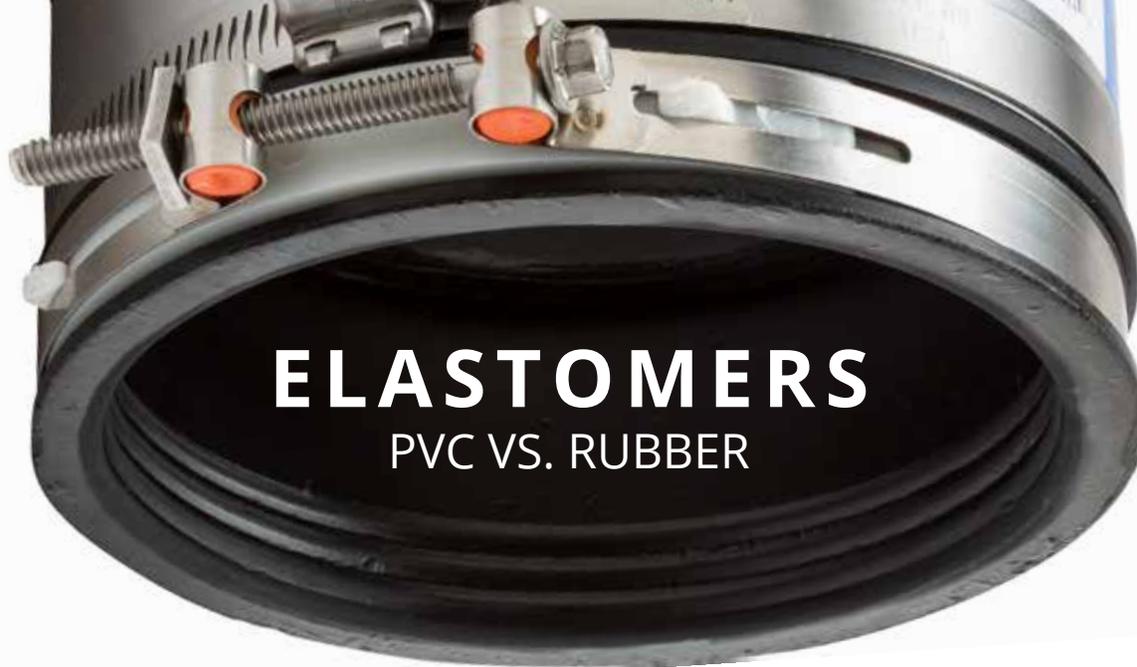




ELASTOMERS

PVC vs. Rubber





ELASTOMERS

PVC VS. RUBBER

The elastomeric materials used in flexible couplings are grouped into two performance orientated categories in **ASTM C1173**:

Type A (*Plasticized PVC*)

Type B (*Vulcanized Rubber*)

The performance of these materials varies dramatically over time. Internationally, the overwhelming trend is for local bodies to specify exclusively vulcanized rubber elastomers. This choice is made simple due to the ***long term advantages vulcanized rubber elastomers*** offer over plasticized PVC.

Stress relaxation and compression-set are very important parameters for long term performance.

STRESS RELAXATION

A coupling achieves and maintains an effective seal by resisting compression under stress, thus imparting an interface pressure against the pipe surface. Over time all materials will relax under this pressure and the seal effectiveness will be diminished. The elastomers ability to resist this relaxation determines the overall amount of time it will retain an effective seal.

ELASTOMERS: PVC VS. RUBBER

PVC materials typically relax at a rate of 15% per decade, compared to 6% relaxation per decade of rubber. From the same initial contact pressure, the higher rate of relaxation of the PVC material leads to rapid deterioration, whereas rubber elastomers retain an effective barrier against infiltration, exfiltration and root intrusion for the life of the piping system.

COMPRESSION SET

This property of an elastomer is probably its most essential. A seal under compression must not lose its resistance to being compressed. The PVC specification does not define this property. Plastics have poor resistance to compression-set.

Why is compression-set important to an elastomer? An elastomer must fit tightly between two fixed surfaces. If the fit isn't tight, fluid will leak between the two fixed surfaces and the purpose of the elastomer is violated. In the case of elastomeric PVC, even worse will happen. By its chemical nature ***PVC has little or no resistance to compression.*** Furthermore, the plasticizer which makes the PVC non-rigid will migrate, leach and dissipate causing the elastomer to shrink.

The chemical bonds which connect the individual polymers within a rubber compound provide the primary resistance to compression. Plastics are void of such chemical bonds and consequently, have poor resistance to compression.

Plastic and uncured rubber are both polymers. Polymers are essentially long chains of carbon atoms. Vulcanized or cured rubber has tiny coil springs between the carbon chains. The tiny coil springs are actually made of sulfur atoms which attach to themselves in the form of a coil spring and these sulfur coil springs chemically connect two chains of carbon atoms. Now imagine the two carbon chains being compressed instead of being extended. When released these coil springs will return the carbon chains to their original position.

For these reasons Mission ***Flex-Seal® ARC Shielded Adjustable Repair Sewer couplings use only vulcanized rubber.***

