

Install safety

Insulated piping is typically required for the transportation of fluids between plant equipment, this is typically bundled in horizontal and vertical 'chases' for simplicity of structural and mechanical design, construction, access for maintenance, and cost-effectiveness.

However, vertical pipe chases also provide a means assisting flame spread during a fire incident. Combustible materials located in pipe chases are the primary means of spread of fire in these elements. Insulation of building services is a performance regulated requirement with regard to energy efficiency and fire resistance. The proliferation of different types of pipe insulation products in the Australian building industry is justification of the viability of this specialist sector and highlights the necessity to ensure these products are fit-for-purpose.

Unfortunately, requirements for fire compartments with FRL rated elements are not always implemented in practice as-designed, and not all buildings will perform as intended under fire conditions. Pipe insulation that does not promote fire spread in this application provides both primary and secondary means of minimising the spread of a fire event between fire compartments.



NFPA274 Test Rig, three uninsulated pipes prior to insulation cladding

Existing NCC BCA fire performance requirements are determined by regulatory fire indices that are, by their own admission, not designed to assess highly flammable plastic-type materials that demonstrate the ability to shrink or melt away from a small heat source. Once involved in a fire, these types of materials are able to propagate a fire at an alarming rate. While these same limitations are currently noted at the foot of every test report, this does not excuse the requirement for a product to demonstrate fitness for purpose in its intended application.

Changes to the status quo are necessary, highlighted by the current situation where even though the in-situ fire behaviour of different products varies greatly, all continue to achieve similar Spread-of-Flame and Smoke-Developed indices.

The limitations of existing small-scale fire test methods are exposed by over 15 years of test data to National Fire Protection Association (NFPA) 274 Standard Test Method to Evaluate Fire Performance Characteristics of Pipe Insulation, the Vertical Pipe Chase method. This method, now publically available in Australia through Exova Warringtonfire, allows pipe insulation material to be tested as-installed, around a pipe, in the critical vertical orientation commonly found in buildings.

The positioning of the fire source below the test specimen highlights the failings in highly flammable insulation materials that may ordinarily achieve compliance through an ability to shrink or melt away from a small heat source.

The NFPA 274 the vertical pipe chase



Fire source positioned below the horizontal legs of three insulated pipe test specimens



Flame propagation up vertical leg of three insulated pipes

standard test method provides a realistic assessment of the fire performance of pipe insulation products at the time it is most required, during a fire event. The NFPA 274 test maintains the lower costs associated with small-scale test methods for the purpose of demonstrating regulatory compliance. Considering the importance of the 'right' fire performance characteristics of pipe insulation products, and the effects of building in sub-standard performance, the cost-benefit ratio is both positive and easily justifiable on any commercial project.

The vertical pipe chase standard test method provides a realistic assessment of a pipe insulation product's fitness-forpurpose in addition to meeting minimum regulatory performance requirements. It represents the new standard for entry into the Australian building industry pipe insulation market.

Changes to NCC minimum fire performance criteria for pipe insulation are years away, through the adoption of a NATSPEC specification, the Vertical Pipe Chase standard test for pipe insulation products can be implemented at no cost, by specifying Armaflex products that are already well recognised in the Australian market. Manufacturers, specifiers and fire authorities can include NFPA 274 requirements for pipe insulation products at their discretion today.

