

Technical Bulletin

A study to investigate the performance of ROCKWOOL stone wool insulation and its ability to naturally reduce the performance gap

Based on independently measured data from the University of Salford, ROCKWOOL concludes that when ROCKWOOL stone wool slabs are tightly joined together, the edges knit together providing a continuous insulating layer of trapped pockets of air with no gaps and no associated loss of thermal performance.

Background

With the introduction of the Future Homes Standard and low carbon heating systems, it is important that buildings are designed to maintain high standards of energy efficiency. This ensures that heat generated stays within the home during the winter, and that indoor environments remain cool and comfortable in warm weather.

The first step in achieving as-designed performance is to be certain that insulation is specified and installed correctly – including continuous jointing without gaps. Understanding the performance implications of insulation gaps is crucial, and highlights the importance of insulation materials which knit together tightly to close off gaps.

To address this challenge, ROCKWOOL has commissioned independent laboratory testing at the University of Salford to better understand and assess the performance of stone wool insulation through a series of tests and studies designed to replicate the impact of gaps in the insulation layer, and their effect on thermal performance.

Thermal Tests

University of Salford Thermal Measurement Laboratory

Ten samples of stone wool insulation of various densities were tested to ISO 8301:1991 and BS EN 12667:2001, two standards which relate to heat flow meter methods. Tests were conducted in accordance with product standard: BS EN 13162:2012+A1:2015, 'Thermal insulation products for buildings'.

Samples supplied to the University of Salford consisted of five complete slabs of ROCKWOOL stone wool insulation measuring 600x600mm, and five cut slabs each consisting of two 600x300mm pieces.

Samples were conditioned according to the requirements and measurements recorded.

A single test report was issued per test detailing the results and all relevant information including densities.

All tests conformed to the requirements of Standard Test Method ISO 8301:1991 'Heat flow meter apparatus' and BS EN 12667:2001 'Thermal performance of building materials and products.'

To discuss the content of this technical bulletin, or for any other technical enquiries, please contact the ROCKWOOL Technical Team:

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Analytical microscopy

Salford Analytical Services

A study was conducted utilising high resolution Scanning Electron Microscopy (SEM) to demonstrate the relationship between two separate stone wool insulation slabs when tightly joined together.

Various samples were supplied consisting of differing densities.

The method was designed to examine what happens to stone wool fibre structures when the edges of two separate stone wool slabs are tightly joined together, and has produced conclusive results.

The study demonstrates that as the two samples are pushed together an initial gap between the slabs is seen to close and the fibres join to form a complex and continuous network. This network is inclusive of the trapped air pockets which support stone wool insulation's thermal performance.

Results

Results from the thermal conductivity tests show that, when considering five product types over the density range 27 to 152 kg/m³, there is no loss in thermal performance between a stone wool slab and two tightly jointed pieces.

ROCKWOOL concludes that the thermal conductivity of all samples tested proved to remain within the thermal conductivities declared, irrespective of density. All declared thermal conductivities can be found in their respective Declaration of Performance available at:

<https://www.rockwool.com/group/legal-information/declaration-of-performance/>

The analytical microscopy study further proves that when two separate slabs are tightly joined together, the gap between them closes and the individual fibres knit together to form a continuous network of fibres containing trapped pockets of air.

Conclusions by ROCKWOOL have been drawn from the tests impartially and independently performed by the University of Salford, based on the samples as supplied only.

Conclusion

Based on independently measured data from the University of Salford, ROCKWOOL concludes that when ROCKWOOL stone wool slabs are tightly joined together, the edges knit together providing a continuous insulating layer of trapped pockets of air with no gaps and no associated loss of thermal performance.

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