INFORMATION SHEET
FIRE

WALLS AND CEILINGS
ALTERNATIVE SOLUTION

The information provided below has been taken from the New Zealand Timber Design Guide 2007, published by the Timber Industry Federation and edited by Professor A H Buchanan. To purchase a copy of the Timber Design Guide, visit www.nztif.co.nz

The AS 1530 Part 3 fire test provides indices that allow products to be ranked, however it does not provide engineering data that can be used in design nor are the results well correlated to fire behaviour in actual buildings.

Alternative approaches with a better scientific basis for assessing fire hazard of wall and ceiling linings are also available, including test methods and assessment procedures using a full-scale room-corner fire test and the small-scale cone calorimeter method.

For example, full-scale assessment of the fire performance of room linings can be based on the time-to-flashover in the ISO 9705 room-corner fire test.

This method is currently used in the Building Code of Australia for determining the fire properties of wall and ceiling linings, instead of the indices from the AS1530 Part 3.

The test involves installing the material of interest as a wall and ceiling lining in a room measuring 3.6 m long x 2.4 m wide and 2.4 m high with a 2 x 0.8 m opening in one of the short walls.

The material is exposed to flame inpingement from a propane gas burner positioned in the corner of the room.

The burner provides 100 kW for a period of 10 minutes and then 300 kW for a further 10 minutes (if required).

The combustion products are collected in a hood after they spill from the opening and a gas analyser is used to measure the oxygen concentration in the gases which can then be used to estimate the rate of heat release from the fire including both contributions from the gas burner and from the surface lining products.

The time taken for the fire to 'flashover' is a good indicator or hazard. The gas burner on its own does not produce enough energy to cause flashover, but can in combination with combustible linings.

It takes about 1 MW to produce flashover in this room. The classification system based on this approach groups surface lining materials into one of four groups.

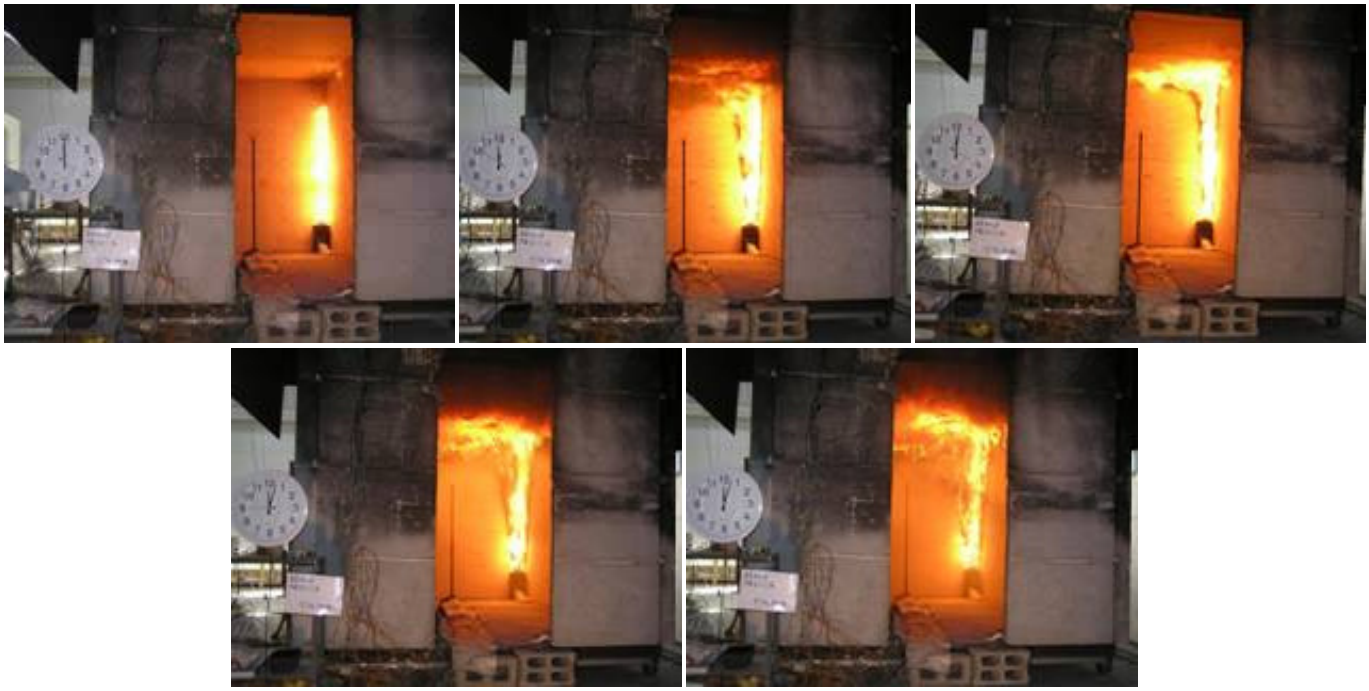
At the current time, use of results from either the room-corner or the cone calorimeter would need to be considered as an "alternative solution" for the purpose of Building Code compliance. Untreated wood products typically result in flashover after about 3-6 minutes.

The performance in the ISO 9705 room corner test can be predicted for timber and many other products using rate of heat release results from the bench-scale cone calorimeter test.

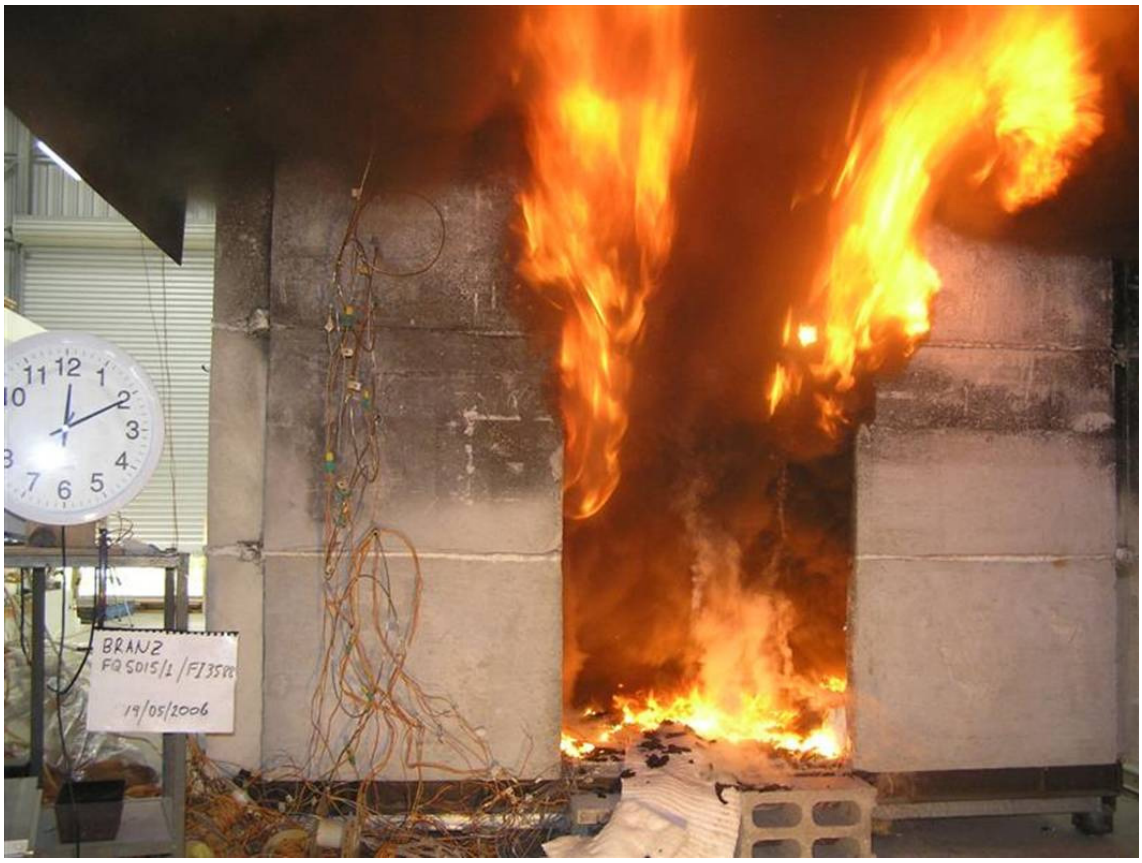
In this case product samples measuring only 100 mm x 100 mm square can be used saving both time and cost.

An electrically heated cone is used to exposed the sample to a uniform radiant heat flux of 50 kW/m2 and measurements are taken of time to ignition, mass loss rate and rate of heat release release.

These are used in a correlation to determine which Classification Group the material belongs to.



ISO 9705 room corner test in progress with plywood wall and ceiling linings
Source: BRANZ



After flashover in the ISO 9705 room corner test of plywood wall and ceiling linings
Source: BRANZ