed to the following:*

All pipe shall be inspected for the detection of imperfections on the outside and inside surfaces by one or more of the following methods:

- a) ultrasonic testing to acceptance level as specified in Table C.43 or Table E.43 in accordance with ISO 10893-10 or ASTM E213;
- b) flux leakage testing to acceptance level as specified in Table C.43 or Table E.43 in accordance with ISO 10893-3 or ASTM E570;
- c) eddy current concentric coil testing to acceptance level as specified in Table C.43 or Table E.43 in accordance with ISO 10893-2 or ASTM E309;

*10.15.11.1: The first paragraph and items a), b), and c) shall be changed to the following:*

**10.15.11.1** When NDE is required for coupling stock or accessory material, except Grade C110, according to Table C.42 or Table E.42, the inspection shall be for the detection of imperfections on the outside surface by one or more of the following methods:

- a) ultrasonic testing to acceptance level as specified in Table C.43 or Table E.43 in accordance with ISO 10893-10 or ASTM E213;
- b) flux leakage testing to acceptance level as specified in Table C.43 or Table E.43 in accordance with ISO 10893-3 or ASTM E570;



- c) eddy current concentric coil testing to acceptance level as specified in Table C.43 or Table E.43 in accordance with ISO 10893-2 or ASTM E309;

*10.15.12.1: The first paragraph and items a), b), and c) shall be changed to the following:*

All coupling stock and accessory material shall be inspected for the detection of imperfections on the outside and inside surfaces by one or more of the following methods:

- a) ultrasonic testing to acceptance level as specified in Table C.43 or Table E.43 in accordance with ISO 10893-10 or ASTM E213;
- b) flux leakage testing to acceptance level as specified in Table C.43 or Table E.43 in accordance with ISO 10893-3 or ASTM E570;
- c) eddy current concentric coil testing to acceptance level as specified in Table C.43 or Table E.43 in accordance with ISO 10893-2 or ASTM E309;

*10.15.16: The second paragraph shall be changed to the following:*

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 option of the manufacturer, reinspected full-body, full-length, as required by Tables C.42/E.42 and 10.15.10 and applicable supplementary requirements, either using the same inspection method or using ultrasonic inspection methods. At the manufacturer's option, the inspection equipment shall be adjusted either to the same sensitivity level as that used to perform the original inspection or to a reduced sensitivity that meets the specified requirements.

*11.1.4: The section shall be changed to the following:*

**11.1.4** Products shall be marked by stencilling, or a combination of stencilling and stamping, at the option of the manufacturer, as stipulated, with three exceptions:

- a) by agreement between purchaser and manufacturer, stamping can be required, in which case a combination of stamping and stencil marking shall be used,
- b) at the option of the manufacturer, hot-rolled or hot-stamped markings on pipe and couplings may be substituted for die-stamped markings and are permitted at intervals along the length, and
- c) Alternative systems to stenciling may be used. The system shall mark all the information required for a paint stencil in Table C.48 or Table E.48. If the alternative system has the potential to modify the mechanical or corrosion properties of the material on the applied surfaces, process control parameters shall be validated through a documented procedure ensuring that on the underlying surface, the cracking resistance for sour service and the surface hardness (as in 7.7) are maintained and defects (as in 8.13) were not created.

*11.1.8: The section shall be changed to the following:*

**11.1.8** The date of manufacture is defined for marking purposes as the first two digits representing the month and the last two digits representing the year with a hyphen (dash) or slash in between (e.g., 05-12 or 05/12 for May 2012).

*11.1.9: The section shall be changed to the following:*

**11.1.9** 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 including the edition number after the manufacture date separated by a hyphen (dash) or slash (e.g., 10<sup>th</sup> Edition during 9<sup>th</sup> Edition

applicability, 05-19-10ED or 05/19/10ED for 10<sup>th</sup> Edition). Once the new edition is effective, marking of the edition is at the manufacturer's discretion. The edition marking applies to the pipe body characteristics and does not apply to changes in API 5B.

11.2.5: In item b), subitems 1), 2), and 3) shall be replaced by the following:

- 1) when the stamp markings are removed by cropping or by grinding, machining, threading to a depth not less than twice the depth of the stamping, and
- 2) by agreement between purchaser and manufacturer, the stamp marks may be left in the product.

11.2.6: The second, third, and fourth paragraphs shall be changed to the following:

For Grades H40, J55, K55, N80 (all types), and P110, the triangle shall be stamped by method 2, 3, 4, or 5 only.

For Grades C90, T95, and Q125, the triangle shall be stamped by method 3 only.

For Grades R95 and L80 (all types), the triangle shall be stamped by method 3 or 4 only.

11.5.2: The following paragraph shall be added at the end of the section:

When applying API 5B-compliant thread to products not listed in Tables C.1/E.1 and C.2/E.2, the product shall be marked as "SF" and the API thread designator (as shown in Table C.47/E.47) placed after the API marking sequence specified in Tables C.48/E.48 or C.61/E.61 (see also 11.1.10).

Table C.1: The table shall change as indicated by the red box:

Labels <sup>a</sup>		Outside Diameter	Nominal Linear Mass <sup>b,c</sup> T&C	Wall Thickness	Type of End-finish <sup>d</sup>							
1	2				D mm	kg/m	t mm	H40	J55 K55	L80 R95	N80 Type 1, Q	C90 T95
1	2	3	4	5	6	7	8	9	10	11	12	13
4 1/2	9.50	114.30	14.38	5.21	PS	PS	—	—	—	—	—	—
4 1/2	10.50	114.30	15.73	5.69	—	PSB	—	—	—	—	—	—
4 1/2	11.60	114.30	17.38	6.35	—	PSLB	PLB	PLB	PLB	P	PLB	—
4 1/2	13.50	114.30	19.87	7.37	—	—	PLB	PLB	PLB	P	PLB	—
4 1/2	15.10	114.30	22.69	8.56	—	—	—	—	—	—	PLB	PLB
5	11.50	127.00	17.19	5.59	—	PS	—	—	—	—	—	—
5	13.00	127.00	19.69	6.43	—	PSLB	—	—	—	—	—	—
5	15.00	127.00	22.69	7.52	—	PSLB	PLB	PLB	PLB	P	PLB	—
5	18.00	127.00	27.19	9.19	—	—	PLB	PLB	PLB	P	PLB	PLB

Table C.1: Footnote "e" shall be added as indicated by the red boxes:

Labels	Outside Diameter	Nominal Linear Mass <sup>b,c</sup> T&C	Wall Thickness	Type of End-finish <sup>d, e</sup>
...				

<sup>a</sup> Labels are for information and assistance in ordering.

<sup>b</sup> Nominal linear masses (Column 4) are shown for information only.

<sup>c</sup> The densities of martensitic chromium steels (L80 Types 9Cr and 13Cr) are different from carbon steels; The masses shown are therefore not accurate for martensitic chromium steels; A mass correction factor of 0.989 may be used.

<sup>d</sup> Buttress casing is available with regular, special clearance couplings or special clearance couplings with special bevel.

<sup>e</sup> For casing with S, L, B connections, intermediate wall thicknesses are allowed in accordance with 5.2.3 and 8.2 and API 5B.

Table C.4: The table shall change as indicated by the red box:

Grade	Type	C		Mn		Mo		Cr		Ni	Cu	P	S	Si
		min	max	min	max	min	max	min	max	max	max	max	max	max
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
...														
Q125	1	—	0.35		1.35	—	0.85	—	1.50	—	—	0.020	0.010	—

Table C.5: The table will change as indicated by the red boxes:

Grade	Type	Total Elongation Under Load %	Yield Strength MPa		Tensile Strength min MPa	Hardness <sup>a,c</sup> max		Specified Wall Thickness mm	Allowable Hardness Variation <sup>b</sup> HRC
			min	max		HRC	HBW		
1	2	3	4	5	6	7	8	9	10
...									
C110	—	0.7	758	828	793	29.0	279	≤12.70 12.71 to 19.04 19.05 to 25.39 ≥ 25.40	3.0 4.0 5.0 6.0

Table C.25: The footnotes shall be changed as indicated by the red boxes:

<sup>a</sup> Labels are for information and assistance in ordering.
<sup>b</sup> The densities of martensitic chromium steels (L80 9Cr and 13Cr) are different from carbon steels; The masses shown are therefore not accurate for chromium steels; A mass correction factor of 0.989 shall be used.
<sup>c</sup> The minimum outside diameter of upset $D_4$ is limited by the minimum length of full-crest threads. See API 5B.
<sup>d</sup> For pup joints only, the length tolerance on $L_{ej}$ is +101.6 mm to -25.4 mm; The length on $L_b$ may be 101.6 mm longer than specified.
<sup>e</sup> For extended-length upsets on external upset tubing, add 25.4 mm to the dimensions in Columns 6, 7, and 8.

Table C.26: The top header row shall be changed as indicated in the red box:

Labels	Upset Dimensions	
	Pin	Box

Table C.27: Footnotes “c,” “d,” and “e” shall be deleted, and footnote “b” shall be changed as indicated in the red box:

	Range 1 <sup>b</sup>	Range 2 <sup>b</sup>	Range 3 <sup>b</sup>
<b>CASING (PE/T and C/SF)</b>			
Total range length, inclusive	4.88 to 7.62	7.62 to 10.36	10.36 to 14.63
Permissible variation, max <sup>a</sup>	1.83	1.52	1.83
<b>TUBING AND CASING USED AS TUBING (PE/T and C/SF)</b>			
Total range length, inclusive	6.10 to 7.32	8.53 to 9.75	11.58 to 12.80
Permissible variation, max <sup>a</sup>	0.61	0.61	0.61
<b>INTEGRAL TUBING CONNECTIONS (including IJ/PE and IJ/SF)</b>			
Total range length, inclusive	6.10 to 7.92	8.53 to 10.36	11.58 to 13.72
Permissible variation, max <sup>a</sup>	0.61	0.61	0.61
<b>PUP JOINTS <sup>b</sup></b>	Lengths: 0.61; 0.91; 1.22; 1.83; 2.44; 3.05 and 3.66 Tolerance: ±0.076		
<sup>a</sup> Length variation applies to rail car shipment to the point of use and does not apply to order items of less than 18,144 kg of pipe.			
<sup>b</sup> Lengths other than those listed may be furnished by agreement between purchaser and manufacturer.			

Table C.37: Footnote “c” shall be changed to the following:

- <sup>c</sup> See 10.4.3. When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of one length.

Table C.38: Footnote “e” shall be changed to the following:

- <sup>e</sup> When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of one length.

Table C.39: Footnote “b” shall be changed to the following:

- <sup>b</sup> When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of one length.

Table C.40: Footnote “e” shall be deleted, and footnote “a” shall be rewritten, as indicated in the red boxes below. Additionally, the word “Grade” shall be deleted from the row headers.

Grade	Material		Number of Tests per Lot	Maximum Number of Pieces in a Lot	Type of Test	Location
1	2		3	4	5	6
L80	Pipe, coupling stock, coupling material	Label 1: $\leq 4 \frac{1}{2}$	2 <sup>a</sup>	200 <sup>b, c</sup>	Through-wall, 1 quadrant	Body tensile test
		Label 1: $> 4 \frac{1}{2}$	2 <sup>a</sup>	100 <sup>b, c</sup>	Through-wall, 1 quadrant	Body tensile test

...

C90, T95	As-quenched product		1	Each production run or heat treatment practice	Through-wall, 4 quadrants	Design area of greatest thickness
	Non-upset pipe		1	Each length	Through-wall, 1 quadrant	Approximately 50 % from each end
	Upset pipe		1	Each length	Surface—HRC or HBW	Pipe body and one upset <sup>d</sup>
			1	20 <sup>c</sup>	Through-wall, 4 quadrants	One upset
			1	Label 1: $\leq 4 \frac{1}{2}$ : 200 Label 1: $> 4 \frac{1}{2}$ : 100	Through-wall, 4 quadrants	Pipe body tensile test
	Coupling blanks, coupling stock	Tube-length heat treatment	2 <sup>a</sup>	Each length	Through-wall, 4 quadrants	One from each end

...

C110	As-quenched product		1	Each production run or heat treatment practice	Through-wall, 4 quadrants	Design area of greatest thickness
	Non-upset pipe		2	One from each end	Through-wall, 1 quadrant	Each end of each piece
	Coupling blanks, coupling stock, coupling material, pup joints and accessory material	Tube length heat treatment	2 <sup>a</sup>	Each length	Through-wall, 4 quadrants	One from each end
		Individual heat treatment	1	Each piece	Surface—HRC or HBW	Each piece
			1	Label 1: $< 9 \frac{5}{8}$ : 50 <sup>c</sup> Label 1: $\geq 9 \frac{5}{8}$ : 30 <sup>c</sup>	Through-wall, 4 quadrants	From a piece with the highest surface hardness number in the lot
Q125	Casing		3 <sup>a</sup>	Lot (see 10.2) <sup>b, c</sup>	Through-wall, 1 quadrant	Pipe body
	Coupling blanks, coupling stock, coupling material, pup joints and accessory material	Tube length heat treatment	1	Each length	Through-wall, 1 quadrant	Approximately 50 % from each end
		Individual heat treatment	1	Each piece	Surface—HRC or HBW	Each piece
			1	Label 1: $< 9 \frac{5}{8}$ : 50 <sup>c</sup> Label 1: $\geq 9 \frac{5}{8}$ : 30 <sup>c</sup>	Through-wall, 1 quadrant	Randomly selected piece

<sup>a</sup> When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of one length.

<sup>b</sup> The lengths tested shall be selected randomly and represent the start and end of the heat treatment cycle.

<sup>c</sup> Each lot shall be from the same heat of steel for Grades L80 9Cr, L80 13Cr, C90, T95, and Q125.

<sup>d</sup> One upset approximately 50 % from each end if both ends are upset.

Table C.48: A row shall be added to the table, as indicated by the red box below:

1	2	3	Stencil and/or Stamp Marking Requirements <sup>a</sup>				
			Grades H40, J55, K55, N80 (All Types), R95, and P110		Grades L80 (All Types), C90, T95, C110, and Q125		All Grades
			Pipe	Couplings and Accessories	Pipe	Couplings and Accessories	Coupling Stock and Accessory Materials
4	5	6	7	8			
11	Supplementary requirements, if applicable: — K.2 (SR 1) — K.3 (SR 2) — K.4 (SR 9) (fill in type) — K.8 (SR 13) — K.9 (SR 16) (fill in minimum full-size energy absorption requirement, in joules, and test temperature including ± symbol and °C) — K.10 (SR 22)	S1 S2 S9Q«...» S13 S16«...»C S22	P P  P P P	   D or P  D	P P  P P P	  P P  D	
	— K.14 (SR 41)	S41.1 S41.2	P P		P P		
	— Annex H (PSL)	L2 or L3	P	P	P	P	P

Table C.49: The table shall be changed as indicated in the red box below:

Requirement	Sub-section Reference
...	
<b>Hydrostatic Tests</b>	
Tester recorder charts	10.12.1
Testing	10.12.1
Supplemental inspection when hydrostatic test pressure is limited, if applicable	K.14.1 (SR 41.1), K.14.2 (SR 41.2)

Table E.1: Footnote “e” shall be added as indicated by the red boxes:

Labels	Outside Diameter	Nominal Linear Mass <sup>b,c</sup> T&C	Wall Thickness	Type of End-finish <sup>d, e</sup>
...				
<sup>a</sup> Labels are for information and assistance in ordering. <sup>b</sup> Nominal linear masses (Column 4) are shown for information only. <sup>c</sup> The densities of martensitic chromium steels (L80 Types 9Cr and 13Cr) are different from carbon steels; The masses shown are therefore not accurate for martensitic chromium steels; A mass correction factor of 0.989 may be used. <sup>d</sup> Buttress casing is available with regular, special clearance couplings or special clearance couplings with special bevel. <sup>e</sup> For casing with S, L, B connections, intermediate wall thicknesses are allowed in accordance with 5.2.3 and 8.2 and API 5B.				

Table E.4: The table will change as indicated by the red box:

Grade	Type	C		Mn		Mo		Cr		Ni	Cu	P	S	Si
		min	max	min	max	min	max	min	max	max	max	max	max	max
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
...														
Q125	1	—	0.35		1.35	—	0.85	—	1.50	—	—	0.020	0.010	—

Table E.5: The table will change as indicated by the red boxes:

Grade	Type	Total Elongation Under Load %	Yield Strength MPa		Tensile Strength min MPa	Hardness <sup>a,c</sup> max		Specified Wall Thickness mm	Allowable Hardness Variation <sup>b</sup> HRC
			min	max		HRC	HBW		
1	2	3	4	5	6	7	8	9	10
...									
C110	—	0.7	758	828	793	29.0	279	≤12.70 12.71 to 19.04 19.05 to 25.39 ≥ 25.40	3.0 4.0 5.0 6.0

Table E.25: The footnotes shall be changed as indicated in the red boxes:

<sup>a</sup> Labels are for information and assistance in ordering.
<sup>b</sup> The densities of martensitic chromium steels (L80 9Cr and 13Cr) are different from carbon steels; The masses shown are therefore not accurate for chromium steels; A mass correction factor of 0.989 shall be used.
<sup>c</sup> The minimum outside diameter of upset $D_4$ is limited by the minimum length of full-crest threads. See API 5B.
<sup>d</sup> For pup joints only, the length tolerance on $L_{en}$ is $\begin{matrix} +4 \\ -1 \end{matrix}$ in.; The length on $L_b$ may be 4 in. longer than specified.
<sup>e</sup> For extended-length upsets on external upset tubing, add 1 in. to the dimensions in Columns 6, 7, and 8.

Table E.26: The top header row shall be changed as indicated in the red box:

Labels	Upset Dimensions	
	Pin	Box

Table E.27: Footnotes “c,” “d,” and “e” shall be deleted, and footnote “b” shall be changed as indicated in the red box:

	Range 1 <sup>b</sup>	Range 2 <sup>b</sup>	Range 3 <sup>b</sup>
<b>CASING (PE/T and C/SF)</b>			
Total range length, inclusive	16.0 to 25.0	25.0 to 34.0	34.0 to 48.0
Permissible variation, max <sup>a</sup>	6.0	5.0	6.0
<b>TUBING AND CASING USED AS TUBING (PE/T and C/SF)</b>			
Total range length, inclusive	20.0 to 24.0	28.0 to 32.0	38.0 to 42.0
Permissible variation, max <sup>a</sup>	2.0	2.0	2.0
<b>INTEGRAL TUBING CONNECTIONS (including IJ/PE and IJ/SF)</b>			
Total range length, inclusive	20.0 to 26.0	28.0 to 34.0	38.0 to 45.0
Permissible variation, max <sup>a</sup>	2.0	2.0	2.0
<b>PUP JOINTS <sup>b</sup></b>	Lengths: 2; 3; 4; 6; 8; 10; and 12 Tolerance: ±3 in.		
<sup>a</sup> Length variation applies to rail car shipment to the point of use and does not apply to order items less than 40,000 lb of pipe.			
<sup>b</sup> Lengths other than those listed may be furnished by agreement between purchaser and manufacturer.			

Table E.37: Footnote “c” shall be changed to the following:

<sup>c</sup> See 10.4.3. When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of one length.

Table E.38: Footnote “e” shall be changed to the following:

<sup>e</sup> When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of the length.

Table E.39: Footnote “b” shall be changed to the following:

<sup>b</sup> When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of one length.



Table E.40: Footnote “e” shall be deleted, and footnote “a” shall be rewritten, as indicated in the red boxes below. Additionally, the word “Grade” shall be deleted from the row headers.

Grade	Material		Number of Tests per Lot	Maximum Number of Pieces in a Lot	Type of Test	Location
1	2		3	4	5	6
L80	Pipe, coupling stock, coupling material	Label 1: $\leq 4 \frac{1}{2}$	2 <sup>a</sup>	200 <sup>b, c</sup>	Through-wall, 1 quadrant	Body tensile test
		Label 1: $> 4 \frac{1}{2}$	2 <sup>a</sup>	100 <sup>b, c</sup>	Through-wall, 1 quadrant	Body tensile test

...

C90, T95	As-quenched product		1	Each production run or heat treatment practice	Through-wall, 4 quadrants	Design area of greatest thickness
	Non-upset pipe		1	Each length	Through-wall, 1 quadrant	Approximately 50 % from each end
	Upset pipe		1	Each length	Surface—HRC or HBW	Pipe body and one upset <sup>d</sup>
			1	20 <sup>c</sup>	Through-wall, 4 quadrants	One upset
			1	Label 1: $\leq 4 \frac{1}{2}$ : 200 Label 1: $> 4 \frac{1}{2}$ : 100	Through-wall, 4 quadrants	Pipe body tensile test
	Coupling blanks, coupling stock	Tube-length heat treatment	2 <sup>a</sup>	Each length	Through-wall, 4 quadrants	One from each end

...

C110	As-quenched product		1	Each production run or heat treatment practice	Through-wall, 4 quadrants	Design area of greatest thickness
	Non-upset pipe		2	One from each end	Through-wall, 1 quadrant	Each end of each piece
	Coupling blanks, coupling stock, coupling material, pup joints and accessory material	Tube length heat treatment	2 <sup>a</sup>	Each length	Through-wall, 4 quadrants	One from each end
		Individual heat treatment	1	Each piece	Surface—HRC or HBW	Each piece
			1	Label 1: $< 9 \frac{5}{8}$ : 50 <sup>c</sup> Label 1: $\geq 9 \frac{5}{8}$ : 30 <sup>c</sup>	Through-wall, 4 quadrants	From a piece with the highest surface hardness number in the lot
Q125	Casing		3 <sup>a</sup>	Lot (see 10.2) <sup>b, c</sup>	Through-wall, 1 quadrant	Pipe body
	Coupling blanks, coupling stock, coupling material, pup joints and accessory material	Tube length heat treatment	1	Each length	Through-wall, 1 quadrant	Approximately 50 % from each end
		Individual heat treatment	1	Each piece	Surface—HRC or HBW	Each piece
			1	Label 1: $< 9 \frac{5}{8}$ : 50 <sup>c</sup> Label 1: $\geq 9 \frac{5}{8}$ : 30 <sup>c</sup>	Through-wall, 1 quadrant	Randomly selected piece

<sup>a</sup> When more than one test is required, the test specimens shall be from different lengths, except for a single piece lot where the test specimens may be taken from both ends of one length.

<sup>b</sup> The lengths tested shall be selected randomly and represent the start and end of the heat treatment cycle.

<sup>c</sup> Each lot shall be from the same heat of steel for Grades L80 9Cr, L80 13Cr, C90, T95, and Q125.

<sup>d</sup> One upset approximately 50 % from each end if both ends are upset.

Table E.48: A row shall be added to the table, as indicated by the red box below:

Marking Sequence		Mark or Symbol <sup>b</sup>	Stencil and/or Stamp Marking Requirements <sup>a</sup>				
			Grades H40, J55, K55, N80 (All Types), R95, and P110		Grades L80 (All Types), C90, T95, C110, and Q125		All Grades
			Pipe	Couplings and Accessories	Pipe	Couplings and Accessories	Coupling Stock and Accessory Materials
1	2	3	4	5	6	7	8
11	Supplementary requirements, if applicable: — K.2 (SR 1) — K.3 (SR 2) — K.4 (SR 9) (fill in type) — K.8 (SR 13) — K.9 (SR 16) (fill in minimum full-size energy absorption requirement, in joules, and test temperature including ± symbol and °C) — K.10 (SR 22)	S1 S2 S9Q«...» S13 S16«...»C S22	P P  P P P	   D or P  D	P P  P P P	  P P  D	
	— K.14 (SR 41)	S41.1 S41.2	P P		P P		
	— Annex H (PSL)	L2 or L3	P	P	P	P	P

Table E.49: The table shall be changed as indicated in the red box below:

Requirement	Sub-section Reference
...	
<b>Hydrostatic Tests</b>	
Tester recorder charts	10.12.1
Testing	10.12.1
Supplemental inspection when hydrostatic test pressure is limited, if applicable	K.14.1 (SR 41.1), K.14.2 (SR 41.2)

K.10.2.1: The section header shall be changed to the following:

**K.10.2.1 SR 22.1—Casing and Coupling Threads General Requirements**

K.10.2.2: The paragraph shall be changed to the following:

An equilateral triangle die stamp 6.35 mm (1/4 in.) high shall be placed at a distance of  $L_9$  from each end of each pipe using the applicable method identified in 11.2.6. See Figure D.23 for SR 22.1.

*K.14 / K.14.1 / K.14.2: The following sections shall be added:*

**K.14 SR 41—Supplemental Inspection when Hydrostatic Test Pressure is Limited to 69.0 MPa (10,000 psi)**

**K.14.1 SR 41.1—Wall Thickness Measuring, Recording, and Reporting**

For each length of pipe, the wall thickness shall be measured and recorded over the full length with a minimum coverage of 100 % of the surface area covered by the automatic system. The minimum measured wall thickness for each pipe shall be recorded. Traceability and/or reporting of minimum measured wall thickness to each unique pipe is only required when specified on the purchase agreement.

**K.14.2 SR 41.2—Non-destructive Examination of Pipe**

Additionally, when agreed between purchaser and manufacturer, for each length of pipe a full-body imperfection NDE utilizing oblique OD/ID reference indicators consistent with the defects typical of the manufacturer's manufacturing process as required in 10.15.4.2 e) shall be performed.