



SLOVENSKI STANDARD

SIST EN 1254-20:2021+A1:2025

01-april-2025

Baker in bakrove zlitine - Fitingi - 20. del: Definicije, mere navojev, preskusne metode, referenčni podatki in dodatne informacije (vključno z dopnilom A1)

Copper and copper alloys - Plumbing fittings - Part 20: Definitions, thread dimensions, test methods, reference data and supporting information

Kupfer und Kupferlegierungen - Fittings - Teil 20: Definitionen, Gewindemaße, Prüfverfahren, Referenzdaten und ergänzende Informationen

Cuivre et alliages de cuivre - Raccords - Partie 20 : Définitions, dimensions de filetage, méthodes d'essai, données de référence et informations complémentaires

Ta slovenski standard je istoveten z: EN 1254-20:2021+A1:2025

[SIST EN 1254-20:2021+A1:2025](http://standards.sist.si/catalog/standards/sist/0070371/1000-1000-0071-020220/EN/SIST-EN-1254-20-2021+A1-2025)

<http://standards.sist.si/catalog/standards/sist/0070371/1000-1000-0071-020220/EN/SIST-EN-1254-20-2021+A1-2025>

ICS:

23.040.40	Kovinski fittingi	Metal fittings
77.150.30	Bakreni izdelki	Copper products

SIST EN 1254-20:2021+A1:2025 **en,fr,de**

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 1254-20:2021+A1

February 2025

ICS 23.040.40

Supersedes EN 1254-20:2021

English Version

Copper and copper alloys - Plumbing fittings - Part 20: Definitions, thread dimensions, test methods, reference data and supporting information

Cuivre et alliages de cuivre - Raccords - Partie 20 :
Définitions, dimensions de filetage, méthodes d'essai,
données de référence et informations complémentaires

Kupfer und Kupferlegierungen - Fittings - Teil 20:
Definitionen, Gewindemaße, Prüfverfahren,
Referenzdaten und ergänzende Informationen

This European Standard was approved by CEN on 23 November 2020 and includes Amendment 1 approved by CEN on 5 December 2024.

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 CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

<https://standards.iteh.ai/catalog/standards/sist/0b9efb14-486c-4c0e-8e91-c62c22ef4d5e/sist-en-1254-20-2021a1-2025>



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	5
1 Scope	6
2 Normative references	6
3 Terms and definitions	7
4 Thread dimensions.....	10
4.1 Wall thickness at threaded portions of fittings.....	10
4.2 Dimensions of tail pipe ends for swivel fittings.....	11
4.3 Dimensions of gas union connectors.....	13
4.4 Threaded end dimensions.....	14
4.5 Minimum bore and cross-sectional area of fittings	20
5 Test method for leak tightness under internal hydrostatic pressure.....	24
5.1 Introduction	24
5.2 Principle	25
5.3 Apparatus.....	25
5.4 Test piece	25
5.5 Procedure.....	26
6 Test method for leak tightness under internal pneumatic pressure	26
6.1 Introduction	26
6.2 Principle	26
6.3 Apparatus.....	27
6.4 Test piece	27
6.5 Procedure.....	28
7 Integrity of fabricated fitting bodies or having an 'as cast' microstructure	29
7.1 Introduction	29
7.2 Principle	29
7.3 Apparatus.....	29
7.4 Test piece	29
7.5 Procedure.....	30
8 Test method for resistance to pull out of joints to metallic tubes.....	30
8.1 Introduction	30
8.2 Principle	30
8.3 Apparatus.....	30
8.4 Test assembly	31
8.5 Procedure.....	31
9 Test method for the resistance of joints with metallic tube to vibration	31
9.1 Introduction	31
9.2 Principle	31
9.3 Apparatus.....	32
9.4 Test assembly	32
9.5 Procedure.....	33
10 Test method for the resistance of joints to static flexural force	33
10.1 Introduction	33
10.2 Principle	33

10.3	Apparatus	33
10.4	Test piece	33
10.5	Procedure	34
11	Test method for leak tightness of joints under vacuum	35
11.1	Introduction	35
11.2	Principle	35
11.3	Apparatus	35
11.4	Test piece	36
11.5	Procedure	36
12	Test method for the resistance of joints to temperature cycling (liquid applications)	37
12.1	Introduction	37
12.2	Principle	37
12.3	Apparatus	37
12.4	Test assembly	37
12.5	Procedure	39
13	Test method for the resistance of joints to temperature cycling (fuel gas applications)	39
13.1	Introduction	39
13.2	Principle	40
13.3	Apparatus	40
13.4	Test assembly	40
13.5	Procedure	40
14	Method for detecting non-pressed fitting ends	41
14.1	Introduction	41
14.2	Principle	41
14.3	Apparatus	41
14.4	Test piece	42
14.5	Procedure	42
14.6	Results	42
15	Determination of resistance to stress corrosion	43
15.1	Introduction	43
15.2	Test piece	43
15.3	Procedure	43
15.4	Test report	43
16	Test method for detection of a carbon film on the surface of copper fittings	43
16.1	Preparation of the test piece	43
16.2	Procedure	43
16.3	Detection and assessment of films	44
17	Determination of mean depth of dezincification	44
17.1	Introduction	44
17.2	Procedure	44
17.3	Expression of results	44
18	Test method for the resistance of joints to pressure cycling	45
18.1	Introduction	45
18.2	Principle	45
18.3	Apparatus	45
18.4	Test pieces	47
18.5	Procedure	47
19	Test method for disconnection and re-use	48

EN 1254-20:2021+A1:2025 (E)

19.1	Introduction	48
19.2	Principle	48
19.3	Apparatus.....	48
19.4	Test assembly	48
19.5	Procedure.....	48
20	Method for determining if the diameter and/or the length of engagement of a capillary end is/are within the specified tolerance.....	48
20.1	Principle	48
20.2	Apparatus.....	49
20.3	Test piece	53
20.4	Procedure.....	53
20.5	Results.....	53
21	Method for determining the minimum length of engagement of an integral solder or brazing ring socket having a formed groove.....	53
21.1	Introduction	53
21.2	Principle	53
21.3	Apparatus.....	53
21.4	Test piece	54
21.5	Procedure.....	54
21.6	Results.....	54
22	[A1] Minimum wall thickness [A1]	55
Annex A (informative) Assembling instructions.....		56
Bibliography		64

iTab Standards
<https://standards.itech.ai>
 Document Preview

[SIST EN 1254-20:2021+A1:2025](https://standards.itech.ai/catalog/standards/sist/0b9efb14-486c-4c0e-8e91-c62c22ef4d5e/sist-en-1254-20-2021a1-2025)

<https://standards.itech.ai/catalog/standards/sist/0b9efb14-486c-4c0e-8e91-c62c22ef4d5e/sist-en-1254-20-2021a1-2025>

European foreword

This document (EN 1254-20:2021+A1:2025) 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 August 2025, and conflicting national standards shall be withdrawn at the latest by August 2025.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 5 December 2024.

This document supersedes A1 EN 1254-20:2021 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

A1 The need for an amendment was based on the following points:

- include a wall thickness table for copper alloy fittings used in systems according to EN ISO 15874, EN ISO 15875, EN ISO 15876, EN ISO 15877, EN ISO 21003 and EN ISO 22391. A1

This document is a supporting standard describing the test methods used by the other parts of the EN 1254 series.

EN 1254 comprises the following parts under the general title “Copper and copper alloys — Plumbing fittings”:

- *Part 1: Capillary fittings for soldering or brazing to copper tubes*
- *Part 2: Compression fittings for use with copper tubes*
- *Part 3: Compression fittings for use with plastics and multilayer pipes*
- *Part 4: Threaded fittings*
- *Part 5: Capillary fittings with short ends for brazing to copper tubes*
- *Part 6: Push-fit fittings for use with metallic tubes, plastics and multilayer pipes*
- *Part 7: Press fittings for use with metallic tubes*
- *Part 8: Press fittings for use with plastics and multilayer pipes*
- *Part 20: Definitions, thread dimensions, test methods, reference data and supporting information*

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 1254-20:2021+A1:2025 (E)**1 Scope**

This document contains definitions, thread dimension, reference data (minimum bore A_1) and wall thickness (A_1), supporting information (assembling instructions) and describes the test methods referenced by other parts of the EN 1254 series.

Thread dimensions comprise: wall thickness at threaded portions of fittings, dimensions of tail pipe ends for swivel fittings, dimensions of gas union connectors, thread dimensions and thread profile.

Test methods comprise: leak tightness under internal hydrostatic pressure, leak tightness under internal pneumatic pressure, integrity of fabricated fitting bodies or having an 'as cast' microstructure, resistance to pull out of joints to metallic tubes, resistance of joints with metallic tube to vibration, resistance of joints to static flexural force, leak tightness of joints under vacuum, the resistance of joints to temperature cycling, detecting non-pressed fitting ends, resistance to stress corrosion, detection of a carbon film on the surface of copper fittings, determination of mean depth of dezincification, resistance of joints to pressure cycling, disconnection and re-use, determining if the diameter and/or the length of engagement of a capillary end is/are within the specified tolerance, determining the minimum length of engagement of an integral solder or brazing ring socket having a formed groove.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 723, *Copper and copper alloys - Combustion method for determination of the carbon content 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 1333:2006, *Flanges and their joints - Pipework components - Definition and selection of PN*

EN 10226-1, *Pipe threads where pressure tight joints are made on the threads - Part 1: Taper external threads and parallel internal threads - Dimensions, tolerances and designation*

EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation (ISO 228-1)*

EN ISO 6509-1:2014, *Corrosion of metals and alloys - Determination of dezincification resistance of copper alloys with zinc - Part 1: Test method (ISO 6509-1:2014)*

EN ISO 6708:1995, *Pipework components - Definition and selection of DN (nominal size) (ISO 6708:1995)*

EN ISO 21003-1:2008, *Multilayer piping systems for hot and cold water installations inside buildings - Part 1: General (ISO 21003-1:2008)*

ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation*

ISO 7-2, *Pipe threads where pressure-tight joints are made on the threads - Part 2: Verification by means of limit gauges*

ISO 2859-1:1999, *Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 6957:1988, *Copper alloys - Ammonia test for stress corrosion resistance*

3 Terms and definitions

For the purposes of this document and other parts of the EN 1254 series, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1

plumbing fitting

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

3.2

capillary end

end in which the joint is made by the flow of solder or brazing alloy by capillary action into the annular space between the capillary end and its connecting part

3.3

end feed fitting

EF

plumbing fitting including one or more capillary ends where the solder or brazing alloy for the capillary action is introduced externally into the annular space when a connection is made

3.4

integral solder ring fitting

ISR

plumbing fitting including one or more capillary ends that contains the solder alloy needed to make the connection

3.5

integral brazing ring fitting

IBR

plumbing fitting including one or more capillary ends that contains the brazing alloy needed to make the connection

3.6

socket

type of end defined by its internal diameter

3.7

male end

type of end defined by its external diameter

3.8

compression end

end in which a mechanical joint is formed by the tightening of a nut to compress a ring or sleeve onto the outside wall of the tube, or clamp a flared portion of the tube to the body of a fitting

EN 1254-20:2021+A1:2025 (E)**3.8.1****compression end, Type A, non manipulative**

end that requires no preparation of the ends of the tube or pipe other than that they are cut square and deburred, or chamfered when specified, and in which the joint is made by the compression of a ring or sleeve onto the outside wall of the tube or pipe with or without additional sealing elements and with or without an internal tube support

Note 1 to entry: The sealing element may be metallic or non-metallic.

3.8.2**compression end, Type B, manipulative**

end that requires forming of the tube or pipe at its end, and in which the joint is made by compressing the formed portion of the tube or pipe against the formed end of the fitting or a loose ring or sleeve within the fitting/tube/pipe

3.9**union end**

end which enables connection and disconnection with minimal disturbance of other pipe sections

Note 1 to entry: Union ends can be sphere to cone, cone to cone, cone to radius or flat face with a sealing member.

Note 2 to entry: Component parts of union ends from different manufacturers should not be regarded as interchangeable.

3.10**interface thread**

end that has male or female jointing or fastening thread, used to connect with a corresponding threaded pipe or fitting

3.11**jointing thread**

thread on a fitting end in which the joint is made pressure tight on the thread

3.12**fastening thread**

thread to provide mechanical assembly of a joint in which the seal is not made on the thread

3.13**push-fit end**

end which incorporates a sealing element and a gripping device

Note 1 to entry: The joint is made by pushing the tube into the fitting and a seal is achieved without the use of heat or tools.

Note 2 to entry: In some designs, this type of joint can be disconnected and re-connected or disconnected and the fitting re-used elsewhere.

3.14**supporting sleeve**

device permanently inserted in the tube end to provide internal support for low strength tube or pipe materials

A1 Note 1 to entry: The supporting sleeve may be a part of the fitting that sits within the bore of the pipe or tube, or a separate component. **A1**

3.15**press connection**

press end in which the joint is effected by the compression and permanent deformation of the ends of the fitting and/or the tube or male end of a fitting with a pressing tool

3.15.1**radial press end**

press end in which the joint is effected by radial compression of the ends of the fitting and the tube with a pressing tool

3.15.2**axial press end**

press end in which the joint is effected by axial movement of a compression sleeve with a tool to compress the ends of the fitting and the tube

3.15.3**compression sleeve**

sleeve moved along the axis of a pipe to compress a fitting end

3.16**pressing tools and jaws**

mechanical device which, by closing jaws, either directly or indirectly (axial press end) causes radial compression of the plumbing fitting end onto the connecting tube

3.17**reducer**

fitting or an adaptor used to enable connections between pipework components of different nominal diameters

3.18**adaptor fitting**

fitting combining more than one type of end

3.19**nominal diameter**

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

3.20**multilayer pipe**

pipe comprising more than one layer, see definitions according to EN ISO 21003-1:2008, 3.1.1, 3.1.2 and 3.1.3

3.21**fuel gas**

combustible gases which are gaseous at 15 °C and 1 013 mbar and are generally odorized for safety reasons, are commonly referred to as manufactured gas, natural gas or liquefied petroleum gases (LPG)

Note 1 to entry: They are also referred to as first, second or third family gases (see EN 437:2018, Table 1).

EN 1254-20:2021+A1:2025 (E)**3.22****maximum operating pressure****MOP**

maximum operating pressure at which pipework intended for fluids can be operated under normal operating conditions

3.23**PN**

alphanumeric designation used for reference purposes related to a combination of mechanical and dimensional characteristics of a component of a pipework system

Note 1 to entry: It comprises the letters PN followed by a dimensionless number.

Note 2 to entry: The maximum allowable pressure of a pipework component depends on the PN number, the material and design of the component, its maximum allowable temperature, etc.

[SOURCE: EN 1333:2006, 2.1]

3.24**AQL**

Acceptance Quality Limit (AQL) is defined in ISO 2859-1:1999, Table I and IIA

3.25**DN**

alphanumeric designation of size for components of a pipework system, which is used for reference purposes. It comprises the letters DN followed by a dimensionless whole number which is indirectly related to the physical size, in millimetres, of the bore or outside diameter of the end connections

[SOURCE; EN ISO 6708:1995, 2.1]

4 Thread dimensions**4.1 Wall thickness at threaded portions of fittings**

The minimum wall thickness at threaded portions of fittings, see Figure 1, shall be as expressed in Table 1 for the relevant diameters.

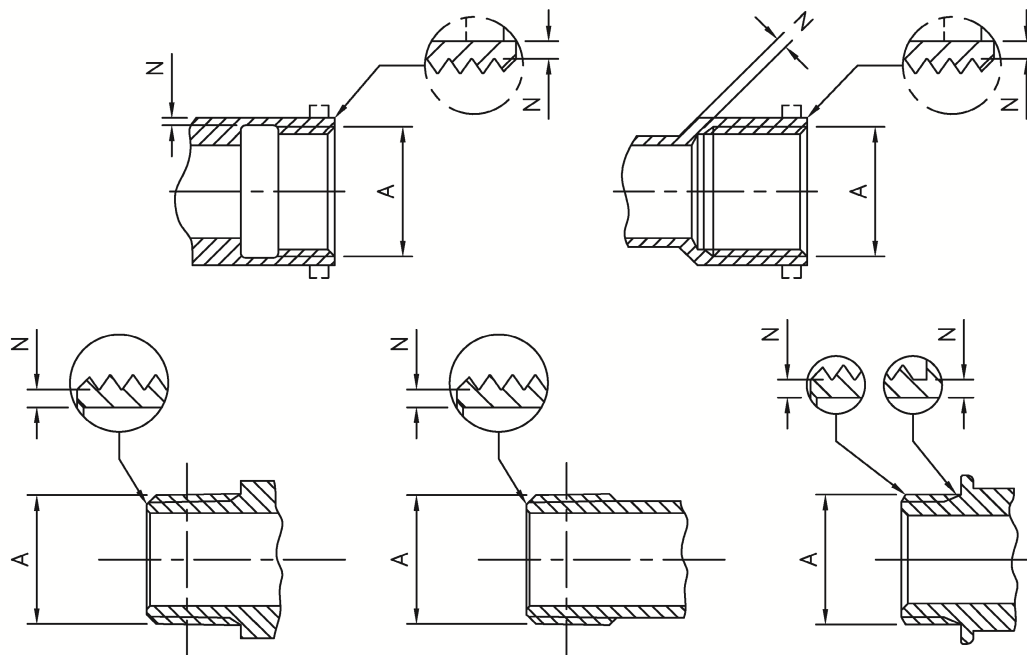


Figure 1 — Minimum wall thickness at threaded portions of fittings

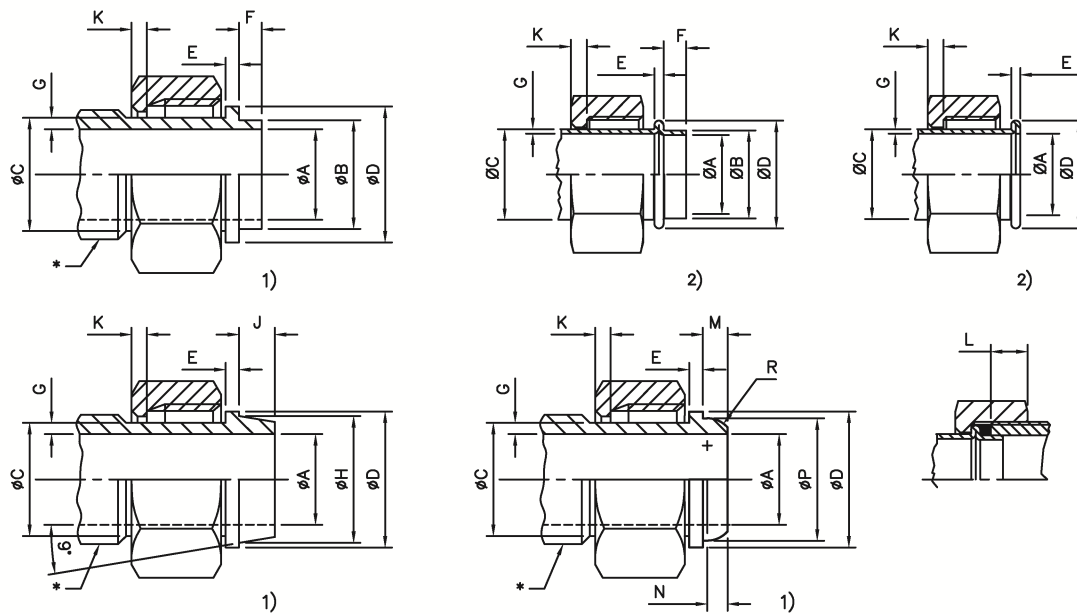
Table 1 — Minimum wall thickness at threaded portions of fittings

Thread designation	Minimum wall thickness of fitting <i>N</i>	
	Wrought coppers and copper alloys and continuously cast bar mm	Cast coppers and copper alloys mm
1/8	1,0	1,0
1/4	1,0	1,0
3/8	1,1	1,1
1/2	1,2	1,2
3/4	1,4	1,5
1	1,5	1,8
1 1/4	1,6	1,8
1 1/2	1,8	2,0
2	1,9	2,3
2 1/2	2,0	2,4
3	2,3	2,6
4	2,8	2,9

4.2 Dimensions of tail pipe ends for swivel fittings

The dimensions of tail pipe ends for swivel fittings, see Figure 2, shall be as expressed in Table 2 for the relevant thread size.

EN 1254-20:2021+A1:2025 (E)



Key

- 1 wrought or cast alloy body
2 drawn tubular body

Figure 2 — Tail pipe ends for swivel fittings

Table 2 — Dimensions of tail pipe ends for swivel fittings

Dimension	A		B		C		D		E		F		G	
	Min. (Wrought or drawn tube)	Min. (casting)	Max.	Max.	Max.	Min.	Min. (Wrought or cast)	Min. (Draw tube)	Max.	Min.	Min. (Draw tube)	Min. (Wrought)	Min. (Casting)	
in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1/2	11,0	10,2	14,6	15,1	18,5	18,0	2,4	1,4	6,4	4,7	0,7	1,2	1,4	
3/4	16,1	15,3	19,8	20,0	24,0	23,5	2,4	1,8	6,4	4,7	0,9	1,4	1,6	
1	21,2	20,4	25,7	25,7	30,2	29,4	3,0	1,8	6,4	4,7	0,9	1,5	1,8	
1 1/4	25,4	25,4	34,0	33,6	38,9	38,0	3,3	2,0	8,0	6,3	1,0	1,6	1,9	
1 1/2	31,7	31,7	39,6	39,2	44,8	43,9	3,8	2,2	9,6	7,9	1,1	1,8	2,2	
2	44,4	43,7	50,8	50,7	56,6	55,4	4,0	2,4	9,6	7,9	1,2	2,0	2,3	
2 1/2	50,8	50,8	56,6	62,0	71,9	71,0	4,3	2,4	9,6	7,9	1,2	2,0	2,4	