

Position Paper

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The Durability of Mineral Wool Products

Eurima, the European Insulation Manufacturers Association (mineral wool insulation producers), finalised a European wide project to evaluate the ageing behaviour of mineral wool, which was installed in a variety of applications and building sites more than 20 years ago.

1. Historical background and Scope of the Project

With the increased demand for a higher durability for construction products and the upcoming Life Cycle Assessments of buildings a comprehensive study about the long term performance of mineral wool was requested by technical experts and by the market. The common literature usually covers the evaluations on damaged construction details and buildings, but doesn't include the assessment of properly installed systems. Eurima was asked to fill this gap and to focus on constructions with a service time of more than 20 years only.

2. Methodology of the Project

Eurima has chosen the well-respected Forschungs Institut für Wärmeschutz e.V. in Munich (FIW) for the independent evaluation of the building site, the conditions at the building site, the construction and finally the technical performance of the installed mineral wool.

A defined amount of material was retrieved from the construction and properly packed (important for the evaluation of the product humidity) under the supervision of an external institute. Parallel to the sample preparation the institute was asked to observe the conditions at the building site and to prepare the documentation. The samples were delivered to Munich, where the measurements started as fast as possible to avoid any changes in the mineral wool material. FIW focused their technical evaluation mainly on thermal performance. Other aspects like humidity and mechanical performance were evaluated as well.

3. Summary of the Results

Products of seven different buildings across Europe were evaluated for this project, which included four wall and three roof constructions. The buildings had a service time between 20 and 55 years.

The thermal conductivity measurements gave values between 32 and 38 mW/(m.K), showing that the product performance after a very long service time is still better than the original declared values.

Also the mechanical properties of the roof materials showed proper results and there was no concern about the structural integrity of the system.

One of the evaluated parameter was also the humidity content of the mineral wool and the measurements showed a moisture content well below the limit of 1,0 % by mass.

4. Conclusions

The results show that the mineral wool provides the expected high durability. The samplings also revealed fully functional constructions without insulation related defects. Some of the parameters, like thermal conductivity, were better than the expectations and declaration. The assessment of the thermal properties as a function of time gave no evidence of a decline due to ageing effects.

Construction	Product	Age (Years)	Thermal conductivity [W/(m*K)]	
			Declared value*	Measured value*
Wall, non-ventilated insulation	Sample 1	21	0.042	0.038
Flat roof, non-ventilated insulation	Sample 2	25	0.040	0.037
Flat roof, non-ventilated insulation	Sample 3	25	0.040	0.038
Ventilated façade	Sample 4	> 30	0.032	0.032
Ventilated façade	Sample 5	33	0.035	0.032

The project showed that the thermal performance of mineral wool doesn't degrade over time and the constructions deliver the expected performance even after 50 years of service, if the installation is done according to the instructions of the manufacturer.

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