

TECHNICAL RANGE

# The Complete Pipe Fitting's Handbook



**DZR**  
DEZINCIFICATION  
RESISTANT BRASS

**SABS**  
APPROVED

**SABS**  
ISO 9001



**COBRA**  
A SOUTH AFRICAN ICON

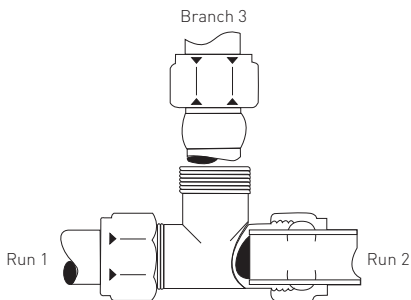
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### Special Note

Throughout this booklet sizes for unequal ends of tees have been given in the number order as indicated above. When ordering, use the same system, the branch size always being stated last.

All imperial sizes quoted refer to ends for BSP thread connections. All metric sizes quoted refer to nominal sizes for copper tubes to SABS.

In the compression range both male and female connecting threads are BSP parallel.

In the capillary range all male connecting threads are BSP Taper. All female connecting threads are BSP parallel.

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## INTRODUCTION

### Compression Fittings

The compression ring type copper tube joining system was designed and introduced in the United Kingdom in 1933. Cobra introduced it to the South African market in the early 1950's, under the "Conex" brand at the time and in recent years under the COBRA brand.

The versatility, efficiency and jointing speed led to its rapid adoption by plumbing contractors. The introduction of Hard Drawn Copper Tube has led to the wider use of copper tube systems in inland areas. Cobra compression is suitable for use with hard drawn (SANS 460 class O) tubing as well. Inland contractors have discovered that with Cobra compression fittings they can use cheaper, less skilled labour. It is a much faster system to install than the ones used traditionally and the range of fittings is comprehensive and all made locally. It has the added advantage that the pipework can be dismantled and re-assembled, should the need arise. Cobra compression fittings is ideally suited for use in emergency repairs as well, for instance with the slip couplings D-1XL-15 S/C and D-1XL-22 S/C which can be used to make a repair connection to rigid pipework mounted close to a wall.

The fact that the complete connection is a metal to metal mechanical coupling makes it both permanent (no organic sealing material that can deteriorate), as well as being suitable for applications where the heat and open flames of soldered connections can pose a hazard.

With the introduction of SABS Specification 1067-2 in 1985 which required the use of DEZINCIFICATION RESISTANT BRASS, Cobra took steps to ensure that Cobra compression fittings complied with this specification.

Cobra compression fittings can be used in conjunction with Cobra Safe Single Layer Polyethylene Pipe System as well as Cobra Safe Multi Layer Polyethylene Pipe System.

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## COPPER TUBING FOR ECONOMY

DZR Brass: All Cobra compression fittings are manufactured from Dezincification Resistant Brass as required by SANS 1067 Part 1 and 2 Specification.

### Using Copper Tube Saves You Money In Many Ways:

- It is faster (over 50% in time can be saved)
- No thread cutting and extra costly labour – giving increased output
- Prefabrication – on large repetitive installations the system lends itself admirably to prefabrication – this is especially so when used in conjunction with Copcal capillary solder fittings
- No heavy equipment to transport

### Advantages of Copper Tubing Systems:

- Excellent corrosion resistance, both internal and external
- Low in service maintenance (no furring)
- Superior flow characteristics – even after many years
- Space saving
- Neat appearance where exposed
- Shallower chasing in walls
- Cost effective in terms of overall installed cost
- No heavy equipment required
- Light weight – facilitating transport, fabrication and installation

### Copper Builds Confidence!

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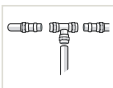
## MAKING A COMPRESSION JOINT



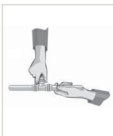
1. Copper Tube can be cut with a hacksaw: a fine toothed blade is best, or use a roller tube cutter; Do not use too much pressure on the cutting disk.



2. Clean the ends of the tube with a file or de-burring tool, inside and outside.



3. The parts of the joint can be laid out like this before assembly.



4. Slide the copper tube into the Cobra compression fitting until it stops against the fitting's inner shoulder. Tighten the cap nut by hand, ensuring that the tube stays firmly against the fitting's inner shoulder.



5. Following hand tightening of the cap nut, tighten with a spanner until the copper tube is difficult to rotate in the compression fitting, thereafter tighten the cap nut through half a turn. Inspect and pressure test the joint pipe.

This compression joint is designed to be a metal to metal mechanical coupling (also applicable to Cobra SLP & MLP systems, no de-burring necessary); there is therefore no need for any additional sealant material or compounds.

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## COMPRESSION FITTINGS

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### D-1XS

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Straight Coupler.  
Copper to Copper connections.



15mm; 22mm;  
28mm; 35mm;  
42mm; 54mm

\* Also available D-1XL-12 S/C,  
D-1XL-15 S/C, D-1XL-18 S/C  
and D-1XL-22 S/C Slip Couplings  
(without internal pipe stops) for  
repairs or alterations to rigid pipework.

### D-2XS

---

Straight Coupler.  
Copper to Male Iron connections.



15mm x 1/2"; 22mm x 3/4";  
28mm x 1"; 35mm x 1 1/4";  
42mm x 1 1/2"; 54mm x 2"

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## COMPRESSION FITTINGS

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### D-3XS

---

Straight Coupler.  
Copper to Female Iron connections.

15mm x 1/2"; 22mm x 3/4";  
28mm x 1"; 35mm x 1 1/4";  
42mm x 1 1/2"; 54mm x 2"



### D-1RXS

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Reducing Straight Coupler.  
Copper x Copper connections.

22mm x 15mm;  
28mm x 22mm





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## COMPRESSION FITTINGS

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### D-4XS

---

Elbow, 90°.  
Copper to Copper connections.

15mm; 22mm;  
28mm; 35mm;  
42mm; 54mm



### D-4RXS

---

Reducing Elbow, 90°.  
Copper to Copper connections.

22mm x 15mm



---

## COMPRESSION FITTINGS

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### D-2RXS

---

Reducing Straight Coupler  
Copper to Male Iron connections.

15mm x  $\frac{3}{4}$ ";  
22mm x 1"



### D-3RXS

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Reducing Straight Coupler  
Copper to Female Iron connections.

15mm x  $\frac{3}{4}$ "



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## COMPRESSION FITTINGS

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### D-8XS

---

Elbow, 90°.

Copper to Male Iron connections.

15mm x 1/2"; 22mm x 3/4";  
28mm x 1"; 35mm x 1 1/4";  
42mm x 1 1/2"; 54mm x 2"



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### D-10XS

---

Elbow, 90°.

Copper to Female Iron connections.

15mm x 1/2"; 22mm x 3/4";  
28mm x 1"; 35mm x 1 1/4";  
42mm x 1 1/2"; 54mm x 2"



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## COMPRESSION FITTINGS

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### D-33XS

---

Wallplate Elbow, 90°.  
Copper to Female Iron connections.

15mm x 1/2"; 22mm x 3/4"



### D-37XS

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Swivel Elbow, 90°.  
Copper to Female Iron connections.

15mm x 1/2"



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## COMPRESSION FITTINGS

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### D-10RXS

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Reducing Elbow, 90°.  
Copper to Female Iron connections.

15mm x 3/4"



### D-12XS

---

Equal Tee.  
Copper to Copper connections.

15mm; 22mm;  
28mm; 35mm;  
42mm; 54mm



---

## COMPRESSION FITTINGS

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### D-15XS

---

Tee.

Copper to Copper to Male Iron connections.

15mm x 15mm x 1/2";  
22mm x 22mm x 3/4"



### D-17XS

---

Tee.

Copper to Copper to Female Iron connections.

15mm x 15mm x 1/2";  
22mm x 22mm x 3/4"



---

## COMPRESSION FITTINGS

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### D-29XS

---

Wallplate Tee.  
Copper to Copper to Female Iron connections.

15mm x 15mm x 1/2"



### D-17RXS

---

Reducing Tee.  
Copper to Copper to Female Iron connections.

22mm x 22mm x 1/2"



---

## COMPRESSION FITTINGS

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### D-279XS

---

Reducing Tee.  
All ends Copper. Run equally reduced.

15mm x 15mm x 22mm;  
22mm x 22mm x 28mm



### D-280XS

---

Reducing Tee.  
All ends Copper. Run and Branch equally reduced.

22mm x 15mm x 15mm





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## COMPRESSION FITTINGS

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### D-79XS

---

Reducing Tee.  
All ends Copper. One end on Run reduced.

22mm x 15mm x 22mm



### D-80XS

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Reducing Tee.  
All ends Copper. Branch reduced.

22mm x 22mm x 15mm;  
28mm x 28mm x 22mm



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## COMPRESSION FITTINGS

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### D-68XS

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Single Step Reducer (for adapting a fitting)

22mm x 15mm; 28mm x 22mm;  
35mm x 28mm; 42mm x 35mm;  
54mm x 42mm



### D-268XS

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Multi-Step Reducer

28mm x 15mm; 35mm x 22mm;  
42mm x 22mm; 42mm x 28mm;  
54mm x 22mm; 54mm x 28mm;  
54mm x 35 mm



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## COMPRESSION FITTINGS

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### 64XS

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Cap Nut

15mm; 22mm;  
28mm; 35mm;  
42mm; 54mm



### D-65XS

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Brass Compression Ring

15mm; 22mm;  
28mm; 35mm;  
42mm; 54mm



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## COMPRESSION FITTINGS

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**D-23XS**

Stop End

15mm; 22mm; 28mm



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**62XS**

Brass Holderbat for Copper Tube

15 mm; 22mm



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## GATE VALVES

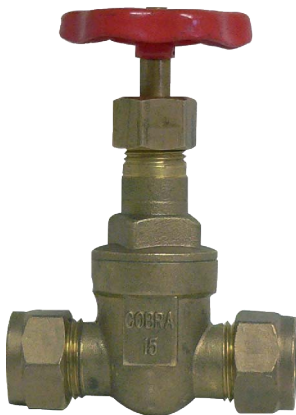
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**1003/125**

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Fullway Gate Valve.  
Copper to Copper with non-rising spindle and guided wedge.

15mm; 22mm;  
28 mm; 35mm;  
42mm; 54mm



**Use as an isolating valve ONLY**  
SABS 776-1976, Class 8

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## STOP TAP

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131

Stop Tap.  
Rough Brass. Copper to Copper

15mm; 22mm; SABS  
28 mm; BS 1010

SABS 226 Class 1 Heavy duty



\* Also available 231-15 Stop tap,  
Rough Brass, Copper to Copper;  
SABS 226 Class 2;  
SABS 226-1987, Type 1

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## **Capillary Fittings**

Cobra introduced Capillary (or Solder) fittings to the South African market in 1972. These fittings were, at that time, imported and did not have much impact on the traditional compression type copper tube market. However, with the introduction of Hard Drawn Copper tubing, this system has gained in popularity, particularly in those areas where galvanised piping has been used traditionally. Hard Drawn Copper tubing, when used with Cobra "Copcal" fittings, can compare in cost with any conventional system.

In 1984 Cobra began local manufacture of these fittings to SABS Specification 1067 Part 2, and today still manufacture the forged and cast DZR brass fittings.

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## CAPILLARY FITTINGS

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The comprehensive range of COBRA Capillary fittings conforms to SABS 1067 Part 2 1985 as well as to DIN 2856. ISO 2016 and BS 864 standard specifications.

The simple joining technique is a readily acquired skill and can be mastered with little difficulty. Users of Cobra Capillary fittings find this domestic plumbing much faster than any other.

The introduction of a Hard Drawn Copper tube, less expensive than the widely used domestic copper tube and conforming to SABS 460 Class "O", has made the choice of a copper tube installation a most economic proposition. The hard drawn tube when used with COBRA fittings, can compare in cost with any conventional system.

The savings in installation time, the competitive price of Hard Drawn Copper tube and Cobra Capillary fittings and the undeniable longevity of copper, all go to make the selection of this system sound economic sense.

### **NOTE:**

Fittings with a "D-" prefix are manufactured from Dezincification Resistant Brass.

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## MAKING A CAPILLARY JOINT



1. Copper Tube can be cut with a hacksaw: a fine toothed blade is best, or use a roller tube cutter; Do not use too much pressure on the cutting disk.



2. Clean the ends of the tube with a file or de-burring tool, inside and outside.



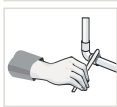
3. Apply flux to the outside of tube and inside cup of fitting so that the surfaces to be joined are completely covered. Use flux carefully and sparingly.



4. Bend over end of solder wire - about the length of the size of the fitting. 15mm solder for 15mm fittings, etc. Over 50mm diameter approximately three times the diameter of the fitting is required.



5. Apply flame to the fitting to heat the tube and the cop of the fitting until solder melts when placed at the joint, and then pass the flame towards the centre of the fitting until solder is absorbed and joint completed.



6. Remove excess solder with small brush (or a damp cloth) while the plastic is leaving a fillet around end of fitting while it cools.

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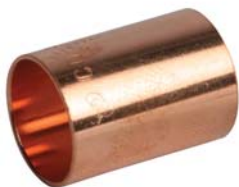
## CAPILLARY FITTINGS

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### 600M

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Straight Slip Coupler  
Copper to Copper connections.



15mm, 22mm,  
28mm, 35mm,  
42mm, 54mm,  
67mm, 76mm,  
108mm.

### 601M

---

Straight Coupler  
Copper to Copper connections.



15mm, 22mm,  
28mm, 35mm,  
42mm, 54mm,  
67mm, 76mm,  
108mm.

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## CAPILLARY FITTINGS

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### 601M

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Reducing Straight Coupler  
Copper to Copper connections.

22mm x 15mm, 28mm x 15mm,  
28mm x 22mm, 35mm x 28mm,  
42mm x 35mm, 54mm x 42mm,  
76mm x 35mm, 76mm x 42mm,  
76mm x 54mm.



### 601M-TC

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Straight Tap Connector.  
Copper to Female Iron connections.

15mm x 1/2"; 22 x 3/4"



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## CAPILLARY FITTINGS

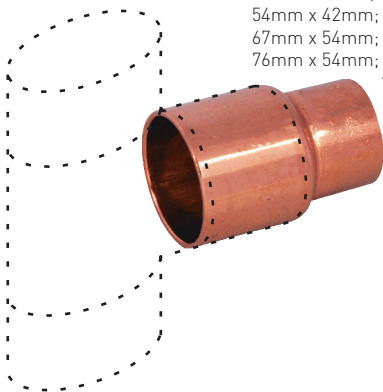
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**601-2M**

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Reducing Straight Coupler.  
Copper to Copper connections.  
[To reduce a fitting]

22mm x 15mm; 28mm x 15mm;  
28mm x 22mm; 35mm x 15mm;  
35mm x 22mm; 35mm x 28mm;  
42mm x 15mm; 42mm x 22mm  
42mm x 28mm; 42mm x 35mm;  
54mm x 15mm; 54mm x 22mm;  
54mm x 28mm; 54mm x 35mm;  
54mm x 42mm; 67mm x 35mm;  
67mm x 54mm; 76mm x 35mm;  
76mm x 54mm; 76mm x 67mm;  
108mm x 76mm



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## CAPILLARY FITTINGS

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### D603M

---

Straight Coupler.  
Copper to Female Iron connections.

15mm x 1/2"; 22mm x 3/4";  
28mm x 1"; 35mm x 1 1/4";  
42mm x 1 1/2"; 54mm x 2";  
76mm x 3"



### D603M

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Reducing Straight Coupler.  
Copper to Female Iron connections.

15mm x 3/4"



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## CAPILLARY FITTINGS

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### 604M

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Reducing Straight Coupler.  
Copper to Male Iron connections.

15mm x 3/4"



### D604M

---

Straight Coupler.  
Copper to Male Iron connections.

15mm x 1/2", 22mm x 3/4",  
28mm x 1", 35mm x 1 1/4",  
42mm x 1 1/2", 54mm x 2",  
76mm x 3".



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## CAPILLARY FITTINGS

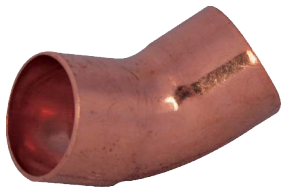
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### D606M

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Elbow 45°.  
Copper to Copper connections.

15mm; 22mm;  
28mm; 35mm;  
42mm; 54mm;  
76mm; 108mm

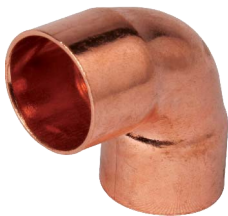


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### 607M

Elbow 90°.  
Copper to Copper connections.

15mm; 22mm;  
28mm; 35mm;  
42mm; 54mm;  
67mm; 76mm;  
108mm



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## CAPILLARY FITTINGS

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**607M**

Reducing Elbow 90°.  
Copper to Copper connections.

22mm x 15mm



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**607M-TC**

Bent Tap Connector  
Copper to Female Iron connections

15mm x 1/2" ; 22mm X 3/4"





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## CAPILLARY FITTINGS

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### D707-3M

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Reducing Elbow 90°.  
Copper to Female Iron connections.

15mm x 3/4"



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### D707-3M

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Elbow 90°.  
Copper to Female Iron connections.

15mm x 1/2"; 22mm x 3/4";  
28mm x 1"; 35mm x 1 1/4";  
42mm x 1 1/2"; 54mm x 2"



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## CAPILLARY FITTINGS

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### D707-3-5M

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Wallplate Elbow 90°.  
Copper to Female Iron connections.

15mm x 1/2" ; 22mm x 3/4"



### D707-4M

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Elbow 90°.  
Copper to Male Iron connections.

15mm x 1/2"; 22mm x 3/4";  
28mm x 1"; 35mm x 1 1/4";  
42mm x 1 1/2"; 54mm x 2"



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## CAPILLARY FITTINGS

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### 611M

---

Reducing Tee.  
All ends Copper. Run equally reduced.

15mm x 15mm x 22mm



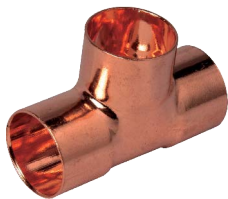
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### 611M

---

Equal Tee.  
All ends Copper.

15mm; 22mm;  
28mm; 35mm;  
42mm; 54mm;  
67mm; 76mm;  
108mm



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## CAPILLARY FITTINGS

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**611M**

---

Reducing Tee.

All ends Copper. Branch reduced.

22mm x 22mm x 15mm; 28mm x 28mm x 15mm;  
28mm x 28mm x 22mm; 35mm x 35mm x 15mm;  
35mm x 35mm x 22mm; 35mm x 35mm x 28mm;  
42mm x 42mm x 15mm; 42mm x 42mm x 22mm;  
42mm x 42mm x 28mm; 42mm x 42mm x 35mm;  
54mm x 54mm x 22mm; 54mm x 54mm x 28mm;  
54mm x 54mm x 35mm; 54mm x 54mm x 42mm;  
67mm x 67mm x 54mm; 76mm x 76mm x 35mm;  
76mm x 76mm x 42mm; 76mm x 76mm x 54mm;  
108mm x 108mm x 54mm; 108mm x 108mm x 76mm



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## CAPILLARY FITTINGS

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### 611M

---

Reducing Tee.  
All ends Copper. One end on Run reduced.

22mm x 15mm x 22mm;  
28mm x 22mm x 28mm



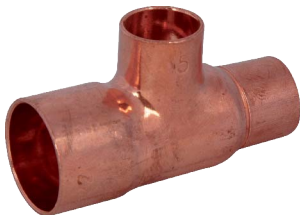
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### 611M

---

Reducing Tee.  
All ends Copper. Run and Branch equally reduced.

22mm x 15mm x 15mm;  
28mm x 22mm x 22mm



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## CAPILLARY FITTINGS

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### D712M

---

Reducing Tee.  
Copper to Copper to Female Iron connections.

15mm x 15mm x 1/2";  
22mm x 22mm x 3/4"

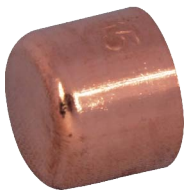


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### D617M

Tube End Cap

15mm; 22mm;  
28mm; 35mm;  
42mm; 54mm



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## CAPILLARY FITTINGS

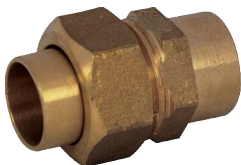
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### D733M

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Union Coupler.  
Copper to Copper connections.

15mm; 22mm



### 733-3M

---

Union Coupler.  
Copper to Female Iron connections.

15mm x 1/2"



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## CAPILLARY FITTINGS

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### D733-4M

---

Union Coupler.  
Copper to Male Iron connections.

15mm x 1/2"; 22mm x 3/4"



### 636M

---

Full Crossover.  
Copper to Copper connections.

15mm; 22mm





## COPPER TUBING FOR DOMESTIC PLUMBING

Tubes for Domestic Plumbing Services as per SABS 460

### Class 2 (Medium)

Nominal Size of Tube (mm)	Outside Diameter		Wall Thickness Class 2 Med. (mm)	Theoretical Mass kg/m Class 2	Maximum Working Pressure Mpa Class 2 Half Hard
	Max (mm)	Min (mm)			
15	15,045	14,955	1,0	0,392	7,54
22	22,055	21,945	1,0	0,588	5,00
28	28,055	27,945	1,2	0,900	4,72
35	35,070	34,930	1,5	1,407	4,72
42	42,070	41,930	1,5	1,701	3,81
54	54,070	53,930	2,0	2,912	4,06
76	76,170	76,030	2,0	4,150	2,85
108	108,070	107,930	2,5	7,385	2,50

### Class 1 (Light)

Nominal Size of Tube (mm)	Outside Diameter		Wall Thickness Class 1 Med. (mm)	Theoretical Mass kg/m Class 1	Maximum Working Pressure Mpa Class 1 Half Hard
	Max (mm)	Min (mm)			
15	15,045	14,955	0,70	0,280	5,16
22	22,055	21,945	0,90	0,532	4,50
28	28,055	27,945	0,90	0,683	3,50
35	35,070	34,930	1,20	1,136	3,74
42	42,070	41,930	1,20	1,371	3,03
54	54,070	53,930	1,20	1,774	2,40
76	76,170	76,030	1,50	3,133	2,12
108	108,070	107,930	1,50	4,473	1,49

## COPPER TUBING FOR DOMESTIC PLUMBING

### Class 0

Nominal Size of Tube (mm)	Outside Diameter		Wall Thickness Class 0 Med. (mm)	Theoretical Mass kg/m Class 0	Maximum Working Pressure Mpa Class 0 Half Hard
	Max (mm)	Min (mm)			
15	15,045	14,955	0,60	0,242	4,93
22	22,055	21,945	0,75	0,447	4,18
28	28,055	27,945	0,80	0,610	3,59
35	35,070	34,930	1,20	1,137	4,20
42	42,070	41,930	1,20	1,372	3,48
54	54,070	53,930	1,20	1,775	2,69
76	76,170	76,030	1,50	3,133	2,38
108	108,070	107,930	1,50	4,473	1,67





**SABS**  
ISO 9001



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