



# EN STANDARDS FOR COPPER TUBE AND FITTINGS

**EN** standards have been written to harmonise copper tube and fitting standards throughout the 18 member nations of the European Committee for Standardisation.

## Tube standard

EN 1057 Copper and copper alloys - Seamless round copper tubes for water and gas in sanitary and heating applications, is one of a series of European Standards for copper and copper alloy tubes that are in the course of adoption. It specifies the requirements for copper tubes from 6mm up to 267mm diameter for:

- distribution pipework for hot and cold water;
- hot water heating systems, including under-floor heating systems;
- domestic gas and liquid fuel distribution;
- waste water sanitation.

The tube standard gives details of nominal cross-sectional dimensions in millimetres (nominal outside diameter x nominal wall thickness) and material temper. It also gives product designation details and sets out tests that are carried out by the manufacturer to ensure that the tube supplied is free from defects and meets the requirements of the standard.

With 46 recommended combinations of diameter and wall thickness, available from the 26 different diameters and 12 different wall thicknesses, together with a further (non-recommended) 57 other combinations, and 12 other combinations included for a limited period, ordering copper tube might not be quite the simple task it is today!

The main combinations of diameter and wall thickness are set out in Table 1. In the table, 'R' indicates a European recommended dimension, 'X' indicates

**Table 1 EN 1057 Outside diameters and wall thicknesses (mm)**

Tube size	Nominal Wall thickness											
	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.5	2.0	2.5	3.0
6	X	R		R		R						
8	X	R		R		R						
10	X	R	R	R		R						
12	X	R	X	R		R						
14			X	X		X						
15	X		R	R		R		X	X			
16				X		X		X				
18		X		R		R		X	X			
22		X		X	X	R	X	R	R			
25						X		X	X			
28		X		X	R	R		R	R			
35			X	X		X	X	R	R	X		
40						X	X					
42				X		X		R	R	X		
54				X	X	X		R	R	R		
64									X	R	X	
66.7						X		R	X	X	X	
70										X	X	
76.1								X	R	R	X	
80						X				X		
88.9										R	X	X
108								X	R	X	R	X
133									R	X		R
159									X	R		R
219												R
267												R

R = European recommended dimensions X = indicates other European dimensions

Material temper		Nominal outside diameter d, mm		Tensile strength R <sub>m</sub> , MPa	Hardness indicative
Designation in accordance with EN 1173	Common term	min.	max.	min.	HV5
R220	annealed	6	54	220	(40 to 70)
R250	half hard	6	66.7	250	(75 to 100)
R250	half hard	6	159	250	(75 to 100)

NOTE 1: Hardness figures are given for guidance only.

NOTE 2: Minimum elongation values range from 40% to 20% for annealed and half hard tempers.

Form of delivery	Tube dia. (mm) from   up to & inc.		Length (m)	Material temper
Coils	6	28	10-50	R220
Straight lengths	6	267	3-6	R250
	6	267	3-6	R290

other European dimensions, whilst the shaded boxes indicate our current BS 2871: Part 1 tube sizes. The 'R' marked dimensions have been chosen as a first step towards a rationalised standard with not more than three wall thicknesses for each diameter together with a restricted number of diameters. Table 2 sets out the mechanical properties of the tube in its three states of temper whilst Table 3 gives details of the recommended form of delivery, in terms of straight lengths and coils.

### Ordering the product

When requesting prices or ordering tube it will be important to correctly state a number of items of information to be certain of receiving correct information and then delivery of the particular tube required. The standard sets out the following items of information that should be supplied:

- quantity of material required, (in metres);
- denomination of the product, (copper tube);
- number of the European standard, (EN 1057);
- temper designation, (see Table 2);
- nominal cross-sectional dimensions: outside diameter x wall thickness, (see Table 1);
- form of delivery, (see Table 3).

An example:

Ordering details for 150m of copper tube conforming to the standard, in temper R250 (half-hard), outside diameter 15mm, wall thickness 0.7mm, in 3m straight lengths. (In other words our tried and trusted 15mm Table X tube.) This should be identified as follows: 150m copper tube EN 1057 - R250 - 15 x 0.7 - 3m straight lengths.

Quite a mouthful, I think you'll agree! But, necessary if you are to be certain of receiving the particular type of copper tube you require.

### Fittings standard

The EN 1254 standard has five separate parts for the specifications of the fitting ends:

- EN 1254-1 covers capillary ends for copper tube;
- EN 1254-2 covers compression ends for copper tube;
- EN 1254-3 covers compression for plastic tube;
- EN 1254-4 covers male and female threaded ends;
- EN 1254-5 covers short cup ends (for brazing only).

### Ordering fittings

The main change that we, as installers, are likely to notice is in the method of designating the particular fitting we require. To be certain the following information should be quoted:

- either the manufacturers catalogue number or common name (elbow, tee, coupling);
- the number and part of the standard, (for example EN 1254-1 would specify a capillary fitting);
- the size of the connecting ends (see below for sequence) or, in the case of fittings with threaded connections in accordance with EN 1254-4, or other threads, by the thread designation;
- if a 'slip' fitting is required this will have to be stated;
- if dezincification resistance is required this will have to be stated;
- if required, the type of plating will have to be stated.

### Sequence for specifying ends

In the UK we have ordered tees (and crosses) using the following sequence: run-run-branch(-branch). This will be the non-preferred method. The preferred method will be to order using the sequence: run-branch-run(-branch). This could cause confusion. If the order does not make it clear that the non-preferred sequence was used the supplier will assume that the run-branch-run sequence is required, (see Figure 1).

### Confused!

There is no need to be confused or in any way intimidated by the new terminology. Some of us still remember metrication in 1971 with the change from inches to, the then alien, millimetres. However, usage becomes second nature and expressions such as "15mm Table X" are now familiar to all of us.

As one would expect, copper tube and fittings manufacturers are fully conversant with the European standards and, if you have any doubts regarding the new terminology, cross reference can be made to the former standard and the manufacturer will do the rest. For example that old favourite 15mm Table X could be ordered by requesting 15mm tubing to EN 1057 aligning with the former Table X.

It will be just as easy to order fittings by quoting EN 1254 in conjunction with the manufacturers catalogue number or common name (e.g. elbow, tee, etc.).

