

# DIN EN ISO 11960:2014-05 (E)

Petroleum and natural gas industries - Steel pipes for use as casing or tubing for wells (ISO 11960:2014); English version EN ISO 11960:2014, only on CD-ROM

---

## Contents

Page

Foreword .....	vi
Introduction.....	vii
1 Scope .....	1
2 Conformance .....	2
2.1 Dual referencing of normative references .....	2
2.2 Units of measurement.....	2
3 Normative references.....	2
4 Terms, definitions, symbols and abbreviated terms .....	5
4.1 Terms and definitions .....	5
4.2 Symbols and abbreviated terms .....	9
5 Information to be supplied by the purchaser .....	10
5.1 Grades C90, T95 and C110 .....	10
5.2 Casing.....	10
5.3 Tubing.....	12
5.4 Coupling stock, coupling material and accessory material.....	13
6 Process of manufacture.....	14
6.1 General .....	14
6.2 Heat treatment .....	15
6.3 Straightening .....	15
6.4 Traceability.....	16
6.5 Processes requiring validation .....	17
7 Material requirements .....	17
7.1 Chemical composition .....	17
7.2 Tensile properties.....	17
7.3 Charpy V-notch test — General requirements .....	18
7.4 Charpy V-notch — Absorbed energy requirements for coupling stock, coupling material, coupling blanks and couplings.....	20
7.5 Charpy V-notch — Absorbed energy requirements for pipe .....	21
7.6 Charpy V-notch — Absorbed energy requirements for accessory material .....	23
7.7 Maximum hardness .....	23
7.8 Hardness variation — Grades C90, T95, C110 and Q125 .....	24
7.9 Process control — Grades C90, T95, C110 and Q125 .....	24
7.10 Hardenability — Minimum percentage martensite for quenched and tempered products .....	24
7.11 Grain size — Grades C90, T95 and C110 .....	25
7.12 Surface condition — Grades L80 9Cr and L80 13Cr .....	25
7.13 Flattening — Electric-welded pipe.....	25
7.14 Sulfide stress cracking test — Grades C90, T95 and C110.....	25
8 Dimensions, masses, tolerances, product ends and defects.....	28
8.1 Labels and sizes .....	28
8.2 Dimensions and masses.....	28
8.3 Diameter .....	29
8.4 Wall thickness.....	29
8.5 Mass.....	30
8.6 Length.....	30
8.7 Casing jointers.....	30
8.8 Height and trim of electric-weld flash .....	30
8.9 Straightness.....	31
8.10 Drift requirements .....	31

8.11	Tolerances on dimensions and masses.....	32
8.12	Product ends.....	33
8.13	Defects.....	34
8.14	Coupling make-up and thread protection.....	35
9	Couplings.....	36
9.1	General requirements.....	36
9.2	Alternative grades or heat treatments.....	36
9.3	Mechanical properties.....	36
9.4	Dimensions and tolerances.....	37
9.5	Regular couplings.....	37
9.6	Special-clearance couplings — Groups 1, 2 and 3.....	37
9.7	Combination couplings.....	37
9.8	Reducing couplings — Groups 1, 2 and 3.....	37
9.9	Seal-ring couplings.....	37
9.10	Special-bevel tubing regular couplings — Groups 1, 2 and 3.....	38
9.11	Threading.....	38
9.12	Surface inspection.....	38
9.13	Measurement of imperfections.....	39
9.14	Repair and removal of imperfections and defects.....	39
9.15	Thread surface treatment — Grade Q125.....	39
9.16	Couplings and coupling blank protection — Grades C90, T95, C110 and Q125.....	39
10	Inspection and testing.....	39
10.1	Test equipment.....	39
10.2	Lot definition for testing of mechanical properties.....	40
10.3	Testing of chemical composition.....	40
10.4	Tensile tests.....	41
10.5	Flattening test.....	44
10.6	Hardness test.....	45
10.7	Impact test.....	51
10.8	Grain size determination — Grades C90, T95 and C110.....	52
10.9	Hardenability — Grades C90, T95 and C110.....	53
10.10	Sulfide stress-cracking test — Grades C90, T95 and C110.....	53
10.11	Metallographic evaluation — EW Grades P110 and Q125.....	53
10.12	Hydrostatic tests.....	53
10.13	Dimensional testing.....	55
10.14	Visual inspection.....	58
10.15	Non-destructive examination (NDE).....	59
11	Marking.....	66
11.1	General.....	66
11.2	Stamp marking requirements.....	67
11.3	Stencil marking requirements.....	68
11.4	Colour identification.....	69
11.5	Thread and end-finish marking — All groups.....	70
11.6	Pipe-threader marking requirements — All groups.....	70
12	Coating and protection.....	71
12.1	Coatings — All groups.....	71
12.2	Thread protectors.....	71
13	Documents.....	72
13.1	Electronic media — All groups.....	72
13.2	Certification — Groups 1, 2 (except Grade C110) and 3.....	72
13.3	Certification requirements — Grades C110 and Q125.....	72
13.4	Retention of records.....	72
14	Minimum facility requirements for various categories of manufacturer.....	72
14.1	Pipe mill.....	72
14.2	Processor.....	73
14.3	Pipe threader.....	73
14.4	Coupling, pup-joint or accessory manufacturer.....	73

<b>Annex A (normative) Supplementary requirements.....</b>	<b>75</b>
<b>Annex B (normative) Purchaser inspection.....</b>	<b>92</b>
<b>Annex C (normative) Tables in SI units.....</b>	<b>93</b>
<b>Annex D (normative) Figures in SI (USC) units.....</b>	<b>142</b>
<b>Annex E (normative) Tables in USC units.....</b>	<b>167</b>
<b>Annex F (normative) Use of the API Monogram by Licensees.....</b>	<b>215</b>
<b>Annex G (informative) Procedures used to convert from USC units to SI units.....</b>	<b>222</b>
<b>Annex H (normative) Product Specification Levels.....</b>	<b>234</b>
<b>Annex I (normative) Requirements for thread protector design validation.....</b>	<b>241</b>
<b>Annex J (informative) Summary of Product Specification Level (PSL) requirements.....</b>	<b>245</b>
<b>Annex K (normative) Modification of the hydrogen sulfide titration procedures in ANSI-NACE TM0284-2003, Appendix C.....</b>	<b>252</b>
<b>Annex L (informative) Technical changes from the previous edition.....</b>	<b>253</b>
<b>Bibliography.....</b>	<b>262</b>