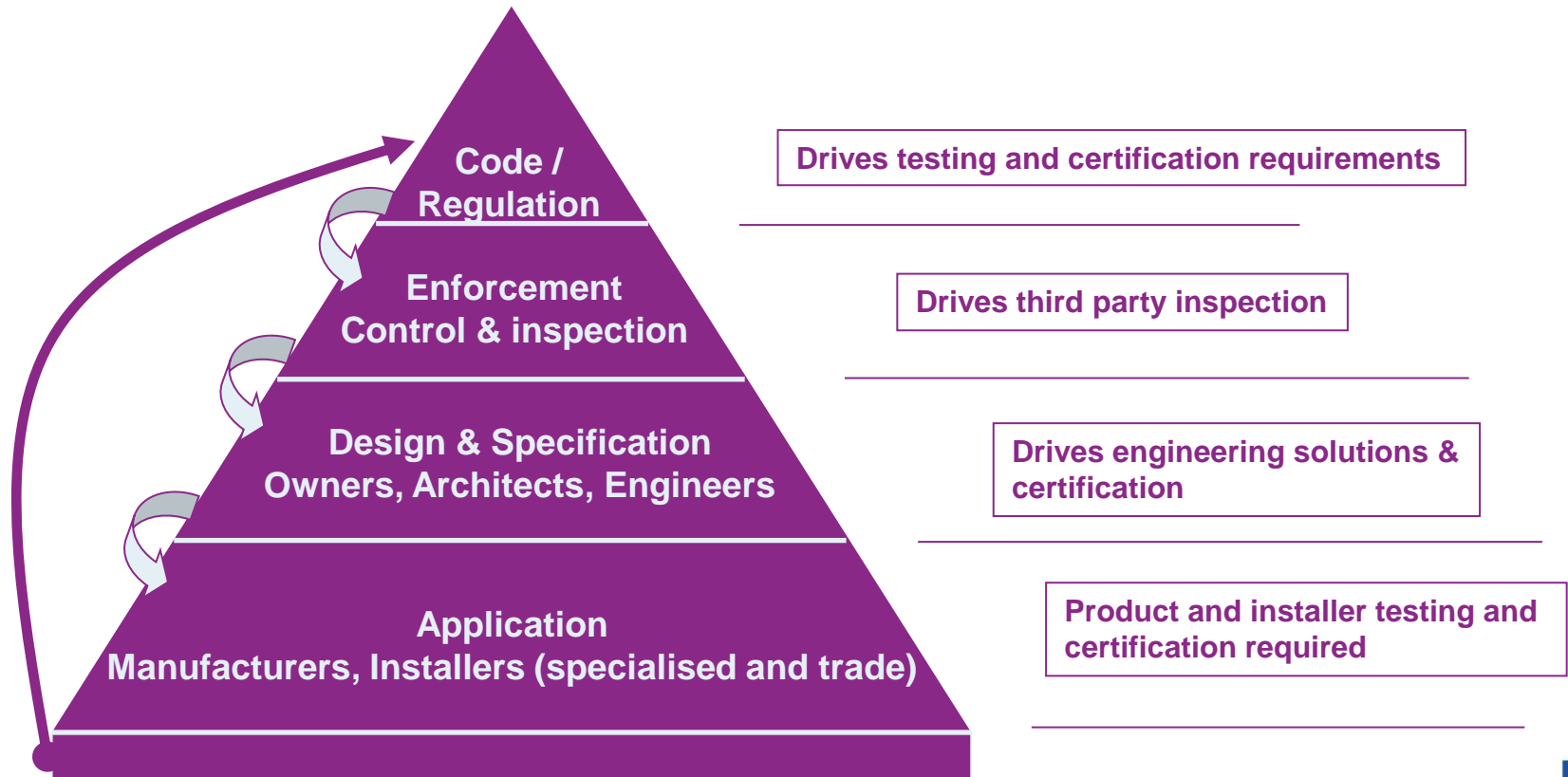


A Testing labs view: Conforming to standard

Dr Janet Murrell – Technical Manager

Fire Safety - Influence



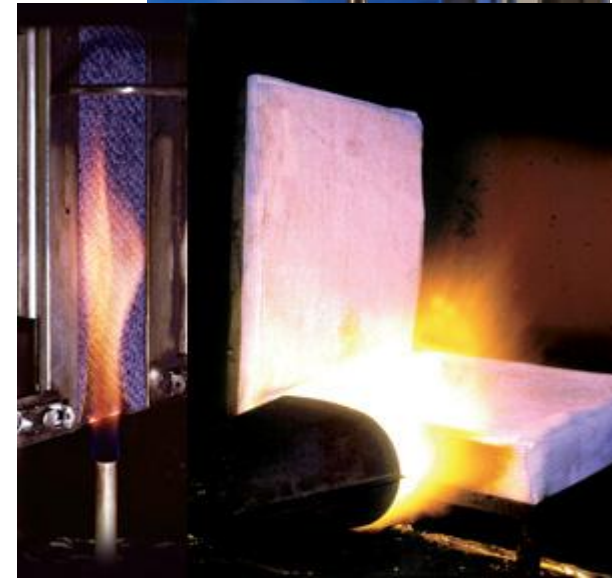


Textiles and textile composites

- Textiles have many different applications and are not only used for clothing and décor, e.g. curtains, seat and cushion covers, wallcoverings, carpets and stretched ceilings
- They can be used in passive fire protection, as smoke curtains and even, with the addition of a water supply, to provide fire containment.
- Modern textiles can be used to protect human skin from heat and flames, and are formed into fire blankets to help extinguish fires.
- Geotextiles provide us with the means to combat coastal erosion, reinforce soil, provide bank protection on waterways etc among other things
- And more recently they form the base, embedded within resins for a wide range of light weight composites (FRP's) with far reaching end uses particularly in the transport area. .

Testing

Due to the multiplicity of end uses, on a global scale, there are hundreds of different test methods for textiles and textile composites



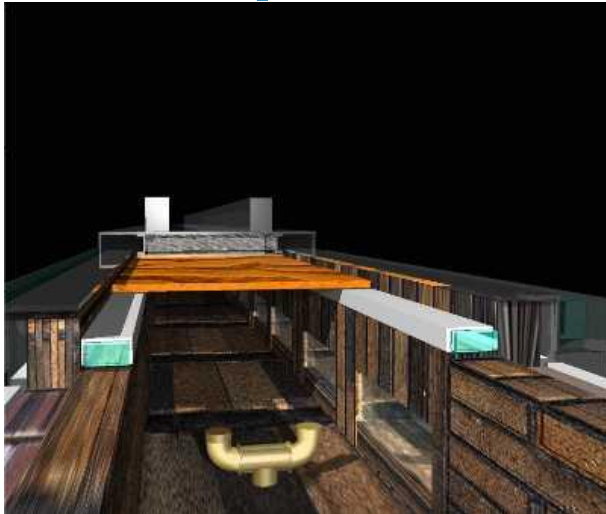
Testing – Construction

Statutory fire regulations based on centuries of differing experience with fires in the buildings sector have led to well established comprehensive regulations in many countries. However the way in which building materials are classified in respect to their fire performance is dependant upon the safety concepts of the region / country. This leads to a huge number of different test methods

- Harmonised European regulations
- National regulations within Europe
- Asian regulations
- Middle East regulations
- Australasian regulations
- American regulations
- Canadian regulations



Wallcoverings, carpets, stretched ceilings/ canopies etc



Soft furnishings

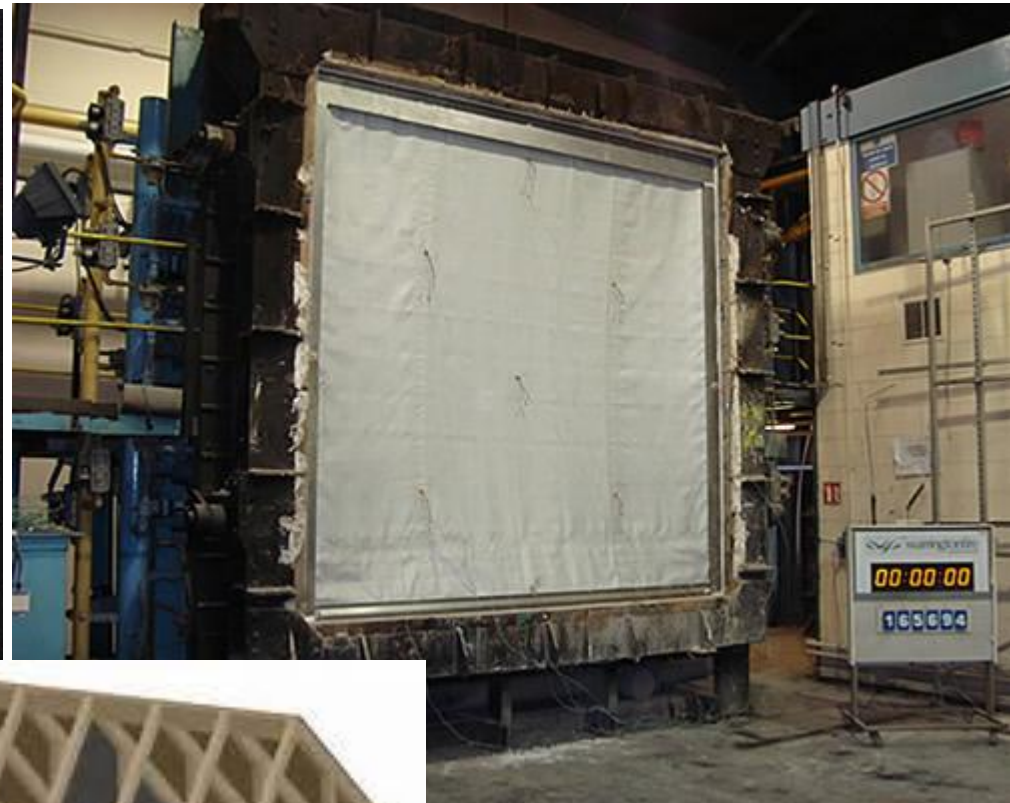
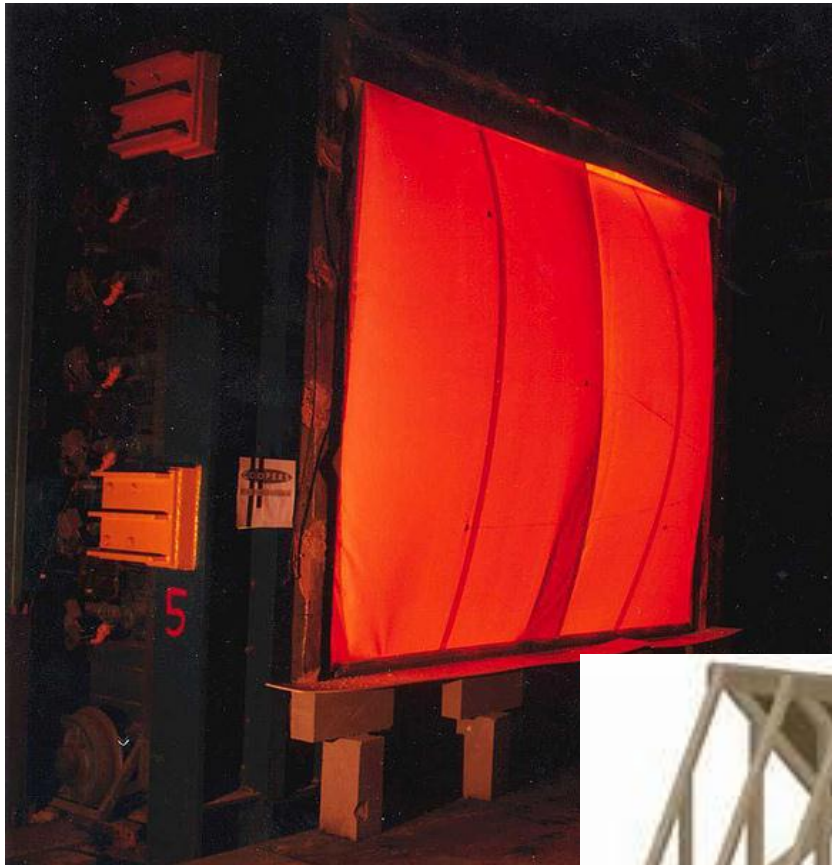
In Europe EN 13773 allows the classification of curtains (5 classes). The curtains are tested to EN 1101 (ignitability), EN 1102 (flame spread) and (EN 13772) behaviour under radiant heat. Each country has their own methods however all are based on pinning fabric to a frame and exposing it to a small flame.



Furniture



Passive fire protection



Protective clothing



Geotextiles

- **Geotextiles** are permeable [fabrics](#) which, when used in association with [soil](#), have the ability to separate, filter, reinforce, protect, or drain. Typically made from [polypropylene](#) or [polyester](#), geotextile fabrics come in three basic forms: woven (looks like mail bag sacking), needle punched (looks like [felt](#)), or heat bonded (looks like ironed felt).
- **Geotextile composites** have been introduced and products such as [geogrids](#) and meshes have been developed. Overall, these materials are referred to as [geosynthetics](#) and each configuration—[geonets](#), geogrids and others—can yield benefits in [geotechnical](#) and [environmental engineering](#) design.

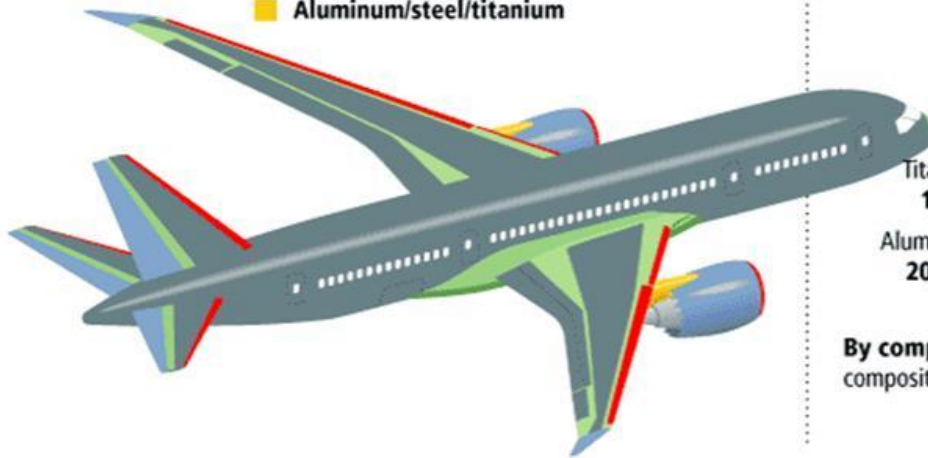
Geotextiles



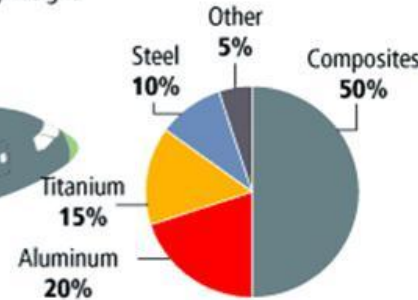
Fibre Reinforced Plastics

Materials used in 787 body

- Fiberglass
- Aluminum
- Carbon laminate composite
- Carbon sandwich composite
- Aluminum/steel/titanium



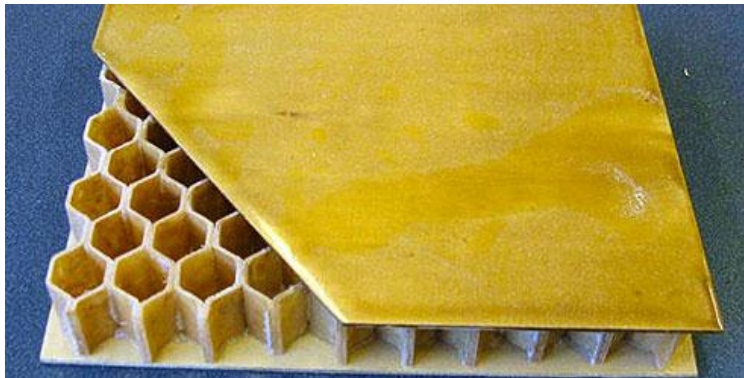
Total materials used
By weight



By comparison, the 777 uses 12 percent composites and 50 percent aluminum.



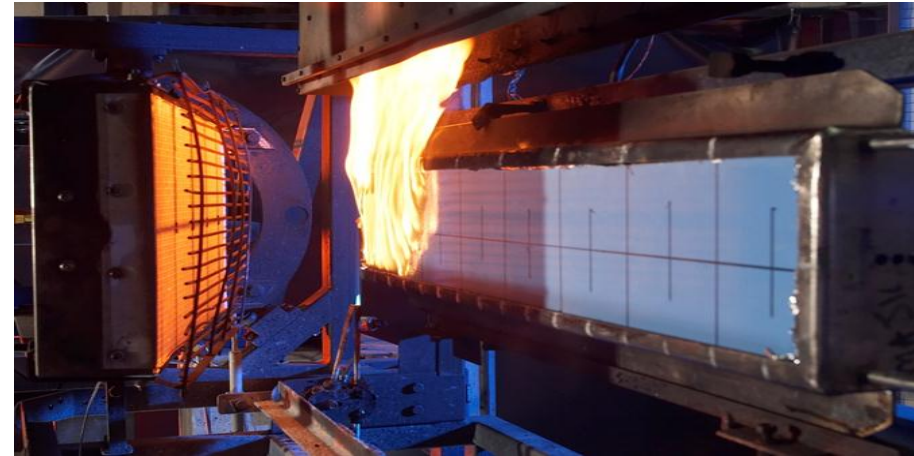
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Fire tests for FRPs

IMO and Railways Surface test

Buildings
SBI test



Aircraft Burn through test



Multiplicity of Requirements

In conclusion

- >There are more applications than ever before for textiles in both buildings and transport.
- >These means that even if sold in just one country there can be a great number of test methods even just to evaluate fire let alone any other characteristic
- >If sold in multiple countries then the number of tests required increases dramatically. This has been rationalised in some areas – marine and aircraft are global, railways and construction are pan European but not in others such as building contents.

And finally....

- The lecture today has been just a brief overview, the most powerful driver for the use of fire test methods is legislation and specification. For textiles in their end-uses legislation is increasingly being introduced across the world.
- Where these form a barrier to trade, there is incentive to rationalise the number of tests, otherwise a multiplicity of methods will survive across the world.

Thank you