

Aquatherm Technical Bulletin

201408B -AQTTB

Static Electricity

Date Issued: 7 August 2014

Static electricity is caused by the contact and separation of two materials, one of which has a high electrical resistance. The difference in resistance causes an imbalance of electrons with one of the materials having a positive charge and the other material having a negative charge. When the two materials come into close proximity you get a static electricity discharge.

Humidity is a major influence on static electricity. Water vapor increases the electrical conductivity of air which allows built up charges to dissipate easily into the environment. Therefore, dry environments allow for more static electricity buildup and humid environments have less static electricity buildup. Damage caused by static electricity often occurs below human sensitivity and is therefore often unseen or unheard. However, if a static electricity discharge occurs in a flammable or explosive environment, the results can very well be felt and heard, many times with catastrophic results.

The surface resistance of an Aquatherm pipe is 1014 Ω (Ohms) and the specific resistance is 1017 Ω (Ohms); therefore, the pipes are good insulators and will not conduct electricity. Due to this low conductivity of Aquatherm pipe, electrons cannot travel along the surface of the pipe to a single point of discharge resulting in all static discharges being localized. In other words, discharging the static electricity in one point of the pipe does not release the buildup of static electricity in a spot even just a few inches from the original point of discharge. The new point of discharge may or may not have a higher electrical charge built up than the first point of discharge.

In Aquatherm pipe static dischargers are a potential solution to eliminate static buildup, but they will only discharge the electric build up in local areas and not across the entire pipe, as noted above. Currently, the spacing of dischargers needed to prevent static buildup across the pipe is unknown, and, therefore, not recommended.

Due to the properties of the Aquatherm pipes, static electricity may build up if used for pneumatic transport of non-liquid materials such as gravel, sand, grain, powders, etc. Therefore, Aquatherm is not recommended for use in these applications.