

# Slating & Tiling

## TIPS 46

### fire in domestic roofs

This may seem obvious, but roofs and fire don't mix, and should be kept as far away from each other as possible.

The 1666 Great Fire of London, which started in Pudding Lane and spread across London from thatched roof to thatched roof, is testament to what can happen if the two meet. Thankfully the introduction of the London Building Byelaws and the Building Regulations have reduced the incidence of fires spreading through towns and cities, and from roof to roof. But with the number of roof fires getting lower, we are now getting complacent and leaving out some basic fire precautions.

#### Types

There are three generic fire threats to a roof:

- a fire that starts in the rooms below the roof and spreads up into the roof
- a fire that starts in the roof and spreads to other roofs
- a fire that starts outside the roof and finds a way into the roof

#### Room fire

A fire that starts in the rooms below the roof can spread up into the roof void via holes through the plasterboard ceiling such as light fittings, pipes and ducts and the loft hatch. Fire can also spread up the outside of a building by melting or blowing out a window frame, and spreading up the external wall surface, then up through the soffit board. In the past, soffit boards were often fire resistant asbestos cement, but since asbestos has become a controlled substance, upvc with ventilation slots have become more popular. Any timber or plastic material, and any form of ventilation grill or slot in the soffit, will allow fire to spread up into the roof. It is almost impossible to allow air into the roof without letting fire in as well.

#### Roof fire

A fire that starts in the roof (caused by faulty electrics, a careless plumber soldering a pipe, or an owner using a candle to see into the loft) can spread relatively

quickly. The majority of underlay materials are combustible, and many insulation materials are not fire resistant – often containing fire retardant chemicals to suppress the effects of fire (materials like glass-fibre will shrivel up into a gooey mess). The most readily available non-combustible insulation is rock wool.

Timber trussed rafters, unlike old roof timbers, are so slender that they can burn through, rather than char on the outside leaving a core of timber unaffected. Trussed rafter plates that hold the timbers together can also be affected by fire, resulting in a possible premature collapse of the roof structure. Once the timber roof structure collapses the total weight of the roof structure and roof covering can fall down through the ceiling and spread into the rooms below.

#### Adjacent property fire

A fire that starts in an adjacent property can spread through the batten cavity, through a parapet wall gutter framing, or through an eaves soffit box. Generally these areas are not adequately protected. If the fire is above the roof and drops onto the roof, most roof coverings, being clay, concrete or slate are incombustible and will resist the fire. However, large gaps between the tiles or slates can allow flames to penetrate the roof covering and set light to the battens and underlay. Also, plastic ventilation tiles and fittings can melt leaving an opening that will allow the fire to penetrate the roof covering.

Why do we have fewer roof fires now? The answer is that we have better safety standards regarding the causes of fire. There are fewer open fires to heat buildings, better working practices for plumbing and electrics, fewer people smoking inside buildings and fewer products containing volatile chemicals. By preventing more fires, fewer spread into the roof. But when a fire does start, the roof is possibly more vulnerable than ever before.

During a roof fire the fire brigade will spray lots of water onto the affected section of roof to

quench the fire and onto the adjacent roofs to stop the spread of the fire. In many instances this practice is very effective. However, where water is poured onto materials that are hot, the sudden quenching of the heat can result in micro-cracking of the material. While visually the tiles or slates may look as if they are suitable for reuse, often they can be badly affected by frost and disintegrate within a few years. It is not advisable to reuse salvaged tiles from the area affected by fire, but if the underlay is intact the temperature in that area is unlikely to have been high enough to have affected the tiles or slates.

#### Prevention

What can the roofing industry do? Looking at the list of ways fire can spread into a roof, the majority of solutions are specification related, not roofing related.

- The roof structure itself could be non-combustible, such as steel.
- The insulation should be non-combustible such as rock wool.
- All apertures through the ceiling should be sealed with non-combustible material or be manufactured from fire and heat resistant materials.
- All soffit material should be fire resistant, such as fibre cement or metal.
- At party walls, rock wool fire-stopping should be installed between the battens and in the

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soffit box and under parapet walls where specified.

- Ventilation tiles and other penetrations through the tiles or slates should be kept to a minimum.
- Gapping between the tiles and slates should be kept to a minimum.
- All heat and flame producing equipment and tools on a roof should be kept under strict control.

While we have the Building Regulation Part B Fire, and British Standards 476 parts 3, 4, 6 and 7 that provide some guidance and test methods, there is much that should be done to improve our roofs from the spread of fire. Where fire is concerned, prevention is always better a cure. A building constructed from 100% non-combustible materials would be the ideal solution. But in the present climate this is not economically achievable. ■

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