

CE Mark

For technical insulation products



Content

CE marking of technical insulation products	4
• What is a harmonised EN product standard?	5
• EC Certificate of Conformity	5
• EC Declaration of Conformity	5
• Marking and labelling	5
For all applications	6
• Thermal conductivity	6
• Reaction to fire	7
• Dimensions and tolerances	8
• Dimensional stability	8
• Durability characteristics	8
For specific applications	9
• Maximum service temperature	9
• Water absorption	10
• Compressive stress	10
• Water vapour diffusion resistance	10
• Trace quantities of water soluble ions and the pH value	11
• Sound absorption	11
• Right product for your application	11

The information in this brochure describes the conditions and technical properties of the disclosed products, valid at the time of publication of this document and until replaced by the next printed or digital version. The latest version of this brochure is always available on Paroc web site.

Our information material presents applications for which the functions and technical properties of our products have been approved. However, the information does not mean a commercial guarantee, since we do not have full control of third party components used in the application or the installation.

We cannot warrant the suitability of our products if used in an area which is not provided in our information material. As a result of constant further development of our products we reserve the right to make alterations to our information material.

PAROC and red and white stripes are registered trademarks of Paroc Oy Ab.
© Paroc Group 2012.





OPTIMISED PRODUCTS

We take care of optimising,
so you can forget about compromising.

EASY DESIGN

Your design process is even smoother
due to our application-based product ranges.

PERSONAL SERVICE

Questions? We have the answers.

CE marking of technical insulation products

From August 2012, all technical insulation products must be CE marked. This means that all technical insulation products put on the market have to be CE marked. This is done according to the following harmonised product standard: EN 14303 thermal insulation products for building equipment and industrial installations – Factory made mineral wool (MW) products – Specification. When a product is CE marked, no other local product quality marks can be required on the European market. Voluntary quality marks are still allowed.

CE marking is a quality system that shows the performance of the product, not that the product is approved for a specific application. The mark shows that the product fulfils the declared properties and that it is safe to use. In all European countries, there are local regulations which define what properties a product needs in a certain application. It is important to check that the declared property fulfils the requirements for the specific application.

Product might be good as thermal insulation but has a very bad reaction to fire classification or water absorption, and if all properties are needed, you should choose a product with

declared values that meets your needs. In this brochure we explain properties that can be declared, how it is done and what is important to know when using CE marked technical insulation products.

It is the manufacturer of the product that has the responsibility to declare that every product put on the market fulfils the declared properties. The document which shows is a “Declaration of Conformity”. At Paroc we have taken this one step further and have a “Certificate of Conformity” which means that a third party surveys all products and that we at Paroc live up to what we promise.



What is a harmonised EN product standard?

All EN-standards are produced by the European Committee for Standardisation (Comité Européen de Normalisation, CEN) and all standards are approved in consensus among the member states. The members of CEN are all countries within the European Union and European Free Trade Association (EFTA).

A standard can be developed to contain a series of specifications and/or recommendations for products, systems, processes or services. A standard can also describe a measurement or test method or establish a common terminology within a specific sector.

The standard that concerns technical insulation, “EN 14303 thermal insulation products for building equipment and industrial installations - Factory made mineral wool (MW) products – Specification”, is a product standard. All European countries must accept a CE marked product to be sold on their market. From 1 June 2013, when the CPD (Construction Products Directive) is replaced with the new CPR (Construction Products Regulation), it is mandatory to adopt all ready EN standards.

The principle of the CPR is “aimed at the removal of technical barriers to trade in the field of construction products, in order to enhance their free movement in the internal market”. A CE marked product fulfils the essential requirements in the CPR, which means that it is safe for consumer, construction, and environment. The CE mark also makes the market more transparent and easier to compare different products, and the responsibility and monitoring of the properties are transferred from authorities to the market itself.

Standards are written by experts in the specific field. Experts are nominated via national standardisation bodies and can represent industry, trade associations, professional institu-

tions, government, consumer bodies, customers, certification bodies, and more. CEN together with a chosen responsible National Standards Body administrate the process.

When a product standard is approved, it is published in the Official Journal and it shall be implemented within nine months after publishing. After this a twelve-month (sometimes longer) transitional period follows where all actors can implement and adapt to the standard.

EC Certificate of Conformity

An EC Certificate of Conformity is established by a third party, a notified body. The notified body checks that the manufacturer (e.g. Paroc) fulfils the declared values for each product. The minimum requirement to include in the EC Certificate of Conformity is *reaction to fire class* and *thermal conductivity*.

Paroc has taken this one step further and has certified even more properties than required. This way it is guaranteed by a third party that we keep our promises and it is easy to see that we do so. For Paroc, Technical Research Centre of Finland (VTT) is the notified body.

EC Declaration of Conformity

The key document for CE marking is the EC Declaration of Conformity. This is the document that should always be available for you. In the declaration we as a manufacturer declare that all products conform to and fulfil what we promise. The declaration also states values for that specific product.

For all our CE marked products you will find the EC Declaration of Conformity on our website www.paroc.com

Marking and labelling

The EC Declaration of Conformity and the label on the package shall include the information of the manufacturer, the fire class and the thermal resistance or conductivity of the product. It shall also refer to which standard it has been assessed and include all other properties the manufactured needs or wants to declare. This declaration is given by a designation code on the label together with the CE-mark.

The designation code is a string of the declared properties for a product. In this, you can find what properties the manufacturer is declaring.

MW EN 14303 – T2 –
ST(+)-650 – CS(10)20 –
WS1 – MV2 – CL10 –pH9,5

The explanation of the designation code is given in the relevant product standard, in this case EN 14303. The code starts with MW which means Mineral Wool followed by the standard EN 14303. The following abbreviations in the example are explained in the following text.

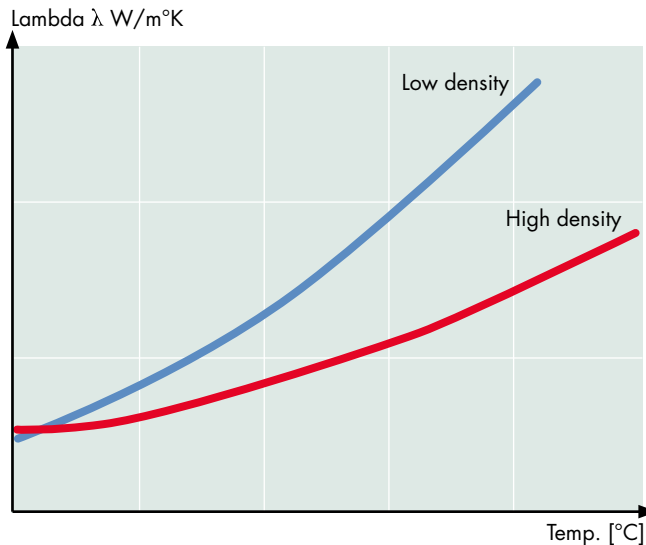
For all applications

The following properties are mandatory to declare for all technical insulation products that shall be CE marked, regardless of application.

Thermal conductivity

The thermal resistance is the property explaining how well a product resists thermal transmission through the material. This is one of the main reasons to insulate: to reduce unwanted heat losses in installation and building structures. The thermal performance of an insulation material is often given as the thermal conductivity (lambda value). The lower the lambda value is, the better the insulation.

The thermal conductivity (lambda) depends on temperature and moisture. Since lambda is dependent on temperature, it is very important to use the right product for the right application. A product with good (low) lambda value at 10°C might not have a good lambda value at 100°C.



Moisture affects the material's thermal conductivity since water has a much worse lambda value than air. See the table below.

Material	λ ₁₀ -value, W/mK
Stonewool, perpendicular to fibers	0.033 – 0.039
Stonewool, parallel to fibers	0.039 – 0.050
Wood	0.14
Carbon steel	60
Air	0.025
Water	0.6
Ice	2.3

Thermal conductivity of PAROC stone wool products do not change with time, and will keep their thermal properties throughout the lifetime of the installation.

Lambda values can be declared by the lambda-temperature curve or in a table with lambda and thermal conductivity values. The unit for thermal conductivity is W/(m x K). The value is rounded up to closest 0.001 W/(m x K). If the product has a declared *maximum service temperature*, the lambda values shall be declared up to that temperature.

Lambda values declared by Paroc are tested in accordance with the harmonised European standards EN 12667 for flat products and EN ISO 8497 for pipe sections.

Thermal conductivity is not shown in the designation code, but must be visible in the *EC Declaration of Conformity* and in the product information.

You will find these documents on our website: www.paroc.com

Reaction to fire

The reaction to fire classification describes how the product, as placed on market, contributes to fire development in the early phase of a fire. This is called Euro-class, which shall be determined in accordance with EN 13501-1. A material with a good Euroclass delays flashover as long as possible. After that, it is the fire resistance of a structure that is important (e.g. EI classification).

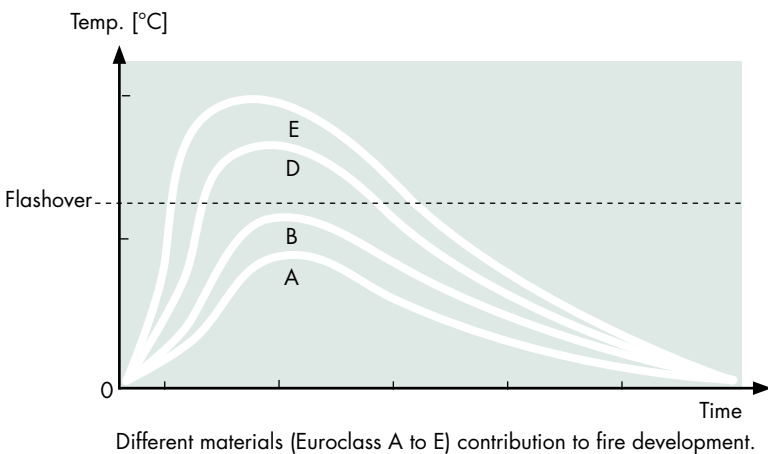
Reaction to fire is described with Euroclass A-F, with the addition of how much smoke (s1-s3) and flaming droplets (d0-d2) the product creates when exposed to fire.

Contribution to fire A - B - C - D - E - F		Smoke intensity s1 - s2 - s3	Burning droplets d0 - d1 - d2
A1	Flashover not possible	No test needed	No test needed
A2	Flashover not possible	s1 = no or very little smoke s2 = limited amount of smoke s3 = much smoke	d0 = No burning droplets
B	Flashover not possible		d1 = Droplets burn for less than 10 sec d2 = No demand
C	Flashover after more than 10 minutes		
D	Flashover between 2 and 10 minutes		
E	Flashover in less than 2 minutes	Not tested	- or d2
F	Not tested	Not tested	Not tested

Examples of Euroclass

- A2-s1, d0 (Flashover not possible, no or very little smoke, no burning droplets)
- B-s3, d1 (Flashover not possible, much smoke, droplets burn for less than 10 seconds)

For pipes the same Euroclasses are used, but with the subscript index “L” (e.g. A2_L-s1, d0).



PAROC stone wool is Euroclass A1 and does not contribute to the development of a fire. The requirement varies depending on national regulations and those vary between European countries.

PAROC stone wool reaction to fire does not change over time and gives the same top level, maintenance-free fire safety during the entire lifetime of the installations.

The Euroclass of the product is not shown in the designation code, but shall always be shown on the *EC Declaration of Conformity* and other product related information (e.g. datasheets and on the product label).



Dimensions and tolerances

In the dimension and tolerances declaration it is shown what tolerances the product has for different dimensions. The dimensions are length, width and thickness for flat products and, for slabs and boards, squareness. For pipe sections the dimensions are length, thickness, inside diameter, thickness uniformity and squareness.

Thickness tolerances are described as classes from T1 to T9 according to the table below:

Thickness tolerances		
Level or class	Tolerances	
T1	- 5 % or - 5 mm ^a	Excess permitted
T2	- 5 % or - 5 mm ^a	+ 15 % or + 15 mm ^b
T3	- 3 % or - 3 mm ^a	+ 10 % or + 10 mm ^b
T4	- 3 % or - 3 mm ^a	+ 5 % or + 5 mm ^b
T5	- 1 % or - 1 mm ^a	+ 3 mm
T8	- 5 % or - 3 mm ^a	+ 5 % or + 3 mm ^a
T9	- 6 % or - 5 mm ^a	+ 6 % or + 5 mm ^a

a whichever gives the greatest numerical tolerance.

b whichever gives the smallest numerical tolerance.

Other dimensional tolerance requirements according to EN 14303 are:

Other dimension requirements according to EN 14303						
Form of delivery	Width	Lenght	Thickness class	Inside diameter	Thickness uniformity	Squareness
Slabs/ boards	± 1,5 %	± 2%	T3 to T5			+ 5 mm/m
Lamella mats	± 5mm	+ excess - 0 mm	T4 and T5			
Wired mats	± 10 mm	+ excess - 0 mm	T2 and T3			
Batts, mats, rolls, quilts, mattress, felts ^b	± 10 mm	+ excess - 0 mm	T1 to T5			
Pipe sections D < 150 mm		± 5 mm	T8	+ 4 mm - 0 mm	Difference less than 6 mm or 10 % ^a	± 4 mm or ± 2 % of the external nominal diameter ^a
Pipe sections D ≥ 150 mm		± 5 mm	T9	+ 5 mm or + 2 % ^a - 0 mm	Difference less than 10 mm or 12 % ^a	± 4 mm or ± 2 % of the external nominal diameter ^a

a whichever gives the greatest numerical tolerance.
b T2 only.

PAROC stone wool always meets the requirements stated in the standard.

Our internal requirements are even tighter.

The thickness tolerance class of, for example, T4 is shown in the designation code like this: T4.

Dimensional stability

Dimensional stability describes how well dimensions are maintained when the product is exposed to high relative humidity for a longer time (48 hours). The change in thickness, length and width shall not exceed 1.0%. For products where *maximum service temperature* is declared, the dimensional stability is not needed since the products have been exposed to a more severe test.

Durability characteristics

Unlike some insulation material on the market, PAROC stone wool does not change with time. *Thermal conductivity, reaction to fire and dimensions* such as thickness are intact for the lifetime of the installation.



For specific applications

The properties below are mandatory to declare only when the product application requires it.

Maximum service temperature

Maximum service temperature is very important in applications where the insulation will be exposed to high temperatures, continuously or in intervals. Especially in industrial applications this is a very important property. In most cases, a high density product can withstand a higher service temperature than a low density product.

Tests shall be carried out in accordance with EN 14706 for flat products and EN 14707 for pipe sections. The product is tested under a load, and the reduction of thickness is measured after the product has been exposed to declared temperature for 72 hours. If the reduction of thickness is less than 5% and there is no evidence of self-heating, the product has passed the test. If a product is used in an application with too high maximum service temperature, there is a risk of, for example, thickness reduction, which gives a worse thermal insulation over time.

When a maximum service temperature of, for example, 680 °C for a product is declared, it is shown in the designation code like this: ST(+)/680.

Water absorption

Water absorption is a important property, since there are many applications where the insulation might be exposed to water, high humidity or other liquids, such as at building sites, as well as in case of leakages of tanks, pipes or other equipment. If the insulation absorbs water it might increase damage to the installation e.g. corrosion and also dramatically lower the insulation properties of the product (increase *thermal conductivity*). Wet insulation does not have the same *thermal conductivity* properties as declared.

If the water absorption is declared, test results cannot exceed 1.0 kg/m². Tests shall be determined in accordance with EN 1609 for flat products and EN 13472 for pipe sections. When testing, the product is placed in water for 24 hours, dried for 10 minutes and after that, the change in weight is measured (test method EN 1609 and EN 13472). PAROC stone wool does not absorb water and does not increase the risk of damage due to moisture.

When the water absorption is declared, it is shown in the designation code like this: WS1.

Compressive stress

When a mineral wool product is used in an application where it is exposed to compression e.g. tank roofs, you need to know the compressive stress capacity. The compressive stress shall be determined in accordance with EN 826. It is declared at the maximum compression of 10% and with the unit of kPa.

Paroc declares the compressive stress for special products, such as roof slabs for tanks.

An example of the compressive stress shown in the designation code: CS(10)80

(the compressive stress to deform the product 10 % of its thickness is over 80 kPa)

Water vapour diffusion resistance

Water vapour diffusion resistance is tested in accordance with EN 12086 for flat products and EN 13469 for pipe sections and declared as level MV1 or MV2.

Level	Requirement m
MV 1	100
MV 2	200

Water vapor diffusion equivalent air layer thickness

PAROC stone wool has an open cell structure and does not affect the movement of water vapour. When water vapour resistance is needed, PAROC products with AluCoat® should be used. The AluCoat® facing is class MV2 and it provides the needed vapour barrier and works very well for cold pipes or ducts or other applications where water vapour resistance is required. For these applications, all joints need to be taped with suitable aluminium tape.



Trace quantities of water soluble ions and the pH value

Test method EN 13468 is used to determine the level of ions and pH, which must be at the right level. Water soluble ions (or the wrong pH-value) can promote unwanted oxidation or corrosion. In some applications, especially in industry (e.g. at nuclear plants), this might be very important. PAROC stone wool is chemically inert and does not contribute to the oxidation process.

The ions that can be declared are water-soluble chloride (CL), fluoride (F), silicate (SI) and sodium (NA), and declared as mg/kg. For chlorides and fluorides, no test result shall exceed the declared value. For silicate and sodium, no test result shall be below the declared value. The pH-value shall

not deviate from the declared level by more than 1.0. The most important factor is the chloride value of the product, which in many industrial plants is required to be less than 10 ppm.

When trace quantities of water soluble ions, for example, chloride and the pH value are declared, it is shown in the designation code like this: CL10 or pH10.

Sound absorption

PAROC stone wool is a good sound absorption material due to its open structure. The sound absorption coefficient is tested and declared in accordance with EN ISO 354 and the sound absorption characteristics calculated according to EN ISO 11654.

Right product for your application

PAROC has a wide range of products, optimised for each specific application. Whether the requirement is for high temperature, fire, condensation or other insulation need, we have a solution. It is easy to find the right product from our application-based product ranges; PAROC Hvac, PAROC Pro and PAROC Marine.

For more information about our product range, please go to our website www.paroc.com. There you will also find contact information to our local sales representatives.



Paroc Group is one of the leading manufacturers of mineral wool insulation products and solutions in Europe. PAROC® products and solutions include building insulation, technical insulation, marine insulation, structural stone wool sandwich panels and acoustics products. Paroc has production facilities in Finland, Sweden, Lithuania and Poland, and sales and representative offices in 13 countries across Europe.



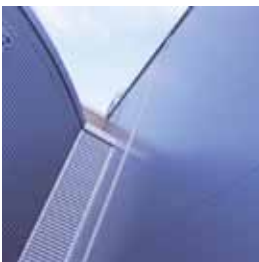
Building Insulation produces a wide range of products and solutions for all traditional building insulation. The building insulation is mainly used for thermal, fire and sound insulation of exterior walls, roofs, floors, basements, intermediate floors and partitions.



Sound absorbing ceilings and wall panels for interior acoustic control, as well as industrial noise control products, are available in the range.



Technical Insulation is used for thermal, fire and sound insulation in building techniques, industrial processes and pipe work, industrial equipment and ship structures.



PAROC® fire proof panels are lightweight steel-faced panels with a core material of stone wool. PAROC® panels are used for façades, partition walls and ceilings in public, commercial and industrial buildings.



PAROC OY AB

Technical Insulation
Läkkisepäntie 23, P.O.Box 47
FI-00621 Helsinki, Finland
Tel +358 46 876 8000
Fax +358 46 876 8002
technical.insulation@paroc.com
www.paroc.com