

How to Join Lawton Pre-Insulated Tube

Joining pre-insulated copper coil for refrigeration and air conditioning.



Lawton Pre-Insulated Tube	Refrigeration tube to BS EN 12735-1 with factory-applied foam insulation, supplied as PE (Class B) and NBR (Class O). The insulation is heat sensitive and must be drawn back and protected while the joint is made.
Jointing	Joints shall be brazed, not soldered. The work is carried out to BS EN 378 for refrigerating system safety.
Further Detail	Characteristics not covered here are given in the relevant datasheet. The standards and the project specification take precedence over this guide.

CAUTION: the joint shall be brazed under a continuous flow of dry, oxygen-free nitrogen. Air left in the tube forms internal oxide scale that breaks away and circulates, damaging the compressor and blocking expansion valves and capillaries. The tube must be kept clean and dry throughout, and open ends recapped between operations.

Filler and Flux	See the Lawton Jointing Solutions Data Sheet, including whether flux is needed for the joint. The filler shall suit the joint and the specification.
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Safety

- Brazing shall not be carried out on a system that contains refrigerant or is under pressure. The refrigerant must be recovered and the pressure relieved first; heating refrigerant produces toxic decomposition products.
- Work shall be carried out in a well ventilated area. Heating the insulation gives off fumes, which must not be breathed, and the insulation must not be burned or overheated. Oxygen-free nitrogen displaces air and can cause asphyxiation in confined or poorly ventilated spaces.
- Brazing goggles or a face shield and suitable gloves must be worn. Brazing produces fume, which must not be breathed; local extraction shall be used where practicable.
- Hot work precautions shall be observed. The insulation is combustible, so the flame must be kept off it and the work must not be left unattended. Combustible materials must be cleared from the area, a fire extinguisher kept to hand and a fire watch maintained after the work.

These are general precautions. Site rules and any permit to work may differ and shall be followed.

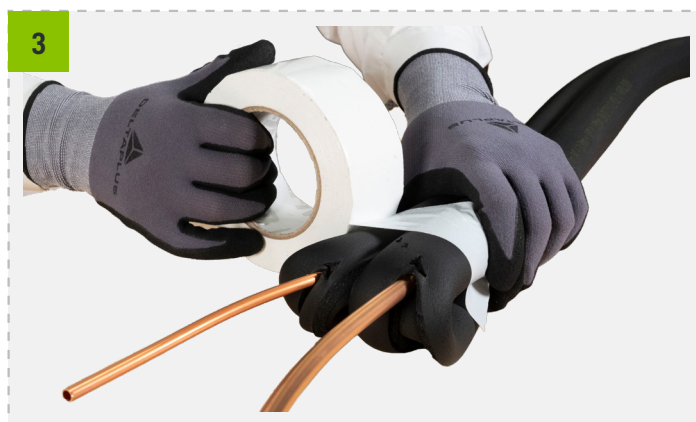
Procedure



1. Pay the coil off flat and cut to length. The tube must not be kinked, and must not be pulled from the centre of the coil.



2. Slide the insulation back along the tube, or cut and remove a section, to expose the tube well clear of the joint. Enough bare tube shall be left for the heat of brazing to dissipate.



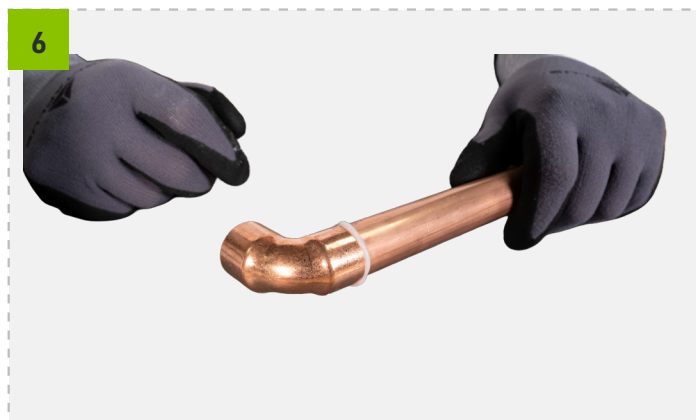
3. Secure the drawn-back insulation with tape so that it cannot creep back towards the joint.



4. Cut the tube square with a tube cutter. Remove the burr and keep swarf out of the bore.



5. Clean the outside end of the tube with sand cloth or sandpaper, to a length equal to the depth of the fitting, and clean the inside of the fitting to the tube stop. Wipe both surfaces clean.



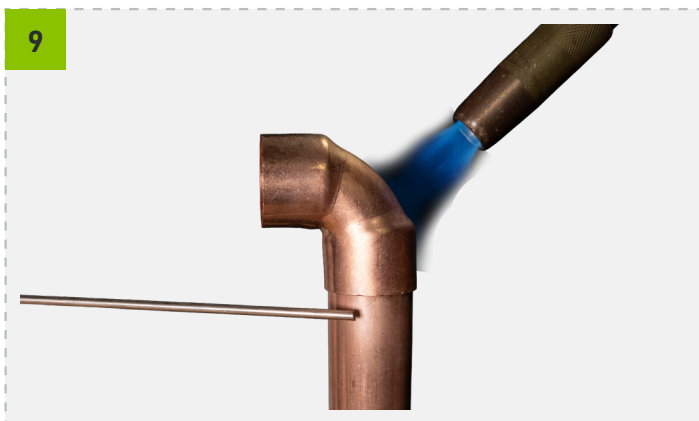
6. Assemble the tube fully into the fitting, up to the tube stop.



7. Start a continuous flow of dry, oxygen-free nitrogen through the assembly to displace air before any heat is applied. Keep the gas flowing throughout brazing and until the joint has cooled.



8. Wrap the insulation nearest the joint with a damp cloth to shield it from the heat.



9. Apply heat uniformly around the fitting with the torch. When the filler melts on contact with the heated fitting, the brazing temperature has been reached. Feed the filler slightly off centre at the bottom of the joint and work around the fitting until a complete ring of filler shows at the mouth. The flame must be kept off the insulation and no more heat used than the joint needs. Let the joint cool fully with the nitrogen still flowing. The joint must not be quenched.



11. Remove the damp cloth and retaining tape, and re-cover the joint. Slide the insulation back over it, or fit a new section, so that the joint is fully covered with no gap at the butt. Seal the seams and any exposed ends of the insulation with tape, so that the vapour barrier is continuous along the run.

After brazing

The insulation shall be continuous along the run, with every joint covered and sealed. A break in the vapour barrier lets moisture reach the cold tube surface, where it condenses and runs. On completion the system is strength and tightness tested, evacuated to remove moisture and non-condensable gases, and charged in accordance with BS EN 378 and the manufacturer's instructions.

For more details, please refer to our website or contact us by e-mail at technical@lawtontubes.co.uk