

Contents

Page

European foreword.....	4
Introduction	6
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions	8
4 Designations.....	8
4.1 Material.....	8
4.1.1 General.....	8
4.1.2 Symbol.....	8
4.1.3 Number	8
4.2 Material condition	8
4.3 Product.....	9
5 Ordering information	10
6 Requirements	11
6.1 Composition	11
6.2 Mechanical properties.....	11
6.3 Dimensions and tolerances	11
6.3.1 General.....	11
6.3.2 Outside or inside diameter.....	11
6.3.3 Wall thickness	12
6.3.4 Fixed lengths.....	12
6.3.5 Tolerances on form	12
6.4 Surface quality.....	12
6.5 Technological requirements.....	12
6.5.1 Drift expanding.....	12
6.5.2 Residual stress level.....	12
6.5.3 Grain size.....	13
6.5.4 Freedom from defects.....	13
7 Sampling.....	13
7.1 General.....	13
7.2 Analysis.....	13
7.3 Mechanical tests and stress corrosion resistance test	13
8 Test methods	13
8.1 Analysis.....	13
8.2 Tensile test	14
8.3 Hardness test.....	14
8.4 Technological tests	14
8.4.1 Drift expanding test.....	14
8.4.2 Stress corrosion resistance test.....	14

8.4.3	Average grain size determination	14
8.5	Freedom from defects tests.....	14
8.6	Retests	14
8.6.1	Analysis, tensile, hardness, drift expanding and grain size tests.....	14
8.6.2	Stress corrosion resistance test	15
8.7	Rounding of results	15
9	Declaration of conformity and inspection documentation	15
9.1	Declaration of conformity	15
9.2	Inspection documentation	15
10	Marking, packaging, labelling	15
	Bibliography	49
	Figures	
	Figure 1 — Measurement of straightness	47
	Tables	
	Table 1 — Composition of copper	16
	Table 2 — Composition of low alloyed copper alloys	17
	Table 3 — Composition of copper-nickel alloys	17
	Table 4 — Composition of copper-nickel-zinc alloys.....	18
	Table 5 — Composition of copper-tin alloys.....	18
	Table 6 — Composition of binary copper-zinc alloys	19
	Table 7 — Composition of copper-zinc-lead alloys	20
	Table 8 — Composition of complex copper-zinc alloys.....	21
	Table 9 — Mechanical properties of copper and low alloyed copper alloys	22
	Table 10 — Mechanical properties of copper-nickel alloys	26
	Table 11 — Mechanical properties of copper-nickel-zinc alloys	27
	Table 12 — Mechanical properties of copper-tin alloys.....	28
	Table 13 — Mechanical properties of binary copper-zinc alloys.....	31
	Table 14 — Mechanical properties of copper-zinc-lead alloys	36
	Table 15 — Mechanical properties of complex copper-zinc alloys	40
	Table 16 — Minimal elongation values for R250 (half hard) material condition tubes	45
	Table 17 — Tolerances on diameter.....	45
	Table 18 — Tolerances on wall thickness.....	46
	Table 19 — Tolerances on fixed lengths, tubes in straight lengths	46
	Table 20 — Tolerances on fixed lengths, tube in coils (not level wound).....	46
	Table 21 — Tolerances on diameter including deviation from circular form, tube in coils	47
	Table 22 — Tolerances on straightness.....	47
	Table 23 — Sampling rate.....	48