David Sugden, Chairman of the Passive Fire Protection Federation (PFPF), explains how to avoid compromising fire protection when refurbishing and improving the home.

Built-in Fire Protection in the home

All new buildings, including houses, are governed by strict building regulations. Plans must be submitted and fire safety considered at this stage. Structural steel must be fire-resistant and compartmentation (the ability to close off areas of the building to contain fire and smoke) must be maintained. But although regulations also cover major refurbishment (especially leading to change of use), many other improvements and general DIY aren't included, and this can compromise fire safety.

Built-in or 'passive' fire protection (PFP) is the unknown – but essential - element of the fire protection industry. Ask any property owner or occupier about fire safety provisions and they will answer with smoke alarms, or possibly sprinklers and extinguishers. Because the built-in protection is just that, built-in, most people have no idea it exists. It isn't visible or tangible in the same way as a smoke alarm. But it is probably even more important. Of course smoke alarms are a very useful tool and have saved many lives, but being alerted to fire and then being unable to get out of the home safely is a horrific prospect. Built in fire protection exists to confine fire to its point of origin, making it safe for the occupants to leave the building, and safe for fire-fighters to get in, fight the fire and get out.

How does it work?

Built-in fire protection works by preventing the spread of flames and smoke from the original fire. **Compartmentation (providing fire separation and isolation) and protected escape are vital.** The elements of a fire-protection compartment are walls, partitions (especially glazed partitions) ceilings, floors, beams and columns, doors and windows. Each of these can be given a rating based on how long it can continue to function in case of fire so, for example, beams supporting a ceiling can be expected to resist collapse, and fire-doors to hold back smoke, flames and heat for a set amount of time.

Apartments and shared houses must have protected escape routes in areas of common use. This applies to escape corridors, stairs and lobbies and involves fire protection partitions and fire doors in the main.

What can be done?

In refurbishment or improvement the choice of materials used for walls and ceilings can significantly affect the speed at which fire can spread. Plastic based and synthetic products, unless certified as Fire Resistant, can burn more quickly and fiercely than traditional building products.

It's important to make sure that smoke and fire cannot spread unnoticed within concealed spaces such as gaps between ceiling and floors. Such spaces should be sub-divided, with barriers at the edges of cavities and around openings such as windows and doors.

A common mistake is installing recessed lighting without ensuring the light fitting design has the appropriate fire performance. Fitting recessed lights into ceilings forming part of a fire resistant floor requires the cutting of a hole which could allow smoke to spread. The heat generated by such lights in a confined space can build up to a dangerous level if the correct cover for the light is not in place in the cavity. If the lights are fitted in an upstairs room they should be kept clear of loft insulation.

Running new cable or pipe-work means making openings in the fire-resisting element. They must be closed with a fire and smoke resistant sealant.

In semi-detached or terraced houses the roof space must be separated from adjoining properties by a fire resistant construction which is impervious to smoke penetration. In modern properties this doesn't present a problem but older houses, built before fire safety standards were imposed, are often inadequately protected from fire in neighbouring homes. Check there is nowhere for smoke to leak through.

Glazing and garages

It's worth noting that standard window glass (used in doors, windows and partitions) has **no** significant fire resistance. Where protected escape or compartmentation has to be secured, fire-resistant glass (eg wired glass or one of the types of special clear glass now available) should be used.

If there's a garage accessible from the house legislation **requires** a 30 minute fire door to be installed, with fire and smoke seals around the edges and appropriate door furniture. Remember all doors can go some way to holding back a fire, and a fire-door can buy a considerable period in which to escape. But if the door is wedged open it's just a hole in the wall, creating a draught and spreading fire and smoke.

Help is available

A word of warning; there are no simple solutions to fire safety problems. Proper safeguards and solutions to any fire safety problem depend upon attention to detail.

The Passive Fire Protection Federation offers guidance and advice via its website www.pfpf.org

The Approved Document B, Fire Safety, Volume 1, Dwelling Houses, to the Building Regulations 2000, also offers advice and guidance on important aspects of fire safety in domestic dwellings: www.planningportal.gov.uk/uploads/**b**r/**B**R_PDF_AD**B**_2000.pdf

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