

- **Qual-PEX recommended operating parameters**

The following is a guideline as to what the operating parameters of Qual-PEX are;

|        |       |
|--------|-------|
| 12 Bar | 20 °C |
| 4 Bar  | 82 °C |
| 3 Bar  | 92 °C |

Short-term over load temperatures up to 114°C

- **Expansion and Contraction of Qual-PEX?**

Qual-PEX has a high co-efficient of expansion ( $1.5 \times 10^{-4}/^{\circ}\text{C}$  @ 20°C to  $2.8 \times 10^{-4}/^{\circ}\text{C}$  @ 82°C). You should allow for 1% expansion on the length when the pipe is installed at 20°C for use up to 82°C.

- **Clipping of Qual-PEX piping?**

Qual-PEX pipe should be clipped to support the pipe – especially around the jointing. Care should be taken however to cater for expansion and contraction due to fluctuations in the system. Below are recommended clipping distances:

|   | <u>20°C</u> | <u>60 °C</u> | <u>80 °C</u> |
|---|-------------|--------------|--------------|
| <b>10mm/12mm/15mm &amp; ½” Qual-PEX</b> |             |              |              |
| <i>Horizontal</i>                       | 500mm       | 400mm        | 300mm        |
| <i>Vertical</i>                         | 800mm       | 600mm        | 500mm        |
| <b>22mm &amp; ¾” Qual-PEX</b>           |             |              |              |
| <i>Horizontal</i>                       | 800mm       | 600mm        | 500mm        |
| <i>Vertical</i>                         | 1200mm      | 1000mm       | 800mm        |
| <b>28mm &amp; 1” Qual-PEX</b>           |             |              |              |
| <i>Horizontal</i>                       | 800mm       | 600mm        | 500mm        |
| <i>Vertical</i>                         | 1200mm      | 1000mm       | 800mm        |

Where Qual-PEX is boxed or installed under floors or in loft spaces, clipping distances can be increased, or the clips omitted altogether if the pipe is adequately supported by other means.

- **Can Qual-PEX pipe be bended?**

Yes. Slow 90° bends can be used angle brackets are utilised, otherwise standards joints (e.g. Elbow joints are used). The pipe shouldn't be heated with a blow lamp or hot-air gun. Minimum bend radii as follows:

- 10mm Qual-PEX                   45mm using pipe clips
- 12mm Qual-PEX                   60mm using pipe clips
- 15mm (or ½”) Qual-PEX       100mm using pipe clips (Or 90mm using angle brackets)
- 22mm (or ¾”) Qual-PEX       175mm using pipe clips
- 28mm (or 1”) Qual-PEX       300mm using pipe clips

- **What does the cross-linking do?**

Qual-PEX is manufactured from Silane cross-linked high density polyethylene. Cross-linking is a widely employed method of forging permanent links between polymer chains to form an interwoven three dimensional lattice within the pipe wall. This greatly reduces the ability of the polymer to creep with time and allows the burst resistance of Qual-PEX to be maintained almost indefinitely at high temperature. The cross-linking process is irreversible and is not lessened by continuous exposure to hot water.

- **Mechanical properties of Qual-PEX at 20°**

|  |                                       |
|--|---------------------------------------|
| Tensile strength at break              | 20mPa @50mm/min                       |
| Elongation at break (minimum)          | 150%                                  |
| Impact strength (notched Izod)         | 900J/m notch                          |
| Coefficient of linear expansion (20°C) | $1.5 \times 10^{-4}/^{\circ}\text{C}$ |
| Coefficient of linear expansion (82°C) | $2.8 \times 10^{-4}/^{\circ}\text{C}$ |
| Brittleness temperature                | below -20 °C                          |

- **Is Qual-PEX approved for drinking water**

Yes. Qual-PEX is specifically tested and approved to carry drinking water by the WRc, a pre-requisite for the BS7291 kite mark.

- **Can Qual-PEX be buried in concrete?**

Yes. Concrete doesn't have an adverse affect on Qual-PEX and the pipe maybe buried directly in concrete (subject to bye-laws). However, in order to prevent heat loss, it's advisable to thermally insulate the pipe. Fittings must be protected against direct contact with concrete, at all times.

- **Can inhibitors be used on Qual-PEX?**

Yes. Inhibitors are recommended for all heating systems (chemical mix that should be added to the central heating system water to prevent corrosion and prolong the life of the system). To prevent sludging and corrosion in the heating system an inhibitor is used. Also with Qual-PEX barrier pipe, an EVOH barrier is utilised to reduce the ingress of oxygen into the heating system thus reducing the possibility of corrosion of ferrous parts in the heating system.

- **Does Qual-PEX reduce installation time and cost?**

Yes. Once the installer gets used to working with Qual-PEX up to 40% savings can be made in the labour.

- **What effect does hard water have on Qual-PEX?**

The smooth bore and flexibility of Qual-PEX prevents lime scale adhering to the inner surface of the pipe.

- **What effect does soft water have on Qual-PEX?**

None. Unlike rigid metal pipes, Qual-PEX is not dissolved or corroded by soft acidic water.

- **Can Qual-PEX be used on solid fuel central heating systems?**

Qual-PEX can be used on the secondary side of a solid fuel heating system provided that the nearest connection to the boiler is at least one meter away from the boiler and outside the fireplace. Qual-PEX should not be used for primary pipe work on gravity systems. (Generally the answer here would be no)

- **Can Qual-PEX be used on oil fired boilers?**

Qual-PEX can be used on oil fired boilers provided that at least one meter of copper tube is between the boiler and connection to the Qual-PEX pipe.

- **Can Qual-PEX be used on sealed central heating systems?**

Yes, provided the maximum system service temperature is less than 95°C.

- **Can Qual-PEX be connected directly to a boiler**

Yes. Qual-PEX can be connected directly to the boiler provided that **all 3** of the following are adhered to:

1. The boiler incorporates a high limit stat
2. The connections are outside the casing
3. These connections are more than 350mm from the heat exchanger

- **Can pipe jointing compounds be used with Qual-PEX?**

Yes. Both Boss White and Foliac compounds have tested satisfactorily with Qual-PEX.

- **Can Qual-PEX be used for gas pipe for carrying oil?**

No. Qual-PEX is only guaranteed for use with water.

- **Flow characteristics**

The bore of the Qual-PEX pipe is slightly different to that of copper or steel pipe of the equivalent outside diameter. The consequent reduction in flow rate for a given pressure head should be considered when designing a system – design flow rates, head losses and velocities.

- **Ducting and Insulating**

Qual-PEX pipe (as with copper) should be sleeved when passing through walls and protected from nails etc. when placed under floor boards or buried under plaster. (Some local authorities advise that all pipe work in screeded floors should be run in ducting to facilitate easy extraction in case of accidental damage). Under intermediate floors lagging isn't required on Qual-PEX pipe, but insulation should be used where Qual-PEX is run in unheated spaces, for frost protection and energy conservation. It should be noted that heat losses from Qual-PEX are less than those of rigid pipes, and Qual-PEX is resistant to bursting down to -20°C. The insulation must comply with BS6700 and BS5422, as for copper pipe.

All hot water storage vessels, pipes and ducts associated with the provision of heating and hot water should be insulated to prevent heat loss except for hot water pipes and ducts within the normal heated area of the building which contribute to the heat requirements of the building.

- **Electrical connections with Qual-PEX**

Since Qual-PEX is an extruded plastic material, Qual-PEX is an insulator and is not suitable for earthing electrical appliances. (Supplementary bonding in a bathroom or shower room will still be required between simultaneously accessible exposed-conductive-parts of equipment such as, between metal (class 1) appliances e.g. heaters, showers and accessible luminaries).

- **When do inserts have to be used?**

Inserts should be used on all push-fit fittings to support the pipe at the joint; none is required for copper pipes. Black inserts used for Tan Qual-PEX (Irish), grey insert used for White Qual-PEX (typically UK market) and orange inserts are used for Qual-PB pipes.

- **What a Qual-Fit joint comprises of?**

The joint basically comprises of a pipe, fitting and subcomponents.

*Connecting the Qual-fit joint:* Pipe is cut straight with secateurs, ensuring that the pipe is free from burrs and scratches. Use correct insert and place into pipe. Ensure that all cap nuts are tight on the fitting, visually check the internal components. Clearly mark the insertion depth on the pipe using the chevron marking provided. Push the pipe firmly and horizontally into the fitting. A secure joint has been made when the correct insertion marking is reached. After checking the correct insertion depth has been used, pull back on the pipe firmly to ensure the grab ring engages correctly.

*Disconnecting the Qual-fit joint:* Ensure that the system is fully depressurised. Hold the pipe firmly and push the pipe inward toward the joint. Place the demounting clip against the release collet. Press the demounting clip against the release collet and then pull the pipe releasing it from the joint.

Order of subcomponents: 'O' Ring followed by spacer, followed by grab ring and then cap nut with demounting collet.

- **Storage and handling of Qual-PEX**

Qual-PEX maybe stored horizontally or vertically but should be out of direct sunlight. Qual-PEX is stabilized to withstand limited exposure to ultra violet radiation or sunlight, but is not designed for permanent direct exposure. Under such conditions, ducting or lagging is required. The pipe should be supported throughout its length to avoid sagging.

- **Can Qual-PEX be painted**

Yes Qual-PEX can be painted with oil or water based paint. No cellulose based paints and thinners should be used.

- **How far can you go with 12mm Qual-PEX in relation to placement of manifolds?**

Regardless of pipe size, the recommended maximum circuit length for radiators is 30m, i.e. no radiator should be more than 15m from the manifold. If the distance is greater, the original manifold location should be changed or a second manifold location maybe required.

- **Qual-Fit assemblies and it's system performance (leave general)**

Qual-fit systems using either Qual-PEX or Qual-PB are guaranteed against any material or manufacturing defect for a period of 25years under normal service conditions. This applies to all types of mains fed and pressurised plumbing systems and both open-vented and sealed heating systems subject to operating limits specified in BS 7291.

| <u>System Type</u>    | <u>Max System Working Pressure</u> | <u>Max System Service Temperature</u> |
|-----------------------|------------------------------------|---------------------------------------|
| Cold Water            | 12 Bar                             | 20°C                                  |
| Hot Water             | 6 Bar                              | 95°C                                  |
| Open vented CH System | 3.5 Bar                            | 95°C                                  |
| Sealed CH System      | 3 Bar                              | 105°C                                 |

- **Pressure testing of a system**

Low pressure test → 3 Bar (water or air) for 15minutes  
 High pressure test → 6 Bar (water or air) for 1 hour

- **Vermin issues**

Qual-PEX pipes and fittings will need special protection in vermin infested areas.

- **Pressure conversions**

Bar → PSI 14.503861  
 PSI → Bar 0.068948

- **Can antifreeze be mixed with water in a radiant heating system?**

Vanguard has tested and approved glycol for use in Qual-PEX tubing, and recommends a 50/50 glycol/water mix for max freeze protection. Typical automotive antifreeze is not recommended due to many additives in automotive antifreeze, which have not been approved for use with Qual-PEX. However, guarantee for 25years can't apply.