Effects of Temperature "Spikes" on K-Flex PE Polyethylene Insulation

When selecting an insulation product, the temperature range of the application is a critical factor in selecting the correct insulation. The maximum and minimum temperature the application will experience should be compared to the temperature range the insulation manufacturer states is acceptable for their product. When applications may experience temperature spikes (high temperatures for a short duration) as a result of normal operation, equipment malfunction, maintenance etc., the selection of a suitable insulation must take these spikes into consideration. Spikes can occur during installation (brazing), temperature cycling (hot gas defrost), maintenance (steam cleaning of pipes), equipment malfunctions or a spike that may occur before the equipment shuts down such as in VRV and VRF systems.

K-Flex PE is a thermoplastic insulation material, and any temperature spike that exceeds the melting point of the product, even for a short duration will result in significant damage or complete loss of the insulation. K-Flex PE has a listed maximum operating temperature of 200°F and can withstand small (15°F maximum) temperature spikes above the stated maximum use (application) temperature. The maximum duration of the spike is dependent upon the specific product. Product with a PSA seam seal should not be exposed to extended spike durations as this may cause the PSA to soften and the seam to open. Seams sealed with an approved contact adhesive can withstand longer duration temperature spikes.

Where temperature spikes that would result in a temperature greater than 215°F are anticipated or possible, K-Flex USA recommends the use of one of our elastomeric insulation materials instead of K-Flex PE.

ASTM C411, Standard Test Method for Hot-Service Performance of High Temperature Thermal Insulation is the most commonly used test method to determine the maximum acceptable operating temperature, often in conjunction with ASTM C447, Standard Practice for Estimating the Maximum Use Temperature of Thermal Insulations. In ASTM C411 the test specimens are subjected to a 96 hour heat soak at a temperature determined by the manufacturer. The test specimens are then examined for cracking, delamination, warpage, sag, melting, dripping, flaming, glowing, smoldering, smoking and final thickness.

All K-Flex USA insulation materials have been tested in accordance with ASTM C411 at a temperature of 250°F (121°C), and meet the acceptance criteria as published in National Fire Protection Association Standard NFPA 90A. Note that sag, warpage, melting, dripping and final thickness are *not* part of this acceptance criteria, and K-Flex PE meets the NFPA 90A requirements.