



SLOVENSKI STANDARD
SIST CR 13388:1999

01-november-1999

6 U_Yf`]b`VU_fcj Y`n`]h]bY!`-nj`Y Y_`_Ya] b]`gYghUj`]b`]nXY`_cj

Copper and copper alloys - Compendium of compositions and products

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: CR 13388:1998

[SIST CR 13388:1999](#)

<https://standards.iteh.ai/catalog/standards/sist/75689f9a-a4a5-43a2-b6b9-810f8c993431/sist-cr-13388-1999>

ICS:

77.120.30	Baker in bakrove zlitine	Copper and copper alloys
77.150.30	Bakreni izdelki	Copper products

SIST CR 13388:1999

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST CR 13388:1999

<https://standards.iteh.ai/catalog/standards/sist/75689f9a-a4a5-43a2-b6b9-810f8c993431/sist-cr-13388-1999>

CEN REPORT
RAPPORT CEN
CEN BERICHT

CR 13388

November 1998

ICS

Descriptors:

English version

Copper and copper alloys - Compendium of compositions and products

This CEN Report was approved by CEN on 3 September 1998. It has been drawn up by the Technical Committee CEN/TC 133.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

(standards.iteh.ai)

SIST CR 13388:1999

<https://standards.iteh.ai/catalog/standards/sist/756899a-a4a5-43a2-b6b9-810f8c993431/sist-cr-13388-1999>



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

Contents

	Page		Page
Foreword	3	Table 9: Composition of copper-zinc alloys, complex	16
Introduction	4	Table 10: Wrought coppers and copper alloys specified in European product standards prepared by CEN/TC 133	18
1 Scope	4	Table 11: Master alloys – Composition	24
2 Compositions of coppers and copper alloys standardized by CEN/TC 133	4	Table 12.1: Ingots and castings – Copper and copper-chromium alloys – Composition and casting processes ...	26
2.1 Composition of coppers	4	Table 12.2: Ingots and castings – Copper-zinc alloys – Composition and casting processes	27
2.2 Composition of copper alloys	4	Table 12.3: Ingots and castings – Copper-tin alloys – Composition and casting processes	29
2.3 Composition of master alloys	5	Table 12.4: Ingots and castings – Copper-tin-lead alloys – Composition and casting processes	30
2.4 Composition of ingots and castings	5	Table 12.5: Ingots and castings – Copper-aluminium alloys – Composition and casting processes	31
2.5 Composition of filler metals	5	Table 12.6: Ingots and castings – Copper-manganese-aluminium alloys – Composition and casting processes ...	32
2.6 Composition of copper and copper alloy scrap	5	Table 12.7: Ingots and castings – Copper-nickel alloys – Composition and casting processes	33
3 Available product forms of copper and copper alloys standardized by CEN/TC 133	5	Table 13.1: Filler metals – Composition of copper	34
3.1 Wrought coppers and copper alloys	5	Table 13.2: Filler metals – Composition of miscellaneous copper alloys	35
3.2 Master alloys	5	Table 13.3: Filler metals – Composition of copper-zinc alloys	36
3.3 Ingots and castings	6	Table 13.4: Filler metals – Composition of copper-tin alloys	37
3.4 Filler metals	6	Table 13.5: Filler metals – Composition of copper-aluminium alloys	37
3.5 Scrap	6	Table 13.6: Filler metals – Composition of copper-nickel-zinc alloys	37
4 Copper and copper alloys registered by CEN/TC 133	6	Table 14: Scrap – Composition	38
Table 1.1: Composition of unalloyed copper grades made from Cu-CATH-1 (CR001A) according to EN 1978	7	Annex A Bibliography	41
Table 1.2: Composition of unalloyed copper grades, other than those made from Cu-CATH-1 (CR001A) according to EN 1978	8		
Table 1.3: Composition of phosphorus-containing copper grades	8		
Table 1.4: Composition of silver-containing copper grades (silver-bearing coppers) ..	9		
Table 2: Composition of copper alloys, low alloyed (less than 5 % alloying elements)	10		
Table 3: Composition of copper-aluminium alloys	12		
Table 4: Composition of copper-nickel alloys	12		
Table 5: Composition of copper-nickel-zinc alloys	13		
Table 6: Composition of copper-tin alloys ..	13		
Table 7: Composition of copper-zinc alloys, binary	14		
Table 8: Composition of copper-zinc-lead alloys	15		



Foreword

This CEN Report has been prepared by Technical Committee CEN/TC 133 "Copper and copper alloys", the Secretariat of which is held by DIN.

Within its programme of work, Technical Committee CEN/TC 133 prepared the following CEN Report:

CR 133/91

Copper and copper alloys – Compendium of compositions and products

In the course of its plenary meeting on 30/31 October 1997, CEN/TC 133 "Copper and copper alloys" agreed by Resolution No. 4, see document CEN/TC 133 N 830, to submit this document for BT approval.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST CR 13388:1999](https://standards.iteh.ai/catalog/standards/sist/756899a-a4a5-43a2-b6b9-810f8c993431/sist-cr-13388-1999)

<https://standards.iteh.ai/catalog/standards/sist/756899a-a4a5-43a2-b6b9-810f8c993431/sist-cr-13388-1999>

Introduction

CEN/TC 133 "Copper and copper alloys" was established in 1988 to prepare and maintain standards in the field of unwrought, wrought and cast products made from copper and copper alloys. Its responsibilities included developing, defining, specifying and giving guidance on, as appropriate, material compositions, designations, terminology, dimensions and tolerances, mechanical and physical characteristics, conditions of delivery and methods of testing peculiar to copper and copper alloys.

During the development of standards for copper and copper alloy products, the experts realized the necessity and seized the opportunity:

- a) to co-ordinate and in some cases also to rationalize the composition limits which already existed for the various product forms;
- b) to establish unique, new and identifiably European designations for copper and copper alloys including a numerical option to be particularly convenient for computerized handling;
- c) to confirm, clarify and re-define where necessary, the terminology which already existed in common usage, at the International level or in customs nomenclature.

CEN/TC 133 decided, in view of the new form of presentation and new parameters for the description and provision of information on copper and copper alloy products, to prepare and publish the present consolidation and summary of essential details.

1 Scope

This document provides a summary of material designations, compositions and the product forms in which they are available, for coppers and copper alloys standardized in European Standards by CEN/TC 133 "Copper and copper alloys".

It also includes copper alloys which are not standardized by CEN/TC 133 but by other CEN Technical Committees responsible for products in copper alloys, and other copper alloys not yet standardized. These alloys have been registered by CEN/TC 133 in accordance with the procedures laid down in CEN Report CR 12776.

2 Compositions of coppers and copper alloys standardized by CEN/TC 133

2.1 Composition of coppers

The symbol and number designations and compositions of copper grades are given in the following tables:

Table 1.1: Composition of unalloyed copper grades made from Cu-CATH-1 (CR001A)

Table 1.2: Composition of unalloyed copper grades, other than those made from Cu-CATH-1 (CR001A)

Table 1.3: Composition of phosphorus-containing copper grades

Table 1.4: Composition of silver-containing copper grades (silver-bearing coppers)

2.2 Composition of copper alloys

The symbol and number designations and compositions of copper alloys are given in the following tables:

Table 2: Composition of copper alloys, low alloyed (less than 5 % alloying elements)

Table 3: Composition of copper-aluminium alloys

Table 4: Composition of copper-nickel alloys

Table 5: Composition of copper-nickel-zinc alloys

Table 6: Composition of copper-tin alloys

Table 7: Composition of copper-zinc alloys, binary

Table 8: Composition of copper-zinc-lead alloys

Table 9: Composition of copper-zinc alloys, complex

2.3 Composition of master alloys

The symbol and number designations and compositions of master alloys in accordance with EN 1981 are given in table 11.

2.4 Composition of ingots and castings

The symbol and number designations and compositions of ingots and castings in accordance with EN 1982 are given in the following tables:

Table 12.1: Ingots and castings – Composition of copper and copper-chromium alloys and casting processes

Table 12.2: Ingots and castings – Composition of copper-zinc alloys and casting processes

Table 12.3: Ingots and castings – Composition of copper-tin alloys and casting processes

Table 12.4: Ingots and castings – Composition of copper-tin-lead alloys and casting processes

Table 12.5: Ingots and castings – Composition of copper-aluminium alloys and casting processes

Table 12.6: Ingots and castings – Composition of copper-manganese-aluminium alloys and casting processes

Table 12.7: Ingots and castings – Composition of copper-nickel alloys and casting processes

2.5 Composition of filler metals

(standards.iteh.ai)

The symbol and number designations and compositions of filler metals in accordance with prEN 13347 are given in the following tables:

<https://standards.iteh.ai/catalog/standards/sist/756899a-a4a5-43a2-b6b9-8108c993431/sist-cr-13388-1999>

Table 13.1: Filler metals – Composition of copper

Table 13.2: Filler metals – Composition of miscellaneous copper alloys

Table 13.3: Filler metals – Composition of copper-zinc alloys

Table 13.4: Filler metals – Composition of copper-tin alloys

Table 13.5: Filler metals – Composition of copper-aluminium alloys

Table 13.6: Filler metals – Composition of copper-nickel-zinc alloys

2.6 Composition of copper and copper alloy scrap

The symbol and number designations and compositions of copper and copper alloy scrap in accordance with prEN 12861 are given in table 14.

3 Available product forms of copper and copper alloys standardized by CEN/TC 133

3.1 Wrought coppers and copper alloys

The product forms and applicable standards are given in table 10.

3.2 Master alloys

The product forms are given in table 11.

3.3 Ingots and castings

The product forms are given in tables 12.1 to 12.7.

3.4 Filler metals

The product forms are given in tables 13.1 to 13.6.

3.5 Scrap

The product forms are given in table 14.

4 Copper and copper alloys registered by CEN/TC 133

The symbol and number designations of copper grades and copper alloys registered by CEN/TC 133 in accordance with the procedures laid down in CR 12776 will be given in table 15.

NOTE: At the time of publication of this Report, no requests for registration of copper grades or copper alloys had been received.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST CR 13388:1999

<https://standards.iteh.ai/catalog/standards/sist/756899a-a4a5-43a2-b6b9-810f8c993431/sist-cr-13388-1999>

Table 1.1: Composition of unalloyed copper grades made from Cu-CATH-1 (CR001A) according to EN 1978

Material designation		Composition in % (m/m)																	Elements listed in this table other than copper						
Symbol	Number unwrought copper	Element	Cu	Ag	As	Bi	Cd	Co	Cr	Fe	Mn	Ni	O	P	Pb	S	Sb	Se	Si	Sn	Te	Zn	total	excluding O	
			min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.	min. max.			min. max.
Cu-ETP1	CR003A	min. max.	99,99	0,002 5	0,000 5 ¹⁾	0,000 20 ²⁾	—	—	—	0,001 0 ³⁾	—	0,040	—	—	0,000 5	0,001 5	0,000 4 ¹⁾	0,000 20 ²⁾	—	—	—	—	—	0,006 5	—
Cu-OF1	CR007A	min. max.	99,99	0,002 5	0,000 5 ¹⁾	0,000 20 ²⁾	—	—	—	0,001 0 ³⁾	—	—	—	—	0,000 5	0,001 5	0,000 4 ¹⁾	0,000 20 ²⁾	—	—	—	—	—	0,006 5	—
Cu-OFE	CR009A	min. max.	99,99	0,002 5	0,000 5	0,000 20	0,000 1	—	—	0,001 0	0,000 5	0,001 0	—	—	0,000 5	0,001 5	0,000 4	0,000 20	—	—	0,000 2	0,000 20	—	—	—
Cu-PHCE	CR022A	min. max.	99,99	0,002 5	0,000 5	0,000 20	0,000 1	—	—	0,001 0	0,000 5	0,001 0	—	—	0,000 5	0,001 5	0,000 4	0,000 20	—	—	0,000 2	0,000 20	—	—	—

¹⁾ (As+Cd+Cr+Mn+P+Sb) max. 0,001 5 %

²⁾ (Bi+Se+Te) max. 0,000 3 %, of which (Se+Te) max. 0,000 30 %

³⁾ (Co+Fe+Ni+Si+Sn+Zn) max. 0,002 0 %

⁴⁾ The oxygen content shall be controlled by the manufacturer so that the material conforms to the hydrogen embrittlement requirements of EN 1976.

STANDARD PREVIEW
standards.iteh.ai
SIST CR 13388:1999
https://standards.iteh.ai/catalog/standards/sist/756899a-a4a5-43a2-b6b9-810f8c993434/sist-cr-13388-1999

Table 1.2: Composition of unalloyed copper grades, other than those made from Cu-CATH-1 (CR001A) according to EN 1978

Material designation			Composition in % (m/m)						
Symbol	Number		Element	Cu ¹⁾	Bi	O	Pb	Other elements (see note)	
	unwrought copper	wrought copper						total	excluding
Cu-ETP	CR004A	CW004A	min.	99,90	—	—	—	—	—
			max.	—	0,000 5	0,040 ²⁾	0,005	0,03	Ag, O
Cu-FRHC	CR005A	CW005A	min.	99,90	—	—	—	—	—
			max.	—	—	0,040 ²⁾	—	0,04	Ag, O
Cu-FRTP	CR006A	CW006A	min.	99,90	—	—	—	—	—
			max.	—	—	0,100	—	0,05	Ag, Ni, O
Cu-OF	CR008A	CW008A	min.	99,95	—	—	—	—	—
			max.	—	0,000 5	— ³⁾	0,005	0,03	Ag

¹⁾ Including silver, up to a maximum of 0,015 %.

²⁾ Oxygen content up to 0,060 % is permitted, subject to agreement between the purchaser and the supplier.

³⁾ The oxygen content shall be controlled by the manufacturer so that the material conforms to the hydrogen embrittlement requirements of EN 1976.

NOTE: The total of other elements (than copper) is defined as the sum of Ag, As, Bi, Cd, Co, Cr, Fe, Mn, Ni, O, P, Pb, S, Sb, Se, Si, Sn, Te and Zn, subject to the exclusion of any individual elements indicated.

Table 1.3: Composition of phosphorus-containing copper grades

Material designation			Composition in % (m/m)						
Symbol	Number		Element	Cu ¹⁾	Bi	P	Pb	Other elements (see note)	
	unwrought copper	wrought copper						total	excluding
Cu-PHC	CR020A	CW020A	min.	99,95	—	0,001	—	—	—
			max.	—	0,000 5	0,006	0,005	0,03 ²⁾	Ag, P
Cu-HCP	CR021A	CW021A	min.	99,95	—	0,002	—	—	—
			max.	—	0,000 5	0,007	0,005	0,03 ²⁾	Ag, P
Cu-DLP	CR023A	CW023A	min.	99,90	—	0,005	—	—	—
			max.	—	0,000 5	0,013	0,005	0,03	Ag, Ni, P
Cu-DHP	CR024A	CW024A	min.	99,90	—	0,015	—	—	—
			max.	—	—	0,040	—	— ³⁾	—
Cu-DXP	CR025A	—	min.	99,90	—	0,04	—	—	—
			max.	—	0,000 5	0,06	0,005	0,03	Ag, Ni, P

¹⁾ Including silver, up to a maximum of 0,015 %.

²⁾ The oxygen content shall be controlled by the manufacturer so that the material conforms to the hydrogen embrittlement requirements of EN 1976.

³⁾ If required, the permitted total of elements, other than silver and phosphorus, should be agreed between the purchaser and the supplier.

NOTE: The total of other elements (than copper) is defined as the sum of Ag, As, Bi, Cd, Co, Cr, Fe, Mn, Ni, O, P, Pb, S, Sb, Se, Si, Sn, Te and Zn, subject to the exclusion of any individual elements indicated.

Table 1.4: Composition of silver-containing copper grades (silver-bearing coppers)

Material designation			Composition in % (m/m)							
Symbol	Number		Element	Cu	Ag	Bi	O	P	Other elements (see note)	
	unwrought copper	wrought copper							total	excluding
CuAg0,04	CR011A	CW011A	min. max.	Rem. –	0,03 0,05	– 0,000 5	– 0,040	– –	– 0,03	Ag, O
CuAg0,07	CR012A	CW012A	min. max.	Rem. –	0,06 0,08	– 0,000 5	– 0,040	– –	– 0,03	Ag, O
CuAg0,10	CR013A	CW013A	min. max.	Rem. –	0,08 0,12	– 0,000 5	– 0,040	– –	– 0,03	Ag, O
CuAg0,04P	CR014A	CW014A	min. max.	Rem. –	0,03 0,05	– 0,000 5	– – ¹⁾	0,001 0,007	– 0,03	Ag, P
CuAg0,07P	CR015A	CW015A	min. max.	Rem. –	0,06 0,08	– 0,000 5	– – ¹⁾	0,001 0,007	– 0,03	Ag, P
CuAg0,10P	CR016A	CW016A	min. max.	Rem. –	0,08 0,12	– 0,000 5	– – ¹⁾	0,001 0,007	– 0,03	Ag, P
CuAg0,04(OF)	CR017A	CW017A	min. max.	Rem. –	0,03 0,05	– 0,000 5	– – ¹⁾	– –	– 0,006 5	Ag, O
CuAg0,07(OF)	CR018A	CW018A	min. max.	Rem. –	0,06 0,08	– 0,000 5	– – ¹⁾	– –	– 0,006 5	Ag, O
CuAg0,10(OF)	CR019A	CW019A	min. max.	Rem. –	0,08 0,12	– 0,000 5	– – ¹⁾	– –	– 0,006 5	Ag, O

¹⁾ The oxygen content shall be controlled by the manufacturer so that the material conforms to the hydrogen embrittlement requirements of EN 1976.

NOTE: The total of other elements (than copper) is defined as the sum of Ag, As, Bi, Cd, Co, Cr, Fe, Mn, Ni, O, P, Pb, S, Sb, Se, Si, Sn, Te and Zn, subject to the exclusion of any individual elements indicated.

Table 2: Composition of copper alloys, low alloyed (less than 5 % alloying elements)

Material designation		Composition in % (m/m)																Density ρ g/cm ³ approx.			
Symbol	Number	Element	Cu	Al	Be	Co	Cr	Fe	Mn	Ni	P	Pb	S	Si	Sn	Te	Zn	Zr	Others total		
CuBe1,7	CW100C	min.	Rem.	-	1,6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8,3
		max.	-	-	1,8	0,3	-	0,2	-	0,3	-	-	-	-	-	-	-	-	-	0,5	
CuBe2	CW101C	min.	Rem.	-	1,8	-	-	0,2	-	0,3	-	-	-	-	-	-	-	-	-	-	8,3
		max.	-	-	2,1	0,3	-	0,2	-	0,3	-	-	-	-	-	-	-	-	-	0,5	
CuBe2Pb	CW102C	min.	Rem.	-	1,8	-	-	0,2	-	0,3	-	0,2	-	-	-	-	-	-	-	-	8,3
		max.	-	-	2,0	0,3	-	0,2	-	0,3	-	0,6	-	-	-	-	-	-	-	0,5	
CuCo1Ni1Be	CW103C	min.	Rem.	-	0,4	0,8	-	0,2	-	0,8	-	-	-	-	-	-	-	-	-	-	8,8
		max.	-	-	0,7	1,3	-	0,2	-	1,3	-	-	-	-	-	-	-	-	-	0,5	
CuCo2Be	CW104C	min.	Rem.	-	0,4	2,0	-	0,2	-	0,3	-	-	-	-	-	-	-	-	-	-	8,8
		max.	-	-	0,7	2,8	-	0,2	-	0,3	-	-	-	-	-	-	-	-	-	0,5	
CuCr1	CW105C	min.	Rem.	-	-	-	0,5	-	-	-	-	-	-	-	-	-	-	-	-	-	8,9
		max.	-	-	-	-	1,2	0,08	-	-	-	-	-	-	0,1	-	-	-	-	0,2	
CuCr1Zr	CW106C	min.	Rem.	-	-	-	0,5	-	-	-	-	-	-	-	0,1	-	-	-	0,03	-	8,9
		max.	-	-	-	-	1,2	0,08	-	-	-	-	-	-	0,1	-	-	-	0,3	0,2	
CuFe2P	CW107C	min.	Rem.	-	-	-	-	2,1	-	0,015	-	-	-	-	-	-	-	-	-	-	8,8
		max.	-	-	-	-	-	2,6	-	0,15	-	0,03	-	-	-	-	0,05	-	-	0,2	
CuNi1P	CW108C	min.	Rem.	-	-	-	-	-	-	0,8	-	-	-	-	-	-	-	-	-	-	8,9
		max.	-	-	-	-	-	-	-	1,2	-	-	-	-	-	-	0,20	-	-	0,2	
CuNi1Si	CW109C	min.	Rem.	-	-	-	-	-	-	1,0	-	-	-	-	0,4	-	-	-	-	-	8,8
		max.	-	-	-	-	-	0,2	0,1	1,6	-	0,02	-	-	0,7	-	-	-	-	0,3	
CuNi2Be	CW110C	min.	Rem.	-	0,2	-	-	-	-	1,4	-	-	-	-	-	-	-	-	-	-	8,8
		max.	-	-	0,6	0,3	-	0,2	-	2,4	-	-	-	-	-	-	-	-	-	0,5	
CuNi2Si	CW111C	min.	Rem.	-	-	-	-	-	-	1,6	-	-	-	-	0,4	-	-	-	-	-	8,8
		max.	-	-	-	-	-	0,2	0,1	2,5	-	0,02	-	-	0,8	-	-	-	-	0,3	
CuNi3Si1	CW112C	min.	Rem.	-	-	-	-	-	-	2,6	-	-	-	-	0,8	-	-	-	-	-	8,8
		max.	-	-	-	-	-	0,2	0,1	4,5	-	0,02	-	-	1,3	-	-	-	-	0,5	
CuPb1P	CW113C	min.	Rem.	-	-	-	-	-	-	0,003	-	0,7	-	-	-	-	-	-	-	-	8,9
		max.	-	-	-	-	-	-	-	0,012	-	1,5	-	-	-	-	-	-	-	0,1	
CuSP	CW114C	min.	Rem.	-	-	-	-	-	-	0,003	-	-	0,2	-	-	-	-	-	-	-	8,9
		max.	-	-	-	-	-	-	-	0,012	-	-	0,7	-	-	-	-	-	-	0,1	
CuSi1	CW115C	min.	Rem.	-	-	-	-	-	-	-	-	-	-	0,8	-	-	-	-	-	-	8,8
		max.	-	0,02	-	-	-	0,8	-	0,7	-	0,05	-	-	2,0	-	1,5	-	-	0,5	

(continued)

Table 2 (concluded)

Material designation		Composition in % (m/m)																Density ¹⁾ g/cm ³ approx.		
Symbol	Number	Element	Cu	Al	Be	Co	Cr	Fe	Mn	Ni	P	Pb	S	Si	Sn	Te	Zn	Zr	Others total	
CuSi3Mn1	CW116C	min.	Rem.	—	—	—	—	—	0,7	—	—	—	—	2,7	—	—	—	—	—	—
		max.	—	0,05	—	—	—	0,2	1,3	—	0,05	0,05	—	—	3,2	—	0,4	—	—	0,5
CuSn0,15	CW117C	min.	Rem.	—	—	—	—	0,02	—	—	—	—	—	—	0,10	—	—	—	—	—
		max.	—	—	—	—	—	—	—	—	0,015	—	—	—	0,15	—	0,10	—	—	0,10
CuTeP	CW118C	min.	Rem.	—	—	—	—	—	—	—	0,003	—	—	—	—	0,4	—	—	—	—
		max.	—	—	—	—	—	—	—	—	0,012	—	—	—	—	0,7	—	—	—	0,1
CuZn0,5	CW119C	min.	Rem.	—	—	—	—	—	—	—	—	—	—	—	—	—	0,1	—	—	—
		max.	—	—	—	—	—	—	—	—	0,02	—	—	—	—	—	1,0	—	—	0,1
CuZr	CW120C	min.	Rem.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0,1	—	—
		max.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0,2	—	0,1

¹⁾ For information only

STANDARD PREVIEW
(standards.iteh.ai)
SIST CR 13388:1999
<https://standards.iteh.ai/catalog/standards/sist/756899a-a4a5-43a2-b6b9-8108c993431/sist-cr-13388-1999>