

Important Information

Properties Of HDPE Pipe

High density polyethylene pipe (HDPE) has several properties that make it very different from “traditional” water works pipe materials:

- **Coefficient of thermal expansion** is over 10 times that of DI and steel and 3 times that of PVC. In practical terms, this means HDPE pipe shrinks 10 times as much as DI and 3 times as much as PVC when it gets cold. This can loosen any fittings installed on it. Also, its length shrinks 1 inch per 100 feet of pipe length with a 10° F temperature drop, making it likely to pull out of unrestrained couplings.
- **Yield strength** of HDPE is approximately 1/50 that of DI or steel and 1/3 that of PVC.
- **Modulus of elasticity** of HDPE is much lower than other pipe materials, which means it is not as rigid.
- **Creep** is continuous yield of material under stress. HDPE will creep if the stress placed on it gets above a certain level. If great care is not taken when designing fittings for use on HDPE pipe, this stress level can be exceeded and fittings that work great today may fail later as the HDPE creeps.
- **Low coefficient of friction** means HDPE is very “slick.” This makes it easy for fittings to rotate on the pipe or migrate along it.
- **Toe-in** occurs when HDPE is cut. This can affect tapping sleeves and saddles, and makes stiffeners difficult to install in pipe ends.

Limitations of Repair Products For Use On HDPE Pipe

HDPE has a lower modulus of elasticity and higher coefficient of thermal expansion than other pipe materials. These properties cause HDPE pipe to expand and contract much more from changes in temperature and/or pressure than other piping materials. Because of these and other properties, great care must be taken in choosing fittings and repair products for use on HDPE pipe. Repair products in this catalog section are designed to function within the following limitations:

- Pipe must be manufactured in accordance with AWWA Standard ANSI/AWWA C906-90 / with respect to size.
- Operating temperatures are limited to 85° F maximum and 32° F minimum.
- Operating pressure is limited to 150 psi or the rating of the pipe, whichever is less.
- Pipe systems must be designed to compensate for pipe movement so as to prevent fittings from migrating or rotating on the pipe.
- Products are intended for use in underground service only.
- Internal pipe stiffeners must be used when coupling pipe ends.
- Proper restraint must be used when coupling pipe ends to prevent pullout from hydraulic forces or temperature changes.