
TECHNICAL BULLETIN TB196

OXYGEN DIFFUSION THROUGH RAUPEX[®] O₂ BARRIER PIPE

Product: RAUPEX O₂ Barrier Pipe

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In typical hydronic radiant floor heating and snow and ice melting systems, hundreds or thousands of feet of RAUPEX pipe will be used, providing a large surface area for potential permeation of oxygen. The placement of the pipes within concrete does not protect the system, as concrete is porous and oxygen will pass through easily.

Therefore, the uncontrolled permeation of oxygen into closed hydronic heating systems is an important issue for designers of these systems. In systems with ferrous elements, the extra protection of RAUPEX O₂ Barrier pipe with co-extruded ethylene-vinyl alcohol (EVOH) oxygen diffusion barrier is recommended.

The oxygen diffusion barrier on RAUPEX O₂ Barrier pipe limits oxygen permeability, in accordance with DIN 4726, the globally accepted standard for limiting oxygen permeation. This helps protect ferrous elements from corrosion. DIN 4726-2008 requires designers of systems that include pipes with oxygen permeability greater than 0.32mg/(m²*d) at 40°C or 3.60 mg/(m²*d) at 80°C (see *note*) to take actions to protect the system from corrosion. RAUPEX O₂ Barrier pipe has been tested according to DIN 4726 and has been shown to have oxygen permeability limits below the maximum threshold defined in the standard.

Uncoated polymer pipes (including PEX) allow a certain degree of gas permeability that can lead to corrosion in systems with ferrous (iron or steel) elements. Uncoated (non-barrier) pipes can allow oxygen (O₂) to pass through the pipe wall, dissolve in the heating fluid and corrode iron or steel components such as pipes, valves, pumps and the boiler itself.

Note: Previous versions of DIN 4726 measured the permeability of oxygen in a volumetric manner with a limit of 0.10 g/(m³*d). The latest version has revised this to the numbers shown above based on a surface area calculation.

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