STANDARDISERINGEN I SVERIGE
SWEDISH STANDARDS INSTITUTION

SVENSK STANDARD SS-EN 1254-5

Handläggande organ	Fastställd	Utgåva	Sida
SVENSK MATERIAL- & MEKANSTANDARD, SMS	1998-07-31	1	1 (1+14)

Copper and copper alloys – Plumbing fittings – Part 5: Fittings with short ends for capillary brazing to copper tubes

The European Standard EN 1254-5:1998 has the status of a Swedish Standard. This document contains the official English version of EN 1254-5:1998.

This standard, together with SS-EN 1254-1, supersedes the Swedish Standard SMS 3209.

Swedish Standards corresponding to documents referred to in this Standard are listed in ”Catalogue of Swedish Standards”, issued by SIS. The Catalogue lists, with reference number and year of Swedish approval, International and European Standards approved as Swedish Standards as well as other Swedish Standards.

Koppar och kopparlegeringar – Rördelar – Del 5: Kapillärlödrördelar med kort hylsa för kopparrör

Europastandarden EN 1254-5:1998 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 1254-5:1998.

Standarden, tillsammans med SS-EN 1254-1, ersätter SMS 3209.

Motsvarigheten och aktualiteten i svensk standard till de publikationer som omnämns i denna standard framgår av ”Katalog över svensk standard”, som ges ut av SIS. I katalogen redovisas internationella och europeiska standarder som fastställts som svenska standarder och övriga gällande svenska standarder.

ICS 23.040.40

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1254-5

January 1998

ICS 23.040.40
Descriptors: Copper tubes, copper, copper alloys, pipe fittings, connections for welding, joining, dimensions, dimensional tolerances, design, manufacturing, tests, designation, marking

English version

Copper and copper alloys – Plumbing fittings – Part 5: Fittings with short ends for capillary brazing to copper tubes

Cuivre et alliages de cuivre – Raccords – Partie 5: Raccords à emboîture courte pour brasure forte par capillarité pour tubes en cuivre

Kupfer und Kupferlegierungen – Fittings – Teil 5: Fittings mit geringer Einstecktiefe zum Verbinden mit Kupferrohren durch Kapillar-Hartlöten

This European Standard was approved by CEN on 24 November 1997.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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

Ref. No. EN 1254-5:1998 E

Foreword

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

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 1998, and conflicting national standards shall be withdrawn at the latest by July 1998.

Within its programme of work, Technical Committee CEN/TC 133 requested CEN/TC 133/WG 8, Copper and copper alloy fittings, to prepare the following standard:

EN 1254-5, *Copper and copper alloys — Plumbing fittings — Part 5: Fittings with short ends for capillary brazing to copper tubes.*

This standard is one of five parts for copper and copper alloy fittings for joining copper tubes or plastics pipes. The other four parts of the standard are:

EN 1254-1, *Copper and copper alloys — Plumbing fittings — Part 1: Fittings with ends for capillary soldering or capillary brazing to copper tubes.*

EN 1254-2, *Copper and copper alloys — Plumbing fittings — Part 2: Fittings with compression ends for use with copper tubes.*

EN 1254-3, *Copper and copper alloys — Plumbing fittings — Part 3: Fittings with compression ends for use with plastics pipes.*

EN 1254-4, *Copper and copper alloys — Plumbing fittings — Part 4: Fittings combining other end connections with capillary or compression ends.*

It is recommended that fittings manufactured to this standard are certified as conforming to the requirements of this standard based on third party testing and continuing surveillance, which should be coupled with an assessment of a supplier's quality system against the appropriate standard, i.e. EN ISO 9001 or EN ISO 9002.

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this standard:

1) this standard provides no information as to whether the product may be used without restriction in any of the Member States of the EU or EFTA;

2) it should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or characteristics of this product remain in force.

The attention of the user of this standard is drawn to the fact that national or local regulations or practices might restrict the choice of dimensions and threads in the application of products conforming to this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Contents

1 Scope

This European Standard specifies materials, assembly dimensions and tolerances and test requirements for fittings of copper and copper alloys with or without plating. Maximum permissible temperatures and pressures are also established. This Part of EN 1254 specifies connection end dimensions of short cup ends suitable only for brazing, for the purposes of joining copper tubes specified in EN 1057. Fittings may comprise a combination of any of the end types specified in EN 1254-1 to EN 1254-5 or other standards.

The standard establishes a designation system for the fittings.

2 Normative references

This European Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

EN 723, *Copper and copper alloys — Combustion method for determination of carbon on the inner surface of copper tubes or fittings.*

EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications.*

EN 1254-1, *Copper and copper alloys — Plumbing fittings — Part 1: Fittings with ends for capillary soldering or capillary brazing to copper tubes.*

EN 1254-2, *Copper and copper alloys — Plumbing fittings — Part 2: Fittings with compression ends for use with copper tubes.*

EN 1254-3, *Copper and copper alloys — Plumbing fittings — Part 3: Fittings with compression ends for use with plastics pipes.*

EN 1254-4, *Copper and copper alloys — Plumbing fittings — Part 4: Fittings combining other end connections with capillary or compression ends.*

EN ISO 6509:1995, *Corrosion of metals and alloys — Determination of dezincification resistance of brass.* (ISO 6509:1981)

ISO 6957, *Copper alloys — Ammonia test for stress corrosion resistance.*

NOTE Informative references to documents used in the preparation of this standard, and cited at the appropriate places in the text, are listed in a bibliography, see annex C.

3 Definitions

For the purposes of this standard, the following definitions apply.

3.1

plumbing fitting

device used in a tube system for the purpose of connecting the tubes either to each other or to a component part of a system

3.2

capillary end

end in which the joint is made by the flow of brazing alloy by capillary action into the annular space

3.3

reducer (short end for capillary brazing to copper tube)

component used to enable an end to connect tube of a smaller nominal diameter than the nominal diameter of the fitting end

3.4

adaptor fitting

fitting combining more than one type of end

NOTE For details of the other ends, see the relevant parts of this standard or other standards.

3.5

nominal diameter

nominal diameter of the fitting end expressed as the nominal outside diameter of the connecting tube

4 Requirements

4.1 General

Fittings shall conform to the requirements of **4.2** to **4.5** and shall be capable of meeting the type testing requirements of **4.6**. Reducers also shall conform to these requirements.

4.2 Materials

4.2.1 *General*

Fittings shall be made from copper or copper alloys selected from materials either:

— specified in European copper and copper alloy product standards; or

— registered by CEN/TC 133;

provided that the fittings manufactured from them meet the functional requirements of this standard.

NOTE Some of the standardized coppers and copper alloys commonly used for the manufacture of fittings are shown in Table 1. Details of registered alloys can be obtained from the CEN/TC 133 Secretariat.

Table 1 — Examples of commonly used materials

Material designation		Standard
Symbol	Number	
Cu-DHP	CW024A	prEN 12449
CuSn5Zn5Pb5-C	CC491K	prEN 1982
CuZn39Pb3	CW614N	EN 12164
CuZn33Pb2-C	CC750S	prEN 1982

NOTE These examples do not constitute an exhaustive list.

4.2.2 *Choice of materials*

Cu-ETP (CW004A) is not a permitted material for brazing fittings and shall not be used for their manufacture.

4.3 Dimensions and tolerances

4.3.1 *Tolerances on diameters*

The standardized nominal dimensions; diameters and their tolerances, are given in Table 2.

The socket and male end tolerances on diameter shall be in accordance with Table 2, which shall be verified by the use of gauges shown in Figures 5 and 6 and Tables 7 and 8.

NOTE 1 Tolerances in accordance with Table 2 and the use of gauges in accordance with Tables 7 and 8 will ensure the distribution of brazing alloy throughout the joint and will allow for the alignment of the male end of a fitting or the free end of a tube in the socket.

NOTE 2 When capillary fittings are used for brazing to copper tubes, the ends of the tubes should be sized to the outside diameter dimensions specified in Table 2 for a length not less than the length of engagement of the fitting.

NOTE 3 Socket and male ends are shown diagrammatically in Figures 1 and 2.

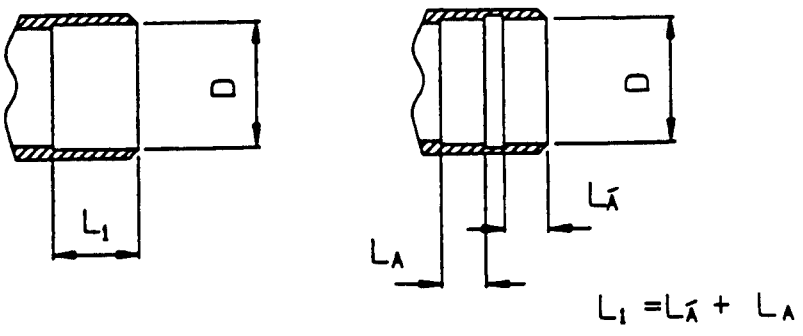
NOTE 4 The installation dimensions cannot be standardized due to varying manufacturing processes. The manufacturer should be consulted for these dimensions.

Table 2 — Tolerances on the nominal diameter

Values in millimetres

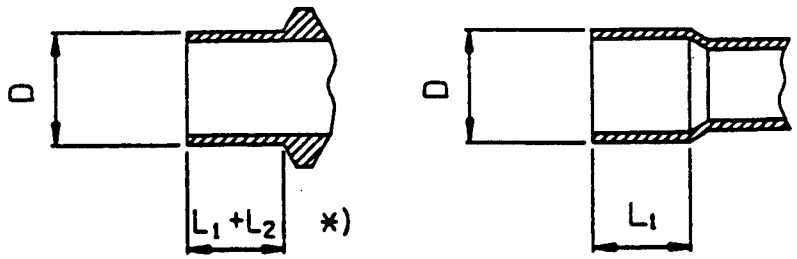
Nominal diameter D	Tolerances on the mean diameter[1] with respect to the nominal diameter D		Resulting diametrical difference	
	Outside diameter of male end	Inside diameter of socket	Max.	Min.
14,7; 15; 16; 18	+0,04 −0,05	+0,15 +0,06	0,20	0,02
21; 22; 25; 27,4; 28	+0,05 −0,06	+0,18 +0,07	0,24	0,02
34; 35; 40; 40,5; 42; 53,6; 54[2]	+0,06 −0,07	+0,23 +0,09	0,30	0,03
64; 66,7; 70; 76,1; 80; 88,9; 106; 108[2]	+0,07 −0,08	+0,33 +0,10	0,41	0,03
[2]133; 159	+ 0,20 −0,20	+0,70 +0,23	0,90	0,03

[1] Arithmetical mean of two diameters at right angles in a cross-section taken anywhere on the length of the socket or of the male end.
[2] The brazing of tubes and fittings for these diameters requires special precautions regarding working practices.



a) b)

Figure 1 — Socket



a) b)

*) When the male end diameter is less than the fitting diameter, L_1 for the male end should be increased by L_2 (see Table 3).

Figure 2 — Male end

4.3.2 *Minimum lengths of engagement*

The minimum lengths of engagement of sockets and male ends shall be in accordance with Table 3.

The length L_1 for integral brazing ring fittings shall not include the width of the brazing alloy groove [see Figure 1 b)].

Male ends intended for use with integral ring sockets shall include an allowance for the width of the brazing alloy groove.

4.3.3 *Minimum bore area*

The minimum cross-sectional area of the bore through each fitting shall be not less than the theoretical minimum area of the bore given in Table 4, except that for unequal-ended or adaptor fittings with ends specified in EN 1254-1, EN 1254-2, EN 1254-3 and EN 1254-4 or other standards, the smallest diameter shall apply provided that this diameter does not restrict other outlets.

Table 3 — Minimum lengths of engagement

Dimensions in millimetres

Nominal diameter	Length of engagement	
D	L_1	L_2
14,7; 15; 16; 18	7	2
21; 22; 25	8	2
27,4; 28	9	2
34; 35; 40; 40,5; 42	10	2
53,6; 54	11	2
64; 66,7	11	3
70; 76,1	12	3
80	13	3
88,9	14	3
106; 108	15	4
133	19	5
159	21	5

Table 4 — Minimum bore

Dimensions in millimetres

Nominal diameter *D*	Minimum bore
14,7	11,0
15	11,0
16	12,0
18	14,0
21	18,0
22	18,0
25	21,0
27,4	23,0
28	23,0
34	29,0
35	29,0
40	35,0
40,5	36,0
42	36,0
53,6	47,0
54	47,0
64	55,0
66,7	57,0
70	60,0
76,1	65,0
80	68,0
88,9	76,0
106	92,0
108	92,0
133	113,0
159	135,0

4.3.4 *Minimum wall thickness*

Minimum wall thickness measured at any point shall be in accordance with dimension, *e*, in Table 5 (see Figure 3). The minimum wall thickness requirements do not apply under indented marking on the socket end.

In the case of integral brazing ring fittings where a groove is made within the brazing length, the minimum wall thickness shall be in accordance with dimension, *e'*, in Table 5 (see Figure 3).

4.3.5 *Tolerance for the alignment of the fitting ends*

The alignment of the ends of the fitting shall be within 2° of the specified axis.

4.4 Design and manufacture

4.4.1 *Maximum temperatures and pressures*

Temperatures and pressures for assembled joints shall not exceed the values in Table 6 for the relevant brazing alloy.

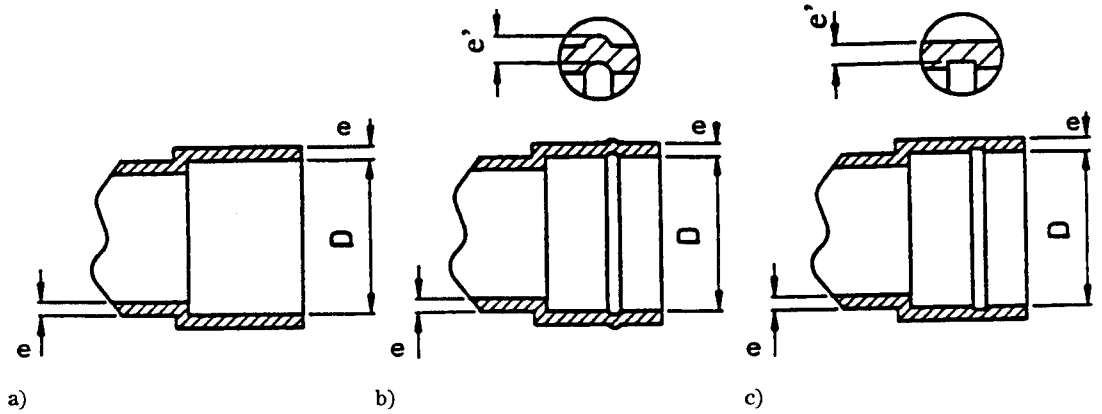


Figure 3 — Minimum wall thickness