

# INFORMATION SHEET

## FIRE

### FIRE DEVELOPMENT IN BUILDINGS

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](http://www.nztif.co.nz)

The insulating properties of timber can provide built-in fire resistance. Large timber members burn slowly, and form char on the surface.

Even though wood does burn, the contribution from the timber building materials to the fire load is usually small compared with the contribution of the building contents which constitute the main source of fuel.

However, large areas of wood-based surface linings in buildings can contribute to faster fire spread and this needs to be taken into account as other building design features may be required to mitigate the effects.

Design of buildings for fire safety is a complex topic requiring integration of a large number of sometimes conflicting requirements.

The immediate threat to life safety usually occurs in the early stages of a fire when occupants are likely to be trapped or overcome by smoke.

Fire resistance is required at later stages in the fire to prevent fire spread or structural collapse which could threaten the occupants or property in adjacent areas.

The severity of a fire and speed of fire growth are influenced by the design of the building.

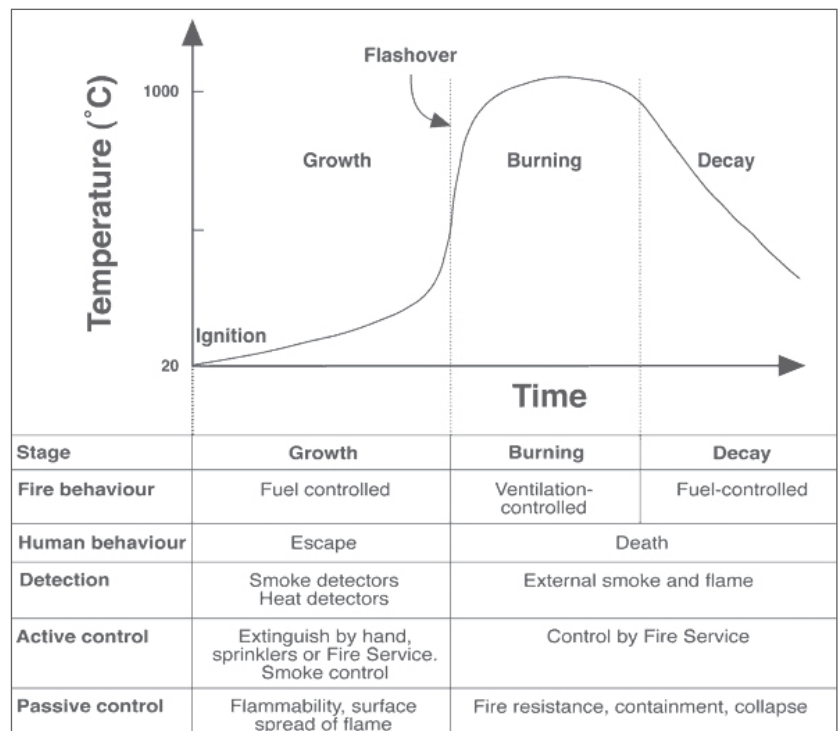
Features such as the size of the space and the available ventilation will impact on the rate of fire development.

The diagram below shows the time temperature curve for the hot gases from a typical fire in a room with no fire-fighting intervention.

Design for fire safety should include detection and control of fires at the earliest possible time, while also mitigating against the possibility of the fire getting out of control.



**Fire in room at flashover**  
Source: AH Buchanan



#### Stages of fire development

Source: Buchanan, AH (editor), 2001. *Fire Engineering Design Guide*. Centre for Advanced Engineering, University of Canterbury.