

POLYMER COMPARISONS - PHYSICAL PROPERTY CHARACTERISTICS NBR / VS. EPDM ELASTOMERIC INSULATION MATERIALS

Traditionally, elastomeric insulation has been manufactured from an NBR (Nitrile Butadiene Rubber) Polymeric Blend. Nomaco standard black elastomeric insulation products (tube and sheet) are produced from a UV resistant NBR Polymeric blend. Recently, a competitor has introduced an insulation product based suggesting it is based on the polymer EPDM (Ethylene Propylene Diene Methylene). A comparison of insulation products based on an NBR Polymeric Blend vs. EPDM will illustrate some of the similarities and differences:

Flame and smoke properties

NBR Polymeric Blend insulation products have a flame and smoke rating of 25/50 through 1-1/2" wall. The flame-retardant additives used to manufacture EPDM-based insulation create high levels of smoke making it difficult to meet this specification. Recently introduced EPDM insulation products may not meet this standard.

Strength properties.

NBR Polymeric Blend insulations have excellent tensile strength, tear resistance, abrasion resistance, and compression-set resistance. These strength properties make the insulation easier to install and more durable over time. EPDM-based products generally have poor tear and abrasion resistance.

Temperature limits

Air will not easily permeate the cell walls of NBR Polymeric Blend Foams. EPDM on the other hand is more permeable. At higher temperatures air permeability could result in EPDM shrinkage. Shrinking appears in the form of wrinkled skin surface and shortened lengths. The effect of this shrinking is added stress on the sealed joints and exposed tubing lines.

NOMACO INSULATION elastomeric insulation is flexible to -40° F and has a lower temperature limit of -70°F. The lower temperature flexibility and lower temperature limits of NBR Polymeric Blends meet or exceed the requirements of common installation practices and refrigerant line temperatures.

Water resistance

NBR Polymeric Blends and EPDM are equally resistant to moisture. However, EPDM's susceptibility to tearing and abrasion can affect the integrity of the skin surface and cell structure, hampering the normal resistance to water and water vapor.

Weather resistance

Both NBR / PVC and EPDM are UV resistant. EPDM is commonly believed to be more resistant than NBR based insulation products. For moderate UV exposure applications (suction line from heat pump to house) no additional UV protection is needed. For severe UV exposure applications (roof top applications) it is customary, based on the diversity of weather conditions in the United States, to coat NBR based insulation products with a water-based acrylic resin coating. Protective coatings reduce premature aging attributed to UV, and other weather related elements like, wind, rain, snow, and ice. These coating adhere very well to the NBR based materials. Additionally, the strength properties of NBR based products provide added protection against damage from equipment maintenance and wildlife. Coatings may not adhered as well to an EPDM based product.

Copper corrosion

NBR Polymeric Blends and EPDM insulation, when installed properly, do not corrode copper tubing.

Water Vapor Transmission Rates

The wvt values for NBR Polymeric based insulation products are low and they are considered to be low transmittance materials. EPDM based products may have higher wvt rates which will cause long term degradation of the materials insulation properties.

Thermal Conductivity

There are no significant differences between the thermal conductivity of NBR Polymeric Blends and EPDM based insulation materials based on the published literature of the two materials.

NBR Polymeric based flexible closed cell insulation products have been on the market for over 30 years. During this time, they have proven their effectiveness in conserving energy and preventing condensation on a wide variety of applications.