UDC 669.3-422.11-124

DEUTSCHE NORMEN

July 1969

DIN 1756

Round Rod
of Copper and Wrought Copper Alloys
Drawn Dimensions

Rundstangen aus Kupfer und Kupfer-Knetlegierungen; gezogen, Maße

Dimensions in mm

No guarantee can be given in respect of this translation
In all cases the latest German-language version of this standard shall be taken as authoritative

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Translation
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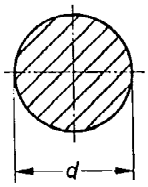
1. Scope

This Standard applies to drawn round rods of diameter from 0.5 to 80 mm made of the materials from materials groups I, II and III listed in Section 4.

2. Designation



Designation of a drawn round rod of diameter d = 22 mm made of the material having the symbol CuZn37 F30 (previously Ms63 F30) or the material number 2.0321.10:

Round 22 DIN 1756 - CuZn37 F30
or Round 22 DIN 1756 - 2.0321.10
previously Round 22 DIN 1756 - Ms63 F30

Instead of the denomination "round" being written out in full, the abbreviated form "Rd" according to DIN 1353 may also be adopted.

3. Dimensions and permissible variations

3.1. Diameter (see Table 1)

3.2. Permissible out-of-roundness

The out-of-roundness may not exceed one half of the listed permissible variation in the diameter.

3.3. Permissible variation from straightness

For rods of diameter d from 10 mm upwards in manufacturing, approximate and fixed lengths (but excluding rods in the soft condition) the following permissible variations from straightness are allowed (see Fig.):

for materials group I:

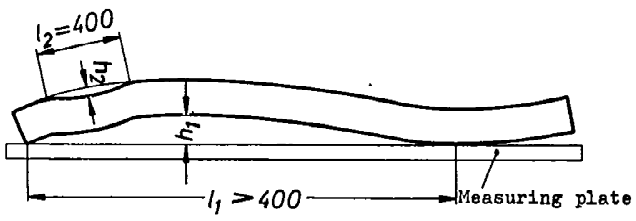
Permissible variation h_1 = 1 mm per m, increasing linearly over measured lengths l_1 exceeding 400 mm, e.g., h_1 = 3 mm for l_1 = 3 m. Over any length l_2 = 400 mm, the variation h_2 must not exceed 0.4 mm.

for materials group II:

2 times of the values, stated for group I.

for materials group III:

3 times of the values, stated for group I.



Continued on pages 2 to 4

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Table 1. Diameter

Preferred dimensions[1]	Dimension ranges[2]	Diameter d Permissible variations for materials group I (h10)[3]	II (h11)[3]	III (h12)[3]	Cross-section mm²	Weight[4] kg/m
0,5	from 0,5 to 3	-0,04	-0,06	Rods not commercially available	0,196	0,00175
0,6					0,283	0,00252
0,8					0,503	0,00447
1					0,785	0,00699
1,2					1,131	0,0101
1,4					1,539	0,0137
1,6					2,011	0,0179
1,8					2,545	0,0226
2					3,142	0,0279
2,2					3,801	0,0338
2,5					4,909	0,0437
2,8					6,158	0,0548
3					7,069	0,0629
3,5	over 3 to 6	-0,05	-0,08	-0,12	9,621	0,0856
4					12,57	0,112
4,5					15,90	0,141
5					19,64	0,175
5,5					23,76	0,211
6					28,27	0,252
6,5	over 6 to 10	-0,06	-0,09	-0,15	33,18	0,295
7					38,48	0,342
8					50,27	0,447
9					63,62	0,566
10					78,54	0,699
11	over 10 to 18	-0,07	-0,11	-0,18	95,03	0,846
12					113,1	1,01
14					153,9	1,37
16					201,1	1,79
18					254,5	2,26
20	over 18 to 30	-0,08	-0,13	-0,21	314,2	2,79
22					380,1	3,38
25					490,9	4,37
28					615,8	5,48
32	over 30 to 50	-0,10	-0,16	-0,25	804,2	7,16
36					1018	9,06
40					1257	11,2
45					1590	14,1
50					1964	17,5
56	over 50 to 80	-0,12	-0,19	-0,30	2463	21,9
60					2827	25,2
63					3117	27,7
70					3848	34,2
75					4418	39,3
80					5027	44,7

1) Preferably from Series R_a 20 DIN 323

2) Within the dimension ranges, intermediate dimensions according to Series R 40 DIN 323 are to be preferred.

3) The permissible variations indicated for h10, h11 and h12 have been rounded to 2 decimal places according to DIN 1333.

4) Calculated at a density of 8.9 kg/dm³. For materials having a different density, the weights should be calculated by using the conversion factors in Tables 2 to 4 (see also Section 6).

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Table 2. Materials group I

Denomination	Symbol new	Symbol previously	Material number	Density kg/dm³	Conversion factor
Copper-zinc alloys (brass)	CuZn36Pb1	Ms63Pb	2.0330	8,5	0,955
	CuZn36Pb3	—	2.0375	8,5	0,955
	CuZn38Pb1	Ms60Pb	2.0370	8,4	0,944
	CuZn39Pb2	Ms58 5)	2.0380	8,4	0,944
	CuZn39Pb3		2.0401	8,5	0,955
	CuZn40Pb2		2.0402	8,4	0,944
	CuZn40Pb3		2.0405	8,5	0,955
Wrought copper alloys, low alloyed	CuSP		2.1498	8,9	1
	CuTeP	SF-CuTe	2.1546	8,9	1

Table 3. Materials group II

Denomination	Symbol new	Symbol previously	Material number	Density kg/dm³	Conversion factor
Copper	D-Cu		2.0100	8,9	1
	F-Cu		2.0080	8,9	1
	E-Cu		2.0060	8,9	1
	SD-Cu		2.0110	8,9	1
	SF-Cu		2.0090	8,9	1
	SE-Cu		2.0070	8,9	1
Copper-zinc alloys (brass and special brass)	CuZn5	Ms95	2.0220	8,9	1
	CuZn10	Ms90	2.0230	8,8	0,989
	CuZn15	Ms85	2.0240	8,8	0,989
	CuZn20	Ms80	2.0250	8,7	0,977
	CuZn28	Ms72	2.0261	8,6	0,966
	CuZn30	Ms70	2.0265	8,5	0,955
	CuZn33	Ms67	2.0280	8,5	0,955
	CuZn36	Ms63	2.0335	8,4	0,944
	CuZn37		2.0321	8,4	0,944
	CuZn40	Ms60	2.0360	8,4	0,944
	CuZn30Al	—	2.0515	7,5	0,843
	CuZn31Si	SoMs68	2.0490	8,4	0,944
	CuZn35Ni	SoMs59	2.0540	8,3	0,932
	CuZn40Ni	SoMs58	2.0571	8,3	0,932
	CuZn40Mn		2.0572	8,3	0,932
Copper-tin alloys (tin bronze)	CuSn6	SnBz6	2.1020	8,8	0,989
	CuSn8	SnBz8	2.1030	8,8	0,989
Copper-nickel alloys	CuNi10Fe		2.0372	8,9	1
	CuNi30Fe		2.0382	8,9	1

Table 3. (Continued)

Denomination	Symbol	Material number	Density kg/dm³	Conversion factor
Wrought copper alloys, low alloyed	CuASP	2.1491	8,9	1
	CuCd0,5	2.1265	8,9	1
	CuCd1	2.1266	8,9	1
	CuMn2	2.1363	8,8	0,989
	CuMn5	2.1366	8,6	0,966
	CuSi2Mn	2.1522	8,7	0,977
	CuSi3Mn	2.1525	8,5	0,955
	CuBe1,7	2.1245	8,4	0,944
	CuBe2	2.1247	8,3	0,932
	CuCoBe	2.1285	8,8	0,989
	CuCr	2.1291	8,9	1
	CuNi1,5Si	2.0853	8,8	0,989
	CuNi2Si	2.0855	8,8	0,989
	CuNi3Si	2.0857	8,8	0,989

Table 4. Materials group III

Denomination	Symbol new	Symbol previously	Material number	Density kg/dm³	Conversion factor
Copper-zinc alloys (special brass)	CuZn37Al	SoMs58Al1	2.0510	8,3	0,932
	CuZn40Al1		2.0561	8,2	0,921
	CuZn40Al2	SoMs58Al2	2.0550	8,1	0,910
	CuZn40MnPb	SoMs58Pb	2.0580	8,2	0,921
Copper-nickel-zinc alloys (nickel silver)	CuNi10Zn42Pb	Ns4711Pb	2.0770	8,5	0,955
	CuNi12Zn24	Ns6512	2.0730	8,7	0,977
	CuNi12Zn30Pb	Ns5712Pb	2.0780	8,6	0,966
	CuNi18Zn20	Ns6218	2.0740	8,7	0,977
	CuNi18Zn19Pb	Ns6218Pb	2.0790	8,8	0,989
Copper-aluminium alloys (aluminium bronze)	CuAl5	AlBz5	2.0916	8,2	0,921
	CuAl8	AlBz8	2.0920	7,7	0,865
	CuAl8Fe	AlBz8Fe	2.0932	7,7	0,865
	CuAl10Fe	AlBz10Fe	2.0936	7,5	0,843
	CuAl9Mn	AlBz9Mn	2.0960	7,5	0,843
	CuAl10Ni	AlBz10Ni	2.0966	7,5	0,843
	CuAl11Ni	AlBz11Ni	2.0978	7,4	0,831

5) In view of the splitting up of what was previously Ms 58, this issue of the Standard includes, as an exception, the following note regarding use of the different alloys (see DIN 17660):

CuZn39Pb2: Readily machinable alloy with low cold forming capability by bending, riveting and flanging.
CuZn39Pb3: Principal alloys for machining on automatics, only a small amount of cold forming possible.
CuZn40Pb2: Alloy for all machining methods.
CuZn40Pb3: Principal alloys for machining on automatics, exceptionally free-flowing chips.

4. Materials and strength properties

(to be stated when ordering)

Copper and wrought copper alloys according to DIN 17672 Sheet 1 and DIN 40500 Sheet 3 (copper for electrical engineering), the dimension ranges indicated therein being taken into account.

Materials groups I, II and III take account of the differences in forming capability of the alloys according to their composition (cf. symbols in Tables 2 to 4 on page 3).

5. Finish

According to technical conditions of delivery DIN 17672 Sheet 2, for copper for electrical engineering according to DIN 40500 Sheet 3.

6. Weights and permissible weight variations

The weight in kg/m is calculated at the nominal dimension of the particular diameter and at the density of the material. For conversion factors, see Tables 2 to 4.

The permissible weight variation results from the permissible variations in the nominal dimensions and the permissible variations in composition.

7. Mode of delivery

7.1. Rods in manufacturing lengths

5 % of the rods in a delivery may consist of short lengths of not less than 1000 mm.

7.2. Rods in approximate lengths

Approximate lengths are to be specially agreed when ordering. For identification purposes, the word "approximate" shall be appended to the length data in such cases.

The permissible variation of the lengths ordered is ± 10 %.

Short lengths of not less than 1000 mm are permitted up to 10 % of the weight supplied.

7.3. Rods in fixed lengths

Fixed lengths are to be specially agreed when ordering. For identification purposes, the word "fixed" shall be appended to the length data in such cases. For fixed lengths the permissible variations according to Table 6 apply.
In the case of fixed lengths, sawcuts may vary from a right angle by only half the permissible variation shown in Table 6.

Table 5. Manufacturing lengths

Diameter *d* Dimension ranges	Manufacturing lengths	
from 0,5 to 1,8	maximum	2000
over 1,8 to 25	maximum	3000
over 25 to 50	minimum	2000
over 50 to 80	minimum	1000

Table 6. Permissible variations for fixed lengths

Diameter *d* Dimension ranges	Permissible variations for fixed lengths over — up to 100	100 up to 250	250 up to 500	500 up to 1000	1000 up to 2000	2000 up to —
from 0,5 to 10	+1	+1,5	+2	+3	+4	+5
over 10 to 18	+1	+1,5	+2	+3	+4	+5
over 18 to 30	+1,5	+2	+3	+4	+5	+6
over 30 to 50	+2	+3	+4	+5	+6	+7
over 50 to 80	+3	+4	+5	+6	+7	+8

7.4. Example of order

2 t drawn round rod of diameter d = 22 mm in the material having the symbol CuZn37 F30 (previously Ms63 F30) or material number 2.0321.10 in manufacturing lengths:

2 t Round 22 DIN 1756 - CuZn37 F30

or 2 t Round 22 DIN 1756 - 2.0321.10

previously 2 t Round 22 DIN 1756 - Ms63 F30

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