Hot Stuff

October 2013 updated November 2015

How to ensure you are complying with regulations for external spread of flame when installing in-roof solar panels.

Your neighbours' house is on fire. As the flames lick away at your roof you're probably hoping that yours doesn't catch fire too. Approved Document B from the Building Regulations (England and Wales) aims to reduce the risk of this happening by regulating where different building materials are used.

Approaches to Roof Integration

There are three types of in-roof solar panel installation, with the roof build-up for each shown in the adjacent pictures.

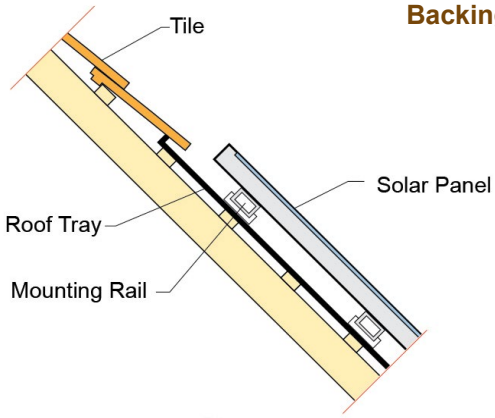
- **Interchangeable Modules Over Backing Tray**
  A roof tray made from a plastic or metal sheet is laid down over the tile battens. Brackets are fixed through the roof tray onto battens and the solar panels fixed to these brackets. If such a system relies on the solar panel for its fire rating, then the rating only applies with the panel with which it was tested. Additional measures (for example fire proof barriers behind) are required if used with a different solar panel.

- **Roof Integrated Solar Panels with Dedicated Flashing Kit**
  The solar panel itself forms the weatherproof layer, and sits directly on the tile battens fixed to the roof structure below. A flashing kit joins the edge of the panels to the surrounding roof covering.

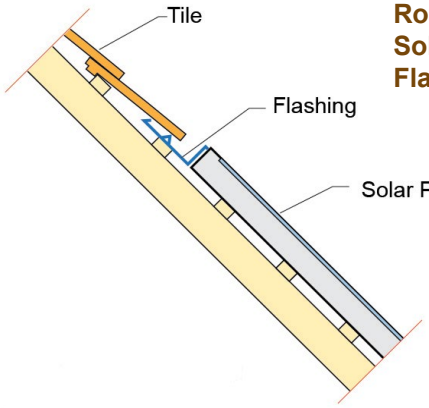
- **Tile Format Solar Panels**
  The solar panel is formed in a shape that fits in with the bonding of the tiles on the roof.

All three of these formats replace large areas of the conventional roof covering and so fall under the Building Regulations on external spread of flame.

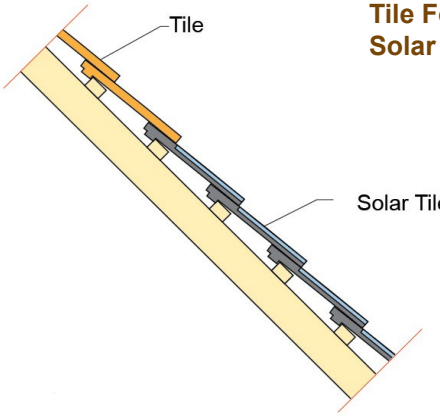
Backing Tray



Roof Integrated Solar Panel with Flashing Kit



Tile Format Solar Panels



How to Ensure You Comply

The solar panel and roofing kit must be tested and classified using methods described in BS 476-3:2004 or DD ENV 1187:2002 T4.

To perform the test, a roof sample is built up with the solar kit and surrounding tiles. Gas burners heat the surface and a fan pulls a negative pressure on the rear of the roof sample. A series of tests is performed with

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Table 5 Limitations of Roof Coverings

Designation of Roof Covering		Minimum distance from any point on relevant boundary			
National Class	European Class	Less than 6m	At least 6m	At least 12m	At least 20m
AA, AB or AC	B_{ROOF} (t4)	●	●	●	●
BA, BB or BC	C_{ROOF} (t4)	○	●	●	●
CA, CB or CC	D_{ROOF} (t4)	○	● 1, 2	● 1	●
AD, BD or CD	E_{ROOF} (t4)	○	● 1, 2	● 1	● 1
DA, DB, DC or DD	F_{ROOF} (t4)	○	○	○	● 1, 2

● Acceptable
○ Not acceptable

NOTES

1. Not acceptable on houses in terraces of three or more houses, or houses larger than 1500m^3
2. Acceptable if solar panel kit area is smaller than 3m^2 and separated from other solar panel kits by more than 1500mm

and without a flame being applied directly to the solar roofing kit.

The first letter of the classification the product is given depends on how long it takes for a hole to appear through the roof covering. An A rating means that no hole appeared during the entire test period, with products achieving progressively lower ratings the quicker a hole is formed.

The second letter designates whether flames spread across the surface, with lower ratings for greater spread.

Table 5 from Approved Document B is reproduced at the top of the page and shows how the classification achieved might restrict the use of the in-roof solar panel system. Building regulations in Scotland and Northern Ireland follow a very similar format.

Solar panel installation kits that achieve an AA, AB or AC rating can be used anywhere on the roof and without limitation to the area covered. If a solar kit with a lower fire rating is used, then the distance of the installation from the 'relevant boundaries' of the building must exceed the distance given in the table. In some circumstances there are also limitations placed on the maximum area given over to the solar panels in any one continuous section and minimum distances between such sections.

The 'relevant boundary' is the boundary which a given wall of the building faces. The boundary is generally the site boundary, but in the case of a road, river, railway or canal forming the boundary, the centre line of this can be taken. The example below shows how the requirements apply to a solar panel installation.

In Summary

- Use an in-roof solar panel system that has been tested and has a fire classification to BS476 or DD ENV 1187 T4.
- If the system does not achieve an 'A' or 'B_{ROOF} (T4)' rating, make sure you install it the approved distance from the boundary.

Example

A developer wants to install solar panels onto a pair of semi-detached houses, bounded on three sides by other properties and the fourth by a road as shown in the diagram below.

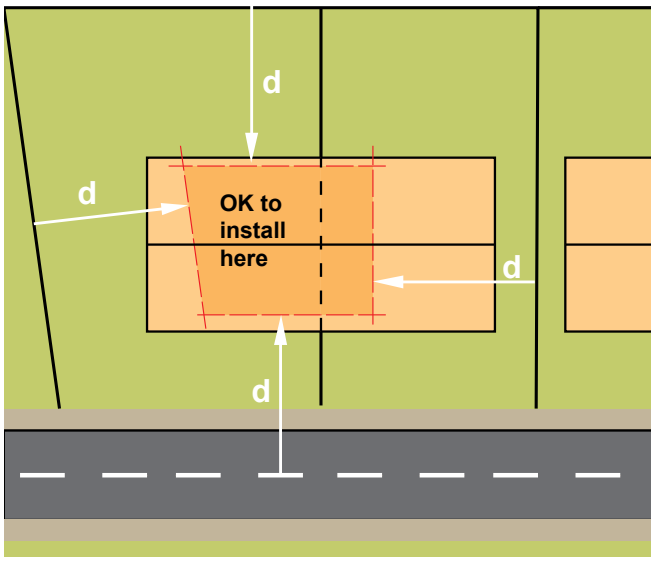
The relevant boundaries are with the adjoining properties and the centre line of the road.

1. AA, AB, AC rated solar panels - the solar panels can be installed anywhere and in any amount of roof covering.

2. BA, BB, BC rated solar panels - the panels can be installed within a bounded area with the distance d=6m.

3. CA, CB, CC, AD, BD, CD rated panels - either d=6m and the panels are installed in areas no bigger than 3m with a gap of 1.5m covered with tiles between these areas, or d=12m with no restriction on panel area.

4. DA, DB, DC, DD rated panels - d = 20m and the panels are installed in areas no bigger than 3m with a gap of 1.5m covered with tiles between areas of solar.



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