JOINTING COPPER TUBES

COMPRESSION JOINTS

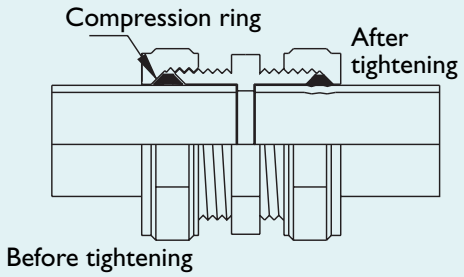

Figure 1 Type 'A' non-manipulative compression joint

Compression joints are made mechanically by compressing a sealing, or compression ring, on to the tube. Unlike capillary joints they do not require the application of heat.

Types of joint

There are two basic types of compression joints for use on copper tube to EN 1057. Type 'A' or non-manipulative soft joints, for general use above ground on half-hard condition. Type 'A' joints can also be used on stainless steel tube to BS 4127:2 The type 'B' or manipulative joint, are for use underground or above ground on soft coiled condition EN 1057 half hard thick wall tube formerly Table Y.

Jointing method for type 'A' non-manipulative compression joints

The jointing method for a type 'A' joint, illustrated in Figure 1, simply consists of selecting the correct sized fitting for the tube, cutting the tube to the correct length, removing any burrs and checking that the tube end is clean and free from deep scores or other imperfections. If the tube end is oval it should be re-rounded with a suitable tool. Now the tube can be fully inserted into the fitting until it makes contact with the tube stop. Next tighten in accordance with the manufacturers instructions. For example:- tighten the compression nut by hand and a spanner until the compression ring grips the tube, so that it cannot be rotated by hand in the fitting. Now further tighten the nut one third to two thirds of a turn using two spanners, this is to cause the compression ring to bite into and slightly deform the tube.

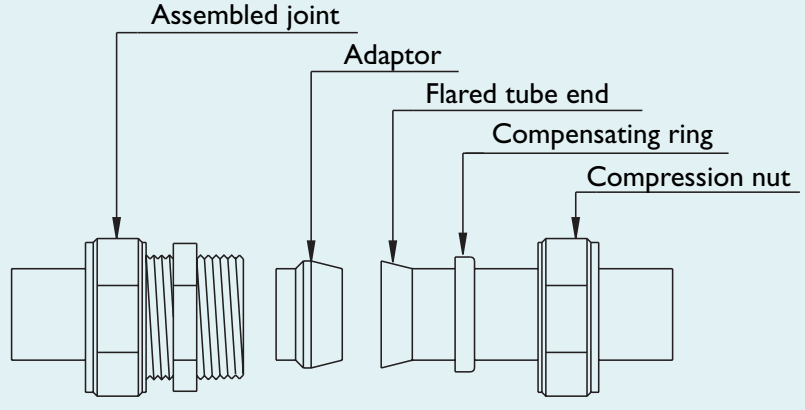

Figure 2 Type 'B' manipulative compression joint

Points to bear in mind when using compression joints

1. Don't allow the jointing surfaces and threads to become dirty or full of grit.
2. A little light oil on the threads of larger sized fittings will reduce the turning force (torque) required to make the joint.
3. Over-tightening the joint will not result in a stronger joint.
4. Beware of using a short wrench with wide opening jaws on large diameter fittings, it will not have sufficient leverage. A spanner at least 750mm long is needed to tighten a 54mm diameter joint.
5. Jointing compound is not normally necessary or recommended on compression ends, however a thin smear can be used on the jointing surfaces (not the threads) if a slight weep occurs.

Also, remember that an internal support or liner is recommended if using type 'A' non-manipulative compression joints on soft coiled copper tube of over 12mm OD. Similarly on polyethylene tube always use a liner of the correct type and diameter to support the tube wall when using a type 'A' compression joint.

Jointing method for type 'B' manipulative compression joints

The type 'B' joint, as shown in Figure 2, is designed to grip both the inner and outer surfaces of the tube, this results in a joint which can both support and tightly grip the soft condition tube for which it is designed. The jointing method consists of ensuring that the tube is of the correct specification and that the correct size of fitting is being used, next

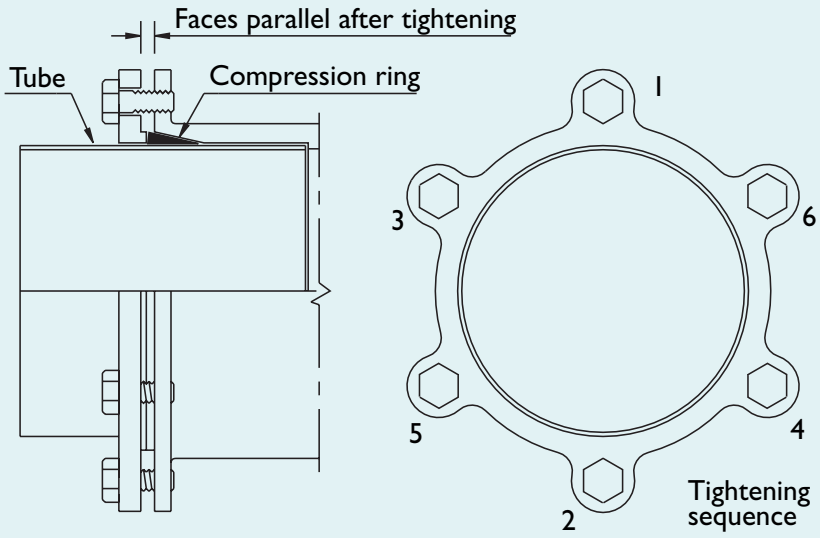

Figure 3 Large diameter compression joint

the tube is cut to length using a fine toothed hacksaw and the burrs moved inside and out. Slip the compression nut and compensating ring over the tube end and hammer the correct sized flaring tool or drift into the end of the tube to open out the end. Next check that the adaptor fits correctly into the end of the tube and the fitting body and tighten the compression nut first by hand and then with a spanner for about one full turn to produce a strong and leak-proof joint.

Use of compression joints on pipelines carrying Natural Gas

Copper tube up to 42mm OD can be used to carry Natural Gas. Compression fittings to EN 1254 can be used to joint the tube provided they are readily accessible and not buried in the structure of the building.

Large diameter compression joints

To obtain a secure joint on large diameter compression fittings without requiring excessively large spanners a slightly different method of tightening is used. A series of bolts and/or nuts are spaced around the joint to tighten it, as in Figure 3. To obtain a secure joint once the fitting is correctly positioned on to the tube, first tighten the bolts evenly by hand ensuring the flanges are parallel. Then further tighten them a minimum of two full turns in half turn stages working on diagonally opposite bolts in turn so that the backing flange and the face of the fitting body is kept parallel.

Occasional disconnection

Where tube is to be connected to appliances or components that require only occasional disconnection for maintenance or repair it makes sense to use a type 'A' compression joint. These can be easily de-mounted and reconnected occasionally without damage. Where regular disconnection for servicing is required it is better to use a proper ground-force union type joint as these enable frequent disconnection without damage or leakage.

Plastic push-fit joints

These joints also use the compression principle. The traditional compression joint uses a compression ring to both seal and mechanically fix the tube. In the push-fit joint these two tasks are performed by separate components. The water seal is made by a rubber sealing ring which is squeezed between the fitting body and the tube. A specially shaped toothed grab-ring allows the tube to be easily pushed into the fitting. Once inserted the water pressure, or other forces, are resisted by the teeth of the grab-ring. Take care if you decide to use this type of joint on copper tube. You could affect the integrity of the supplementary earth continuity bonding if you fit this type of joint because the plastic body will act as an electrical insulator between the two ends of the copper tube.

Choice of jointing system

When choosing from the various jointing systems available for use with copper tube the installer / specifier must consider many factors. Copper tube is durable, strong and resists damage and corrosion. The jointing method to be employed must also have these same properties if the customer is to have the benefit of a trouble-free, worry-free, healthy and safe installation. The installed cost of a copper installation is very competitive. If one adds in the intrinsic advantages of the metal - it's resistance to corrosion and high water pressures even in high temperature environments and it's freedom from long term degradation it's easy to see why a copper system adds up to peace of mind.

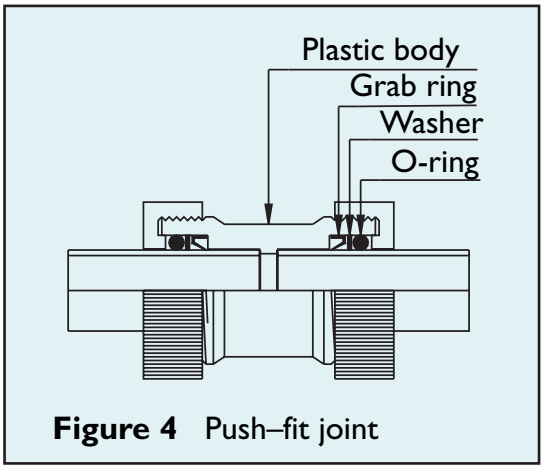

Figure 4 Push–fit joint