



Ultraviolet (UV) Radiation Exposure of PVC Pipe Products

Industry Research

The Uni-Bell PVC Pipe Association provides extensive information on this subject in their Technical Report UNI-TR-5-03, *The Effects of Ultraviolet Radiation on PVC Pipe*. Data in this report shows that pipe made with standard PVC material and exposed to UV radiation from the sun for two years suffers no adverse effects on the tensile strength or modulus of elasticity of the pipe. There is some decrease in the impact resistance in the pipe, although on average, impact levels remained above minimum levels prescribed by industry standards. There may also be some product discoloration, but it is typically limited to a very thin layer (approximately 0.002") on the exterior of the pipe. Once the pipe is installed and underground, there is no further effect of the sun on the pipe.

Appendix A of UNI-TR-5 provides even more evidence that PVC pipe can withstand long-term sunlight exposure. This section details an evaluation of C905 14" DR 18 pipe exposed to the sun for over fifteen years that exhibited extreme color fading. Even with this long-term UV exposure, the pipe still exceeded the physical requirements established by the Canadian Standards Association (CSA) and American Water Works Association (AWWA) for this product.

Standard PVC Pipe Material Products

NAPCO's standard PVC material products are formulated with titanium dioxide to limit damage from ultraviolet radiation for two years of exposed outside storage in the United States and Canada. If it is anticipated that these products must be stored in direct sunlight for more than two years, we recommend that they be covered with an opaque material that permits adequate air circulation around the PVC pipe products. Proper air circulation prevents excessive heat buildup that will damage the pipe.

When PVC pipe products are properly covered and not exposed to sunlight, the allowable storage time is unlimited. The two-year criterion is a cumulative value of the time the product is in exposed storage and is not based on the date of manufacture.

It is important for the gaskets supplied with each product be checked for hardening or cracking prior to assembly and installation. If a gasket has become hard or cracked, the product should not be used. In all cases, proper installation techniques must be followed.

Yelomine® PVC Pipe Products

Products made with our Yelomine material (including Certa-Set®) have a specially formulated PVC compound that contains impact modifiers and UV inhibitors. This proprietary formulation provides up to 6x the impact strength of standard PVC pipe material over an extended period of time allowing for these products to be used aboveground and in high-impact environments. The aforementioned two-year exposure rule does not apply to Yelomine products.

This Technical Bulletin is published for general informational purposes only and is not intended to imply that these materials, procedures, or methods, are suitable for any particular job or should be relied on by the user. Materials, procedures, or methods may vary according to the particular circumstances, local building code requirements, design conditions, or statutory and regulatory requirements. While the information in this Technical Bulletin is believed to be accurate and reliable, it is presented without guarantee or responsibility on the part of NAPCO. User is solely responsible for usage of any material, procedure, or method contained herein.