

Technical Bulletin 2

Flood Resilience

Flood resilience of ROCKWOOL stone wool

In tests undertaken by Glasgow Caledonian University, ROCKWOOL cavity insulation (ROCKWOOL Full Fill Cavity Batts) was undamaged by simulated flooding and insulated walls were judged to recover their thermal performance without taking longer to dry out or increasing mould risk.

Background

Flooding is a prominent - and potentially increasing - challenge in the UK. At least one in six people in England are at risk from flooding from rivers and the sea with many more at risk from surface water flooding. Our changing climate means that more homes will be at risk in the future.¹

Compounding this issue, a Met Office report demonstrates that the decade 2013-2022 was 8% wetter in terms of rainfall than the overall 1961-1990 period². Flooding and rainfall are especially pertinent in an energy-conscious world. If elements of the building fabric, such as insulation, are damaged by flooding, additional repairs may be needed to maintain the energy efficiency and thermal performance of a building.

In response to the need to better understand the impacts of flooding on insulation, Glasgow Caledonian University (GCU) has developed a robust, scientific test method sponsored by the Mineral Wool Insulation Manufacturers Association (MIMA). GCU has used this test method to assess the performance of stone wool and glass wool cavity wall insulation products following the impact of a simulated flood.

This work is important as, previously, there has been little science-based research published on what happens to mineral wool in flood conditions. Critically, as yet there are no standard test procedures in place to assess the 'flooding performance' of insulation products in general. It is hoped that this work will help inform the uptake and development of a science-based common methodology.

1. Environment Agency, 2022, Flood risk management plans 2021 to 2027: national overview (part a), <https://www.gov.uk/government/publications/flood-risk-management-plans-2021-to-2027-national-overview-part-a/national-overview-part-a>

2. Met Office, 2023: State of the UK Climate 2022, <https://rmets.onlinelibrary.wiley.com/doi/10.1002/joc.8167>

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The Tests

Insulation batts were immersed in water in a tank with clear acrylic sides, replicating a typical wall cavity. After various periods of immersion, the insulation was drained and weighed to determine the residual moisture content. Modelling to ISO 10211:2007 was used to determine how heat loss might be affected at typical wall/ground floor junctions. Modelling to EN 15026:2007 was used to investigate how drying times might be affected in a masonry wall after flood water has drained away.

Standard 'ROCKWOOL Full Fill Cavity Batts' insulation was included in the tests. A semi-rigid full fill stone wool insulation for masonry cavity wall construction, suitable for new builds or extensions. For the latter phases of GCU's research, ROCKWOOL products were sourced independently by GCU from local stockists, demonstrating the 'off-the-shelf' performance of these products.



Figure 1: ROCKWOOL Cavity insulation in a flooding test rig developed by Glasgow Caledonian University.

Results

A key finding of the GCU research, relating to ROCKWOOL Full Fill Cavity Batts, was that:

ROCKWOOL cavity insulation was not damaged by the effects of simulated flooding, nor was its presence judged to adversely affect the performance of a building once a flood had receded.

Notably, the research also concluded that the presence of ROCKWOOL insulation:

- would allow the walls of a traditional home to 'recover' their thermal performance.
- would not increase the time taken for the building to dry out.
- would not increase the risk of mould.

The report did not specifically evaluate problems caused by any pollutants, which could be carried by floodwater, such as agricultural chemicals from surrounding fields or overflow from sewers.

A copy of the full report, entitled 'Laboratory tests and modelling to investigate the effect of flooding on mineral wool cavity insulation batts in masonry walls', is freely available for download from the MIMA website:

<http://mima.info/info-centre/reports-and-publications/>

Further work is being undertaken by MIMA to help and support standards in this area.

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