

Insulating Over Rubber Expansion Joints: A Good or Bad Idea?

By **Rob Coffee**
FSA Member

The practice of insulating over metallic expansion joints to minimize heat loss in a piping system may be common, but it is not a good idea to follow this same practice with rubber expansion joints.

Rubber expansion joints typically consist of synthetic (oil-based) elastomers (ethylene propylene diene monomer [EPDM], neoprene, chlorobutyl, nitrile or chlorosulphonated polyethylene-CSM) combined with polyester or nylon and wire reinforcing that provide pressure-restraining capability.

If an end user were to install a typical rubber expansion joint in a system needing insulation to cover the joint in a “hot” application, that

individual must consider the probability of failure resulting from heat exposure.

A rubber expansion joint that is covered by insulation will soak up heat from the fluids being pumped. When operating near the temperature limit of its constituent material, the rubber expansion joint may begin to lose its oil-based properties, drying out and causing the elastomers to become brittle.

Figure 1 depicts this deterioration of an elastomer expansion joint.

In addition, the pressure-restraining reinforcing materials (polyester or nylon) can start to break down under the heat. This could eventually lead to a catastrophic failure (see Figure 2).

Rubber expansion joints should be allowed to “breathe” to atmosphere in order to let the heat escape. This will keep the joint hydrated during operation. Atmospheric cooling helps maintain the operating temperature below the material limits and reduces the adverse effect of elevated temperatures.

Another question users ask is if they can use heat tracing to wrap around their joints. This is also not a good idea.

While heat tracing does provide benefits to the system by keeping piping at a constant or near-constant temperature, wrapping the expansion joint with heat tracing can concentrate the heat in a limited contact area, burning the outer rubber cover (typically

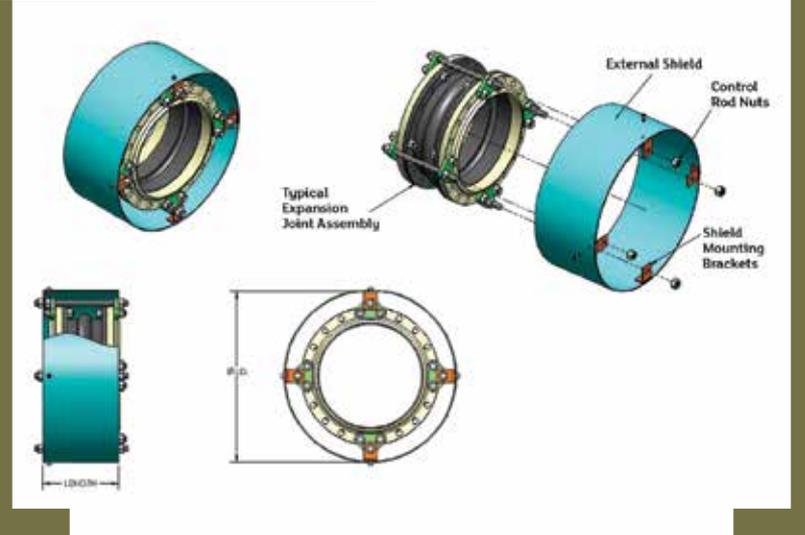


Figure 1. Damaged elastomer expansion joint from excessive temperature (Images courtesy of FSA)



Figure 2. Insulated joint failure

Figure 3. Metal cover option



1/16-inch thick) and working its way into the pressure-restraining reinforcing materials (polyester or nylon).

Over time, the expansion joint will become weak, which could result in a catastrophic failure.

If the two practices mentioned above are not recommended, how then should users keep heat loss to a minimum?

The thermal conductivity of elastomers is so much less than that of metal (two orders of magnitude) that they actually act as an insulator. The heat loss through an expansion joint is minimal compared with a metal pipe and even less compared with a metal expansion joint, which has a high surface area because of the multiple number of convolutions required to accommodate motion. So the need for additional external insulation to keep process thermal energy may not be necessary.

Some users incorporate metal covers, which are separated from the rubber expansion joints by metal clips attached to the bolt at the rubber expansion flange or the bolt of a control unit. The cover shields the rubber expansion joint from potential harsh external elements but allows the heat to escape from the expansion (see Figure 3). The cover helps shield the system from external conditions and protects personnel in high-traffic areas in the event of a failure.

As always, there are exceptions to the rule. Someone may ask about their chilled

water piping and the need to jacket the expansion joint to keep condensation to a minimum. In this case, insulating over a rubber expansion joint in a chilled water system is acceptable to keep condensation from forming.

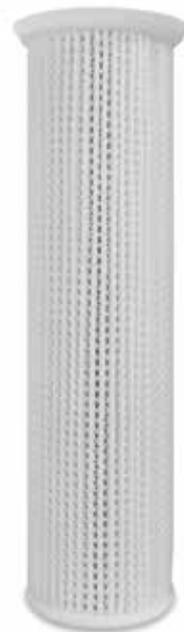
When the application is in question regarding whether or not to insulate over a rubber type expansion joint, the safe route for the joint's longevity is to avoid this common practice. ■

Next Month: Enhanced Mechanical Seal Face Materials: Substrate and Coatings

We invite your suggestions for article topics as well as questions on sealing issues so we can better respond to the needs of the industry. Please direct your suggestions and questions to sealingsensequestions@fluidsealing.com.



**PL Series
Bag-Sized
Cartridges.**



800.821.5373
RosedaleProducts.com

VISIT OUR BOOTH
CHEM SHOW 504

©2015 Rosedale Products Inc.
3730 West Liberty Rd. Ann Arbor, MI 48103
Phone: 734.665.8201
Fax: 734.665.2214
Filters@RosedaleProducts.com

Circle 148 on card or visit psfreeinfo.com.