
INTERNATIONAL STANDARD



274

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Copper tubes of circular section — Dimensions

Tubes en cuivre de section circulaire — Dimensions

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FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 274 was drawn up by Technical Committee ISO/TC 5, *Metal pipes and fittings*, and circulated to the Member Bodies in April 1974.

It has been approved by the Member Bodies of the following countries :

Austria	Germany	Spain
Belgium	Hungary	Switzerland
Bulgaria	India	Thailand
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The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Ireland
Japan
Sweden
U.S.A.

This International Standard cancels and replaces ISO Recommendation R 274-1962, of which it constitutes a technical revision.

Copper tubes of circular section – Dimensions

1 SCOPE AND FIELD OF APPLICATION

This International Standard establishes a range of dimensions applicable to all copper tubes of circular section whatever their method of manufacture and their condition of delivery.

2 DEFINITIONS

2.1 outside diameter, D , of a tube : The arithmetic mean of any two mutually perpendicular outside diameters in the same right section.

2.2 thickness, a , of a tube : The arithmetic mean of two thicknesses traversed by the same diameter.

3 DIMENSIONS

3.1 General purpose tubes

Outside diameter and thickness are given in table 1.

TABLE 1

Dimensions in millimetres

Outside diameter <i>D</i>		Thickness, <i>a</i>													
		0,5	0,6	0,8	1	1,2	1,5	2	2,5	3	3,5	4	4,5	5	
2	± 0,08	*													
2,5			*												
3		*	*	*											
4		*	*	*	*										
5		*	*	*	*	*									
6		*	*	*	*	*									
8		*	*	*	*	*	*								
10	± 0,10	*	*	*	*	*	*								
12		*	*	*	*	*	*	*							
14		*		*	*	*	*	*							
15		*		*	*	*	*	*	*						
16		*	*	*	*	*	*	*							
18	± 0,12			*	*	*	*	*							
20				*	*	*	*	*	*						
22					*	*	*	*	*	*					
25					*	*	*	*	*	*	*				
28					*	*	*	*	*	*	*				
30					*	*	*	*	*	*	*				
32	± 0,15					*	*	*	*	*					
35						*	*	*	*	*	*				
38						*	*	*	*	*	*				
40						*	*	*	*	*	*				
42						*	*	*	*	*	*				
44,5	± 0,20					*	*	*	*	*	*				
50						*	*	*	*	*	*				
57						*	*	*	*	*	*				
76,1	± 0,25						*	*	*	*	*	*			
88,9							*	*	*	*	*	*	*	*	
108	± 0,50						*	*	*	*	*	*	*	*	
133							*	*	*	*	*	*	*	*	
159							*	*	*	*	*	*	*	*	
193,7	± 0,80						*	*	*	*	*	*	*	*	
219,1							*	*	*	*	*	*	*	*	
244,5	± 1,00						*	*	*	*	*	*	*	*	
267							*	*	*	*	*	*	*	*	
273							*	*	*	*	*	*	*	*	
323,9	± 1,25						*	*	*	*	*	*	*	*	
368							*	*	*	*	*	*	*	*	
419							*	*	*	*	*	*	*	*	
457,2	± 1,50						*	*	*	*	*	*	*	*	
508							*	*	*	*	*	*	*	*	

Preferred dimensions are marked with an asterisk (*).
If other dimensions are used, they shall be selected from the area limited by the stepped lines.

3.2 Tubes for capillary soldering

Outside diameter and thickness are given in table 2.

TABLE 2

Dimensions in millimetres

Outside diameter <i>D</i>		Thickness, <i>a</i>			
		Series 1	Series 2	Series 3	Series 4
6	± 0,045	0,5	0,6	0,8	1
8		0,5	0,6	0,8	1
10		0,5	0,6	0,8	1
12		0,5	0,6	0,8	1
15		0,5	0,7 or 0,8	1	1,2
18	± 0,055	0,6	0,8	1	1,2
22		0,6	0,9 or 1	1,2	1,5
28		0,6	0,9 or 1	1,2	1,5
35	± 0,07	0,7	1 or 1,2	1,5	2
42		0,8	1 or 1,2	1,5	2
54		0,9	1,2	1,5	2

3.3 Length

The length shall be specified on the order, or shall be between 3 and 6 m.

4 TOLERANCES

The tolerances on outside diameter *D*, on thickness *a* and on coaxiality (see 4.1, 4.2 and 4.5) are applicable to cold-worked tubes and annealed tubes delivered in straight lengths or in coils.

The tolerances on specified lengths (see 4.3) are applicable both to annealed and to cold-worked tubes delivered in straight lengths; the tolerances on straightness (see 4.6) are only applicable to cold-worked tubes.

The tolerances on circularity (see 4.4) are only applicable to cold-worked tubes.

4.1 Tolerance on outside diameter, *D*

The tolerances of tubes delivered in coils are obtained by subsequent gauging.

See tables 1 and 2.

4.2 Tolerance on thickness, *a*

For $D \leq 108$ mm : ± 10 %.

For $D > 108$ mm : ± 12,5 %.

4.3 Tolerance on specified lengths

The tolerances are given in table 3.

Out-of-square tolerances are included in these tolerances.

4.4 Tolerance on circularity

The circularity deviation is the difference between the maximum and minimum outside diameters measured in the same right section.

For $\frac{a}{D} < 0,03$, this deviation shall not exceed 0,01 *D*.

For $\frac{a}{D} \geq 0,03$, this deviation shall not exceed, in the case of general purpose tubes :

- for $D \leq 80$: 1,5 (2,0) times the tolerance on *D*;
- for $D > 80$: twice the tolerance on *D*.

The value in parentheses is for tubes for capillary soldering.

4.5 Tolerance on coaxiality (eccentricity)

The coaxiality deviation is half the difference between the maximum and minimum thicknesses measured over the same diameter. This deviation shall be included in the thickness tolerances.

4.6 Tolerance on straightness

The deflection shall not exceed 2 mm per metre.

TABLE 3

Values in millimetres

Outside diameter <i>D</i>	Tolerances			
	Specified lengths :			
	$L \leq 1\ 000$	$1\ 000 < L \leq 2\ 000$	$2\ 000 < L \leq 3\ 000$	$L > 3\ 000$
2 to 80	+2 0	+3 0	+4 0	By agreement between the manufacturer and the user
80 to 300	+4 0	+5 0	+6 0	
300 to 508	+6 0	+7 0	+8 0	

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