6.1.1 AUSTRLAIA AND NEW ZEALAND

The Australian National Construction Code[75, 76] does not state any requirements other than non-combustibility. Residential or public assembly buildings of 2 stories or more and all other classes of buildings of 3 stories or more are not permitted to have combustible external walls. In practice, combustible external wall assemblies are often used for buildings greater than 3 stories via performance based fire engineered alternative solutions. However the lack of any full-scale façade testing in this country sometimes results in fire engineers and certifiers accepting materials based on very limited small scale tests (and in some cases qualitative risk assessment with no tests at all).

The New Zealand building code[77] regulates external wall assemblies based on peak HRR and total heat released in cone calorimeter testing. Alternatively compliance with NFPA 285 or "other full-scale façade tests" may be used. These requirements generally apply to buildings greater than 7 m high or less than 1 m from a relevant boundary. If buildings are less than 25 m high and sprinkler protected then there are no requirements for combustible exterior wall materials.

7.4.1 COMBUSTABILITY TESTS

Combustibility tests are essentially used to determine if materials are combustible or non-combustible. Various standard test methods exist around the world including (ISO 1182, BS 476 part 4, ASTM E136, ASTM E2652, AS 1530.1)[123-127] however they are all fairly similar.

Small specimens are exposed to high temperatures of typically 750 °C or 835 °C within a small conical tube furnace. Criteria for non-combustibility are typically.

- No sustained flaming (typically > 5 s)
- Mean furnace temperature rise must not typically exceed 50 °C
- Mean specimen surface temperature must not typically exceed 50 °C
- Criteria for limited specimen mass loss may also be applied.

Many building codes around the world deem materials such as gypsum plaster to be non-combustible as they don't necessarily meet the above test criteria for items such as mass loss.

External wall assemblies constructed entirely of non-combustible materials do not generally pose any hazard relating to fire spread.

6.1.2 UK

The UK Building Regulations and Approved Document B[78] requires either compliance with BRE Report BR135 using full scale façade tests BS8414 part 1[79] or part 2[80], or requires materials to be non-combustible or limited combustibility materials based on either BS 476 part 6[81] and part 11[82] tests or Eurocode classification[83] (Class B-s3,d2 or better). These requirements apply to buildings 18 m or more high or less than 1 m from a relevant boundary.

However often in the UK insurers require compliance with Loss Prevention Standard LPS 1181 Part 4[84] which requires compliance with BRE Report BR135 and full-scale testing to BS 8414 (which eliminates acceptance on small scale tests alone). This LPS standard also requires cone calorimeter testing on combustible components for quality control.