December 15, 2020
Technical Bulletin #187

Subject: Boreal Nature Elite and cPVC Piping Compatibility

The chemical reaction that takes place during the application and curing of Boreal Nature Elite can generate exothermic temperatures 120°F above setpoint temperatures. Peak temperatures at the mid-thickness of a pass can exceed 200°F for several minutes. At the substrate and free surface of the rising foam, the exothermic temperatures will be lower.

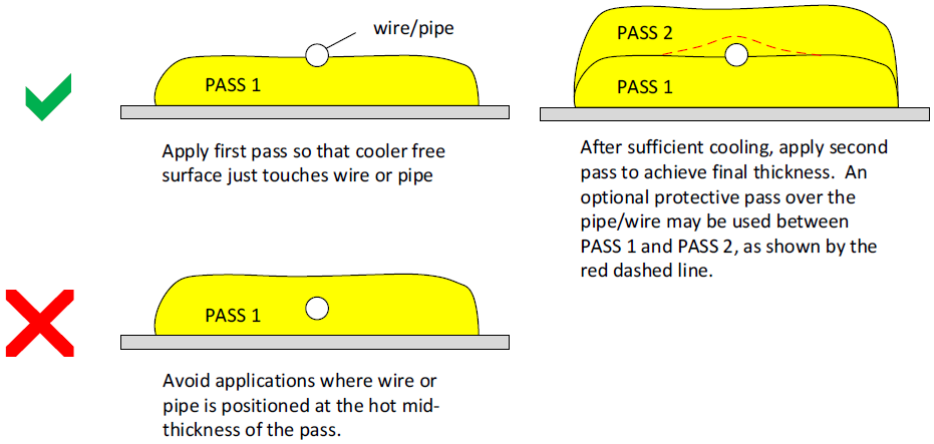
Chlorinated Polyvinyl Chloride piping is made from thermoplastic materials and will soften and melt at elevated temperatures. However, below the 'softening point', cPVC can withstand continuous elevated temperatures. Further, the shorter term (static) temperatures that the piping can withstand for short periods is much higher. The continuous use operating temperature of cPVC varies with service pressure. The static temperatures are determined in a pressure-free testing environment.

Chlorinated polyvinyl chloride	
Melting temperature (T_m)	150 ˚C (302 ˚F)
Glass transition temperature (T_g)	106 ˚C – 115 ˚C (223 ˚F – 239 ˚F)
Vicat softening point – 50 N (Vicat B)	106 ˚C – 115 ˚C (223 ˚F – 239 ˚F)

Continuous Operating Temperature (F)	Maximum Pressure Rating (psi)	Rated Static Temperature (F)	Maximum Exothermic Temperature of Boreal Nature Elite @ 50mm (F)
140	400	300	220

To avoid thermal damage to the cPVC, the installer should:

1. Never exceed the maximum 50mm pass thickness as defined by CAN/ULC S705.2. Maximum pass thicknesses control exothermic temperatures.
2. Always install Boreal Nature Elite to cPVC piping that is de-pressurized. Pipes may contain air but must not be pressurized during application.
3. Install Boreal Nature Elite so that the cPVC piping is not positioned in the mid-thickness of the pass. Shown below.



Apply first pass so that cooler free surface just touches wire or pipe

After sufficient cooling, apply second pass to achieve final thickness. An optional protective pass over the pipe/wire may be used between PASS 1 and PASS 2, as shown by the red dashed line.

Avoid applications where wire or pipe is positioned at the hot mid-thickness of the pass.

NOTE 1: Some plastic pipe manufacturers prohibit the application of spray foam over certain pipe fittings. The spray foam can be applied to the pipe, but the fittings must not be in direct contact with the foam. The installer needs to check on this prior to spraying foam around any plastic pipes. To avoid chemical contact with fittings, the installer can wrap the fittings in aluminum foil prior to foam application to provide a chemical barrier.

NOTE 2: If any spray foam liquid is spilled on plastic pipes, the liquid must be cleaned off immediately. Do not spray over a plastic pipe that has spilled chemical systems liquid on it.

NOTE 3: Water supply piping should not be located either outside or within the insulation inside exterior walls. These pipes may freeze during extreme cold temperatures. As an insulation contractor you should caution builders about location of any water piping positioned inside thermal insulation in exterior walls and suggest placing all water lines completely inside the thermal envelope of the building.

To be certain, Boreal Nature Elite will not damage cPVC piping if best practice installation methodology is implemented.

Mike Richmond
Vice President Compliance & Building Science
Genyk Polyurethane