

Comments on harmonised standards for thermal insulation products i.e. EN 13162...EN 13171

Note: Especially comments are prepared for EN 13162 Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification

1. Solutions needed in the short term

1.1 Declared values for thermal resistance and thermal conductivity

The rules how to determine declared values of thermal resistance and thermal conductivity should be clarified. In the Annex A it has been written correctly that it is the responsibility of the manufacturer to determine the declared values of thermal resistance and thermal conductivity. However, clause 4.2.1 and also Annex D give an other interpretation.

The declared value of thermal conductivity shall not be the calculated value $\lambda_{90/90}$ after rounding upwards to the nearest 0,001 W/(mK) using the step of 0,001 W/(m K) from ITT tests as it can be now understood from the standards.

The declared value of thermal insulation resistance shall not be the calculated value $R_{90/90}$ after rounded downwards to the nearest 0,05 m² K/W from ITT tests as it can be now understood from the standards.

The manufacturer has to determine the declared values based on evaluation of ITT test results. The declared values must be on safe side compared to the calculated $\lambda_{90/90}$ or $R_{90/90}$ values from ITT population of samples. Then in continuous factory production control the manufacturer has to show that the calculated $\lambda_{90/90}$ or $R_{90/90}$ value from FPC population are in the limit of the declared value (on the "safe" side). There should not normally be a need to declare other new declared values when mean values and variations of results are regularly calculated for FPC population according to Annex A.

1.2 Influence of air flow resistance (convection) to the thermal resistance/conductivity (only relevant for EN 13162)

It is a physical fact that convection will increase considerably the thermal resistance and decrease considerably thermal conductivity of thick insulation layers in the building envelope.

Nowadays it is not possible to take this phenomenon into account in design since CE-marking of mineral wool does not normally include information on its convection behaviour i.e. its air flow resistance. This characteristic is only declared in the CE-marking if product is used for sound insulation applications.

That is why it is necessary to add into Table ZA.1 in EN 13162 a third proxy characteristic 'air flow resistance' under the mandated characteristic 'Thermal resistance'. In this way it is possible in national rules (for the determination of design thermal resistance/conductivity from declared values) to take convection in account by using only CE-marking information as input values of the calculation.

There is no need to modify the mandate M102. TC 88 answer to the mandate just needs updating.

2. Solutions needed in the long term

2.1 Harmonised product standards for thermal insulation products taking into account the intended end use of the product

Harmonised product standards for thermal insulation products have been prepared to cover all kind of end uses. Normally the manufacturers just declare in the CE-marking that their products are intended of all applications in the building.

Unfortunately this means that the harmonised product standards for thermal insulation products do not take into account the specific regulatory needs of different end use applications of thermal insulation products.

For example thermal insulation may be fixed on the roof by using mechanical fixings. Existing harmonised product standards do not include any characteristic which could give information if the product is applicable to be used with the mechanical fixing and which kind of forces can be transferred.

Harmonised product standards should be further developed to handle the different end use applications of thermal insulation products i.e. separate Tables ZA.1 for different end-use applications are needed to the harmonised product standards.

Note: For many other construction products (See e.g. EN 12602 ‘Prefabricated reinforced components of autoclaved aerated concrete’) this kind of approach is already in use.

TC 351 has made a conclusion that before dangerous substances can be covered in harmonised product standards the intended use of the product has to be specified more accurately than nowadays in the CE-marking.

2.2 Determination of design thermal resistance or conductivity

Declared thermal resistance/conductivity values are given in the CE-marking. These declared values cannot be used in the design of structures since they do not take into account the practical and long term conditions of thermal insulation products in different end uses. Design thermal resistance/conductivity values are used in the calculation of energy efficiency of buildings.

Design thermal resistance/conductivity values are nowadays determined from declared thermal resistance/conductivity values using national calculation methods. It would be beneficial for the internal market of construction products if European guidance (e.g. EN-standard) is developed to help the Member States to give coherent rules for the determination of design values from declared values for different insulation materials.

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