

Joint Sealant Leak Detection Chamber

Applications

The Leak Detection Chamber range are designed to test joint sealants in concrete structures. Joint sealants have a high likelihood of local imperfections causing local leakage paths. This may be within the sealant or more likely at the sealants interface with the concrete. In some cases, particularly where the consequence of failure is high, risk (the product of likelihood and consequence) should be lowered by reducing the likelihood of failure.

In road pavements failed joints can lead to pumping and undermining. On major roads the ensuing repairs have an extremely high cost to the community. In water retaining structures joint failure leads to leakage and in extreme cases could lead to failure of the facilities leak tightness test. In both cases reducing the likelihood of failure by testing the installed sealant makes good economic sense.

Design

Where an air pressure differential exists across a leak, air flow through the leak will cause bubbles to form in a foaming solution on the low pressure side of the leaks surface. This is how we find punctures in bicycle tyres. The principle is applied in many industries to find leaks. In general a foaming solution is applied over the material to be leak tested and then a vacuum is applied over the surface. Air flow through the leak and foaming solution produces bubbles which can be observed through a viewing glass.

Papworths have developed a range of chambers through which a vacuum can be applied to a length of joint sealant. From small hand held boxes for wall joints to large self contained wheeled rigs (photo right) there is a design to meet the needs of most projects.

The chambers can be built with a petrol motor driven vacuum pump or an electric vacuum pump. The vacuum pump and motor can be built onto the wheeled chamber for floor testing or it can be a separate unit for hand held chambers. The width of the chamber is 150mm standard but can be increased appropriately to test joint bandage systems.

Materials

Chambers	Machined from aluminium billet.
Valves	Quick opening to release the vacuum
Pressure gauge	Shows when the unit has been drawn down
Gaskets	Neoprene rubber
Motor/Pump	General Electric
Glass	6mm toughened

Leakage Testing

1. A liquid foaming solution is applied to a section of the joint.
2. The chamber is located over the treated joint.
3. The vacuum release valve is closed and the vacuum pump valve opened. The pump sucks air through any leaks and the foaming solution and bubbles form.

