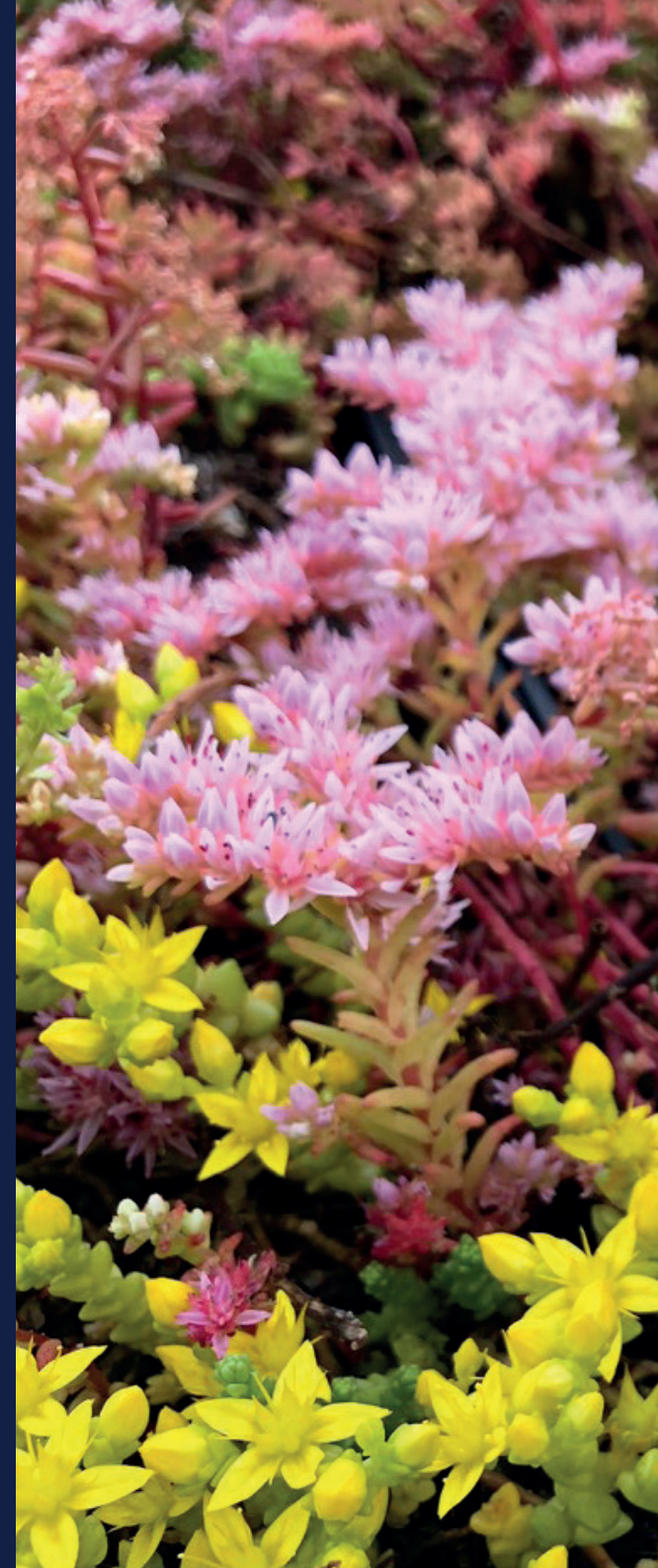




Living Roofs Fire Performance

Considerations when designing
& specifying green roofs



Designing fire-safe green roofs

Wallbarn discusses the fire performance of living roofs and compliance with regulations/ best practice guidance

Designing and specifying a green roof has, historically, involved two key considerations – the structure's loadbearing capability and the type of green roof required (intensive or extensive). Recent product developments have added the choice of traditional roll-out or more modern pre-fabricated modular solutions.

Now, however, there's an additional consideration that demands attention – fire performance. Evaluating this has become increasingly important post-Grenfell as the fire safety of buildings, their components, assembly, construction methods and management takes centre stage. Well-designed, correctly installed and maintained green roofs can resist the spread of flame.

To assist designers in achieving this the government has published two key documents – Approved Document B (ADB) and DCLG

document 'Fire Performance of Green Roofs and Walls'. Good practice supports these being considered in conjunction with the 2021 GRO Code published by the Green Roof Organisation.

Regulations

ADB is the main authority and has been updated twice post-Grenfell to reflect recommendations from the Hackitt Report. It is the basis for all fire safety compliance and actions and details the minimum legal requirements and guidance on how to meet them. The amended document states that a roof system must achieve a European classification rating of B ROOF t(4) when tested to CEN/TS 1187:2012 Test 4 Test Methods For External Fire Exposure to Roofs. The test must be carried out under BS EN 13501-5:2016 Fire classification of construction products and building elements.

By far the best way to ensure this is to have a physical fire tests of the whole roof system to

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demonstrate B ROOF t(4) is achieved. Critically, BRE test reports P110472-1001 Issue 2, P110472-1002 Issue 2 and P110472-1003 Issue 1 can no longer be relied upon to prove compliance with the legal requirements of Approved Document B. Stakeholders must demonstrate that the whole 'as installed' roof system has a valid fire certificate.

ADB states that a test report to BS EN 13501-5:2016 for the exact construction is key. So if the insulation thickness is changed, the membrane switched or the depth/elements of the substrate/growing medium altered the fire certificate may be invalid. This would mean compliance with B ROOF t(4) requiring possibly thousands of different physical fire tests to take into account the many different scenarios of a green roof build-up.

This is as much an issue for roll-out systems as modular solutions (which are supplied with all elements of a green roof contained within factory assembled trays, removing the element of installer error and creating a standardised product with no variation) because there remains the potential for insulation and membrane specifications to be changed. However, ADB offers a solution via EXAP reports.

EXAP Reports

These reports state that the test results for the product (tested in accordance with CEN/TS 1187:2012 test method 4) have an extended application (EXAP) and can be used in a larger range of applications. This extended application is carried out in conformity to CEN/TS 16459:2019

and the application document contains extrapolation rules relevant to the test method and performance of the product. In short it enables the physical test data to be used in more applications than just the physical test.

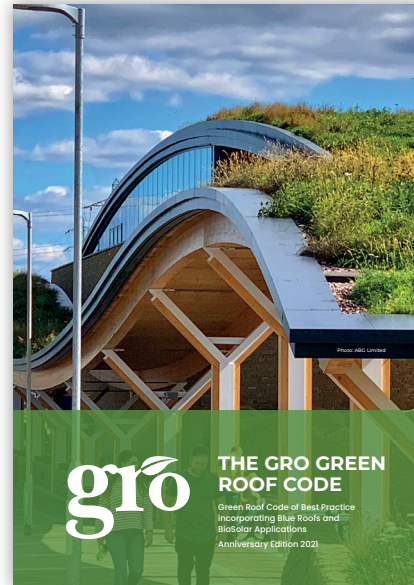
Designers should be looking for green roof systems that have passed physical fire tests of one hour, achieving B ROOF t(4) and gaining the EXAP Report, meaning their fire classification allows them to be used as part of a green roof system with a variety of membrane/insulation build-ups so long as those products also have B Roof t(4) EXAP. Furthermore, there's an additional assurance architects and specifiers can access; Approved Document B goes on to say that if the green roof build-up from the deck to the finished surface includes a minimum 80mm of substrate with less than 50% organic content then it can be assumed there will be no spread of fire.

However, this does mean that the growing medium rules need strictly adhering to. If installers – even accidentally – lay the substrate thinner than 80mm in a roll-out system it may not comply. Modular systems overcome this challenge because they are pre-filled to standardised levels, some having 100mm of super deep growing medium, with the batch-tested mix of substrate consistently applied across the many thousands of trays filled annually. GRO advises that to ensure there is no danger of fire spread or penetration the growing medium for extensive green roofs should be tested in line with BS 8616:2019 and contain no more than 20% organic content by volume (with no peat) and comply to GRO guidelines.



Conclusion

The green roof industry is forecast to continue growing apace, with increasing awareness of the impact green roofs can have on the environment by supporting biodiversity, managing storm water run-off, improving air quality, reducing the Urban Heat Island effect in towns and cities and offering sound and thermal insulation benefits. By combining advice from ADB, the DCLG's 'Fire Performance of Green Roofs and Walls' and the GRO Code designers can be assured of delivering a green roof that is fit for purpose, long-lasting and safe.



The M-Tray modular green roof system (wildflower variant) is supplied fully established in 500cm x 500cm polypropylene trays ready for instant installation.





Wallbarn is the UK's leading modular green roofing system manufacturer.

Its award-winning M-Tray* has been developed to offer green roof designers and specifiers the best of all worlds:

- **Established and flourishing at point of installation**
- **Easy and quick to specify and install**
- **On site within 24 hours**
- **Passes physical fire tests of one hour**
- **Achieves B ROOF t(4)**

To find out more or talk about fire performance
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