

3.1 Initiation of the fire event

This type of fire event can be initiated from a fire occurring inside the building, or by an external fire in close proximity to the building envelope, such as fires involving general waste, or resulting from malicious firesetting.

3.2 Fire breakout

Following the initiation of a fire inside the building, if no intervention occurs, the fire may develop to flashover and break out from the room of origin through a window opening or doorway (Figure 4). Flames breaking out of a building from a post-flashover fire will typically extend 2 m above the top of the opening prior to any involvement of the external face, and this is therefore independent of the material used to construct the outer face of the building envelope (eg Figures 4 and 5).

3.3 Interaction with the external envelope

It is at this stage of the fire scenario that the fire performance of the complete external cladding system, including any fire barriers, is critically important. Once flames begin to impinge upon the external fabric of the building, from either an *internal* or an *external source*, there is the potential for the external cladding system to become involved, and to contribute to the external fire spread up the building by the following routes.

3.3.1 Surface propagation

The reaction to fire characteristics of the materials used within the external cladding system will influence the rate of fire spread up the building envelope by way of the surface of the external cladding system.

3.3.2 Cavities

Cavities may be incorporated within an external cladding system, or may be formed by the delamination or



Figure 5: Fire damage

differential movement of the system in a fire. If flames become confined or restricted by entering cavities within the external cladding system, they will become elongated as they seek oxygen and fuel to support the combustion process. This process can lead to flame extension of five to ten times that of the original flame lengths, regardless of the materials used to line the cavities. This may enable fire to spread rapidly, unseen, through the external cladding system, if appropriate fire barriers have not been provided (Figure 6).



Figure 4: (a) Fire breakout from a post-flashover room on a masonry facade, (b) result of the flashover