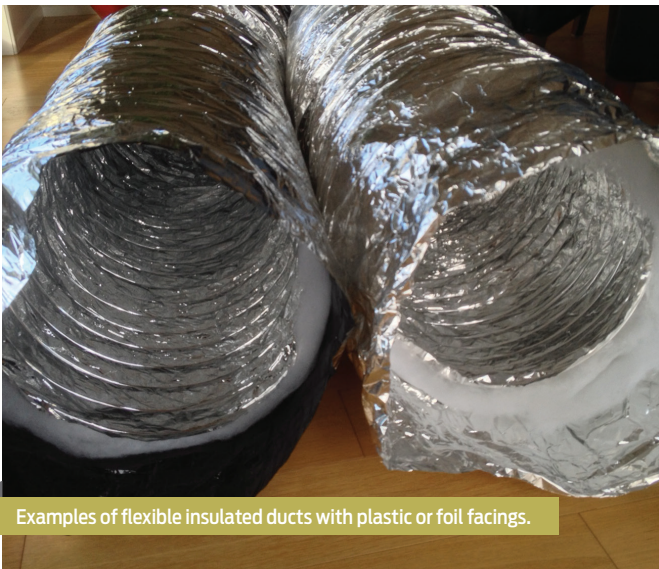


Fire behaviour of ducts

BRANZ recently investigated the fire performance of HVAC ducting and pipe insulation, reviewing the fire test methods that evaluate how they perform in a fire.



Examples of flexible insulated ducts with plastic or foil facings.

BUILDING CODE requirements for assessing the fire properties of walls, ceilings, floor coverings and duct materials changed in April 2012.

A new classification system using group numbers for reaction to fire was introduced, with further changes that affected HVAC ducting made in December 2013. These allowed the fire test in AS/NZS 1530.3:1999 *Methods for fire tests on building materials, components and structures* to be used for ductwork materials.

Ductwork fire tested

The investigation included an experimental programme exposing ductwork installed in a small room to fire. The duct materials were exposed to a gas burner to determine how the ducting performed when exposed to a fire of a size similar to a burning wastepaper basket.

Flexible ducting is commonly used to connect air diffuser outlets to rigid ductwork in HVAC systems. It is typically limited in length, circular in cross-section and consists of an uninsulated sleeve or a sandwich construction with an inner lining, core insulation and an outer sleeve.

Sleeves are plastic or aluminium foil, and the insulation material is usually a lofted polyester.

Combustible insulation spread fire

This type of flexible ducting was found to readily ignite with a moderate flaming fire and burn quickly. Thin plastic facings burn through, with the polyester insulation melting and dripping to surfaces below. As the ducts melted and collapsed, they did not easily spread fire along the length of the duct, helping to limit the total size of the fire.

Combustible polyester insulation fitted inside a rigid steel duct was also included in the test programme and performed poorly. The steel duct construction resisted collapse but allowed the burning insulation to spread fire more easily inside the ductwork, eventually resulting in a bigger fire.