

Why Closed-Cell Flexible Elastomeric Foam Insulation on Cold Systems?

Mechanical insulation on cold (below-ambient) mechanical systems such as chilled water, brine and refrigerant piping/equipment is an important component to ensure that a project team's basis of design (BOD) and owner project requirements (OPR) are satisfied.

Concerns that drive high-performance system design include condensation control, energy optimization, corrosion under insulation (CUI), low-VOC materials and mold/mildew growth to name a few.

When a cooling system pipe is designed to convey fluids with a service temperature below the expected ambient temperature of the project, vapor drive is a constant threat to the mechanical system's piping and components. Condensation development on the surface of the insulation, icing, water vapor transmission under the insulation and resulting mold/mildew growth are real threats. The proper insulation type, thickness, supplemental vapor retarder and/or jacketing can manage all of the factors that can damage a mechanical system and surrounding equipment.

Fiberglass pipe insulation, which typically consists of open-cell fibrous insulation covered with an all-surface jacket (ASJ), is commonly specified and installed on all types of piping systems and temperatures due to a favorable material and installation cost.

While fiberglass insulation is an excellent choice for at or above-ambient temperatures, there are a few factors to take into consideration when selecting the appropriate insulation type for below-ambient systems. When the ASJ of fiberglass pipe insulation is not properly sealed or punctured, water vapor can permeate (wick) into the open-cell fibrous insulation. This results in a steady loss of thermal efficiency, mold/mildew growth, water damage to building components below and potential pipe corrosion. When this occurs just once, or on a recurring basis, the repair, replacement and system downtime costs to building owners can add up.

Aerocel® EPDM flexible closed-cell elastomeric insulation, also known as cellular foam and rubber, is a proven alternative to fiberglass on chilled water and refrigerant systems (piping, pumps, tanks, vessels & spheres) due to its hydrophobic chemical composition, closed-cell structure, built-in vapor retarder and inherent resistance to microbial growth. Aerocel products do not require the addition of biocides during manufacturing and are GREENGUARD Gold Certified for low chemical emissions. Unless Aerocel will be subjected to extreme environmental conditions, such as very cold service temperatures in high ambient temperatures and relative humidity, or the potential for mechanical damage, a supplemental vapor retarder (jacket) is not required.

It is well documented that mechanical insulation delivers one of the fastest returns on investment, of all building materials, to building owners. When factoring in the material and installation costs of jacketing fiberglass insulation, coupled with potential repair/replacement costs, Aerocel EPDM pipe and equipment insulation can deliver favorable life cycle costs to building owners.

To learn more about Aeroflex USA's insulation system solutions, please visit <https://www.aeroflexusa.com/aerocel-hvac-pipe-insulation>.