

PVC tops pipe joint performance tests

In tests conducted by the CSIRO Building, Construction and Engineering Division in conjunction with Iplex Pipelines, to measure the resistance of various pipe materials joints to root penetration, PVC pipes came out with a perfect score in that there was nil root intrusion in any of the samples tested.

This compares with penetration of 87% for vitrified clay pipes (VC) and 37% for fibre reinforced concrete (FRC) in accelerated trials over a period of 32 months.

This is despite that PVC was tested with a ring system having a much lower interfacial pressure compared to VC and FRC joints.

It is accepted that low interface pressures promote ease of root intrusion, but the tests also concluded that porosity and surface roughness of the pipe material played a major role in joint failure.

In this respect the impervious nature of PVC, together with its smooth inner and outer wall, and its ability to withstand ground movement, thermal expansion, and contraction, make it ideal sewer and storm-drain pipe.

The consequences of inadequate sewer pipelines abound in all major Australian cities, from tree root intrusion to cracked pipes caused by ground settlement.

This leads to pipe blockages, ground water infiltration and sewage exfiltration.

Infiltration through pipe joints or cracked pipes can cause silting of pipelines as well as larger weather inflows into the sewerage system which raises operating and installation costs, as larger capacity pipes and effluent treatment facilities are needed.

In extreme cases infiltration leads to overflows and untreated discharges being made by utilities.

Exfiltration through pipe joints can lead to contamination of ground water and waterways and cause a public health hazard.



TEST HIGHLIGHTS FOR ELASTOMERIC SEAL JOINTS:

Root penetration accelerated trials over a 32-month period:

Types of pipe	Percentage of root penetration
PVC pipes	0%
Vitrified clay pipe	87%
Fibre reinforced concrete pipe	37%

Note: The PVC test assemblies were completed with solvent weld end caps and elbows. Not a single solvent weld joint suffered plant root intrusion.

Refer to PIPA's Technical Paper [TP001 The resistance of elastomeric seal pipe joints to tree root penetration](#) for more information on the test program and conclusions.

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