

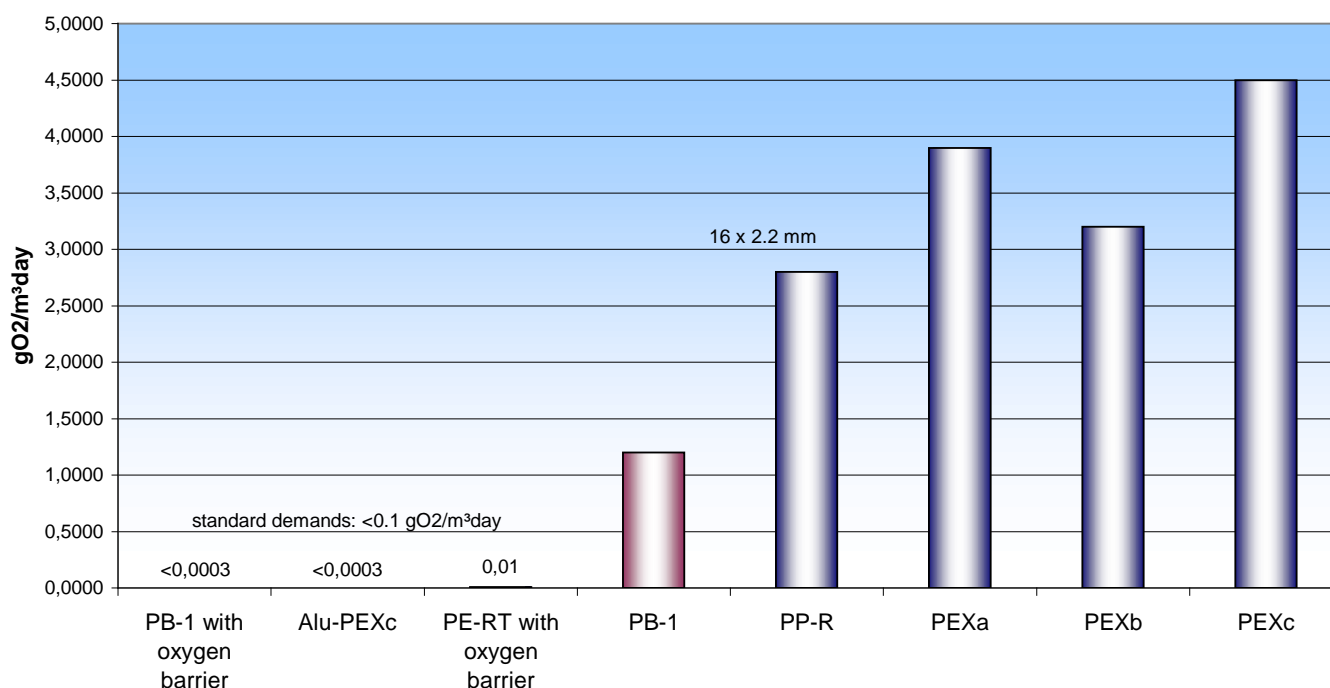
Oxygen permeation resistance

1) Basic Information

Corrosion of metals and metal components in heating and water supply installations will occur due to the presence of free oxygen in the water. Oxygen will almost always be present in any system as it can enter through a number of points, such as open header tanks, valves, threaded joints and pumps, and also through gas permeable materials.

2) Grafic overview

**Oxygen Permeation on 16 x 2 mm (2.2 mm for PP-R) pipes at 40°C
tested at Kiwa/ NL (acc. to DIN 4726)**



3) Results

In closed loop heating systems with **Underfloor Heating**, minimisation of oxygen ingress through the pipe wall will significantly reduce the occurrence of corrosion. For this reason, Polybutene-1 barrier pipe has been developed. Barrier pipe consists of 3 or 5 concentric co-extruded layers of material which are combined into one integral pipe wall. In a 3-layer structure, Polybutene-1 constitutes the inner layer and ethylene vinyl alcohol copolymer (EVOH) the outer layer. The central layer is an adhesive material which is compatible with both the inner and outer functional materials to form an integral structure. EVOH is the oxygen barrier material that has extremely low oxygen permeability characteristics.

In larger **District/Group Heating systems** plastic pipes are contributing only a fraction of the oxygen measured in those systems. Small amounts of oxygen will enter all heating water circuits whatever the type of pipe used, and therefore to protect the system against the effects of corrosion, inhibitors are added to the circulating water.

Another important measure to reduce the oxygen inflow is a separation of the District Heating system from the heating systems in the individual houses by Heat Exchangers.

4) References/Standards

Important indications are the requirements of the local District Heating companies and the Associations.

Technical data are subject to alteration.

