

# How do PVC PIPING SYSTEMS COMPARE WITH OTHER MATERIALS?

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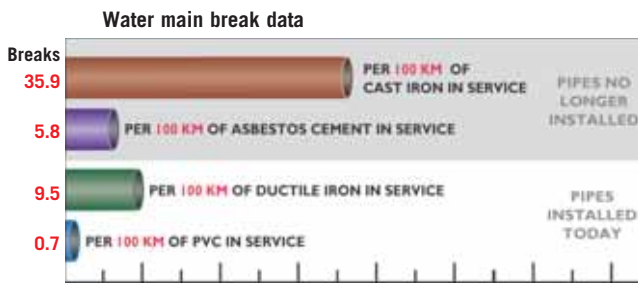
## MUNICIPAL PIPING SYSTEMS

Although PVC piping systems are the most frequently specified materials for water and sewer systems, engineers and designers are still asked to compare the various materials available and explain their choice based on technical grounds.

### BREAKAGE RATES<sup>1</sup>

#### Blue Brute® and CycleTough® Systems

Independent research confirms PVC has the lowest break rate of any installed water main material – less than 1 break/100km/year.



#### Ductile and Cast Iron

Cast iron has a break rate 50 times greater than PVC. Ductile iron, while of comparable age to PVC systems, has a break rate more than 10 times that of PVC.

### CORROSION

#### Blue Brute and CycleTough™ Systems

Corrosion-proof performance. PVC systems have been operating successfully for more than 50 years.

#### IPEX Big Brute System

Corrosion-proof, with a minimum 100 year design life.

#### Ductile and Cast Iron

Corrodes in aggressive soils even when time-consuming and expensive corrosion control measures are used.

#### Concrete Pressure Pipe (PCCP)

Pre-stressing wires often corrode, resulting in a new industry dedicated to identifying PCCP at risk of corrosion failure.

Construction Technology Laboratories (CTI) Inc. have investigated over 20 PCCP failures in the Eastern U.S. and commented that corrosion, poor installation and loose standards contributed to the over 60 failures in the Eastern U.S. "Owners we have dealt with believed that their PCCP systems would have a 50 to 100 year life. What we have found is that there is a high probability that will not be the case."

### HAZEN-WILLIAMS 'C' FACTOR

#### Blue Brute, Big Brute and CycleTough® Systems

Proven long-term 'C' factor of 150. High 'C' factor reduces pumping costs and allows for increased flows.

#### Ductile and Cast Iron

Proven long-term deterioration in 'C' factor. Tuberculation can occur as a result of internal corrosion, resulting in recorded 'C' factors of less than 100. Internally corroded iron pipe has been cited in many cases of poor fire flows.

### FIELD CUTTING

#### Blue Brute, Big Brute and CycleTough® Systems

All lengths can be field cut.

#### Ductile and Cast Iron

Field cutting is complicated by pipe standards that allow pipe to be out-of-round at all points other than the spigot end. This is a potential source of leaks.

#### Concrete Pressure Pipe

Field changes require new custom-made pieces to be fabricated. Repairs can take weeks while new closure pieces are fabricated.

### FIELD TAPPING

#### IPEX Big Brute System

Can be field tapped using standard saddles and fittings.

#### Concrete Pressure Pipe

Can only be tapped by specially trained personnel who know



how to cut the pre-stressing wires without compromising the structural integrity of the pipe. It amounts to a time-consuming, expensive and tricky process.

<sup>1</sup> National Research Council, "Survey of Watermain Breaks"

## GRAVITY SYSTEMS

### JOINTS

#### IPEX Ring-Tite® / Enviro-Tite® and Ultra-Rib® Systems

Deep-belled, tight-jointed systems third party certified to withstand a 50 psi hydrostatic pressure. Properly installed joints will allow zero infiltration or exfiltration.

#### Reinforced Concrete Pipe

Smaller diameter joints (<600 mm) may withstand a 13 psi hydrostatic pressure, however high infiltration limits are recommended for testing. For example, in a permeable soil with an average groundwater head of 3.7 metres, the infiltration allowance for a 1200 mm pipe is over 31,000 litres per kilometer of pipe per day!<sup>2</sup>

### CHEMICAL RESISTANCE

#### IPEX Ring-Tite™ / Enviro-Tite™ and Ultra-Rib™ Systems

Immune to hydrogen sulphide attack, as well as chlorides and aggressive industrial chemicals.

#### Reinforced Concrete Pipe

Hydrogen sulphide attack causes millions of dollars in damage to concrete and metal components of sanitary sewers each year.

Sulphuric acid attack causes concrete to turn into gypsum, compromising the structural strength of the sewer. Concrete is also vulnerable to chloride attack, which is especially devastating in northern climates.

### PHYSICAL PROPERTIES

#### IPEX Ring-Tite® / Enviro-Tite® and Ultra-Rib® Systems

- Flexible pipe, which responds to loads by deflecting.
- Glass-like internal finish resulting in a Manning's "n" coefficient of 0.009. This is supported by a large body of independent research (see Unibell Handbook).
- Long laying lengths of 13 ft. Longer lengths can be ordered. This results in fewer joints and faster installation.

#### Reinforced Concrete Pipe

- Rigid pipe, which responds to loads by cracking.
- Rough internal finish resulting in a Manning's "n" coefficient of minimum 0.013. This is also supported by a large body of research.
- Short laying lengths of less than 6 ft. for smaller diameters. This more than doubles the number of joints per installation, and the joints are relatively loose when compared to PVC (13 psi vs 50 psi).



# IPEX



IPEX is uniquely positioned as a one-source supplier of non-corroding pipe, fittings and service lines that don't just fit, but match. Systems that are:

- Corrosion-resistant
- Immune to chemical attack
- Joined with bottle-tight seals

As a leader in thermoplastic piping systems for over 50 years, IPEX provides proven products that have withstood the rigors of time – from large diameter transmission pipelines to 3/4" house connections.

<sup>2</sup> Ontario Concrete Pipe Association, Concrete Pipe Design Manual