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Toplotnoizolacijski ognjevzdržni izdelki - 1. del: Terminologija, klasifikacija in metode za topne visokotemperaturne vlaknene izdelke

Insulating refractory products - Terminology, classification and methods of test for high temperature insulation wool products

Feuerfeste Erzeugnisse für Wärmedämmzwecke - Teil 1: Terminologie, Klassifizierung und Prüfverfahren für Erzeugnisse aus Hochtemperaturwolle zur Wärmedämmung

Produits réfractaires isolants - Terminologie, classification et méthodes d'essai pour produits à base de laine isolante à haute température

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Foreword

This document (prEN 1094-1:2008) has been prepared by Technical Committee CEN/TC 187 “Refractory products and materials”, the secretariat of which is held by BSI.

This document is currently submitted to the Unique Acceptance Procedure.

This document will supersede EN 1094-3:2003.

1 Scope

This European Standard defines terms for those refractory products and materials which are classed as high temperature insulation wools (HTIW). It also establishes the classification of insulating refractory products made from HTIW and specifies methods for determining the thickness, bulk density, resilience, permanent linear change and tensile strength of HTIW products.

It applies to HTIW bulk wool, blankets, felts, mats, boards, pre-formed shapes and papers, with the exception of products delivered in a wet state.

Further test procedures are in development and will be included once they have been ratified. These include a 3 point bend test for boards, a length weighted fibre diameter measurement technique by Scanning Electron Microscope, shot content measurement (dry and wet methods) and thermal conductivity measurement. There is a shot content method described in BS ISO 10635 and there is a thermal conductivity technique described in ASTM C201.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1094, all parts, *Insulating refractory products*

EN ISO 7500-1, *Metallic materials – Verification of static uniaxial testing machines – Part 1: Tension/compression testing machines – Verification and calibration of the force-measuring system (ISO 7500-1:2004)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 General terms and definitions

3.1.1

high temperature insulation wool

HTIW

man-made mineral wool suitable for use as heat-insulating materials above a temperature of 600°C and divided into amorphous alkaline earth silicate wools (AES), aluminosilicate wools (ASW) and the polycrystalline wools (PCW) with a classification temperature greater than 1 000 °C

3.1.2

wool

non-directional agglomeration of fibres with varying diameter and length distributions

3.1.3

fibre

particles with a length to diameter proportion of $L/D > 3:1$

3.1.4

AES-wool

amorphous wools with a typical composition range as given in Table 1

Table 1 — Typical Composition range of AES-wool

Component	Percentage by mass
CaO + MgO	18 to 43
SiO ₂	50 to 82
Al ₂ O ₃ + TiO ₂ + ZrO ₂	< 6
Other oxides	< 1

3.1.5**aluminosilicate wool****ASW**

amorphous wools, subdivided into

- a) aluminosilicate wool (Al₂O₃ + SiO₂), with a composition range as given in Table 2, and
- b) alumino zirconium silicate wool (Al₂O₃ + ZrO₂ + SiO₂), with a composition range as given in Table 3

Table 2 — Typical Composition range of aluminosilicate wool

Component	Percentage by mass
Al ₂ O ₃	46 to 56
SiO ₂	44 to 54
Other oxides	< 1

Table 3 — Typical Composition range of alumino zirconium silicate wool

Component	Percentage by mass
Al ₂ O ₃	< 37
SiO ₂	> 48
ZrO ₂	< 20
Other oxides	< 1

3.1.6**polycrystalline wool****PCW**

wool with a typical composition range as given in Table 4

Table 4 — Typical Composition range of polycrystalline wool

Component	Percentage by mass
Al ₂ O ₃	72 to 97
SiO ₂	3 to 28
Other oxides	< 0,1

3.1.7

resilience

ability of HTIW products to spring back after being compressed to 50 % of their initial thickness

3.1.8

tensile strength

apparent maximum tensile stress that the material can withstand

NOTE It is expressed in Pascals (Pa). It is given together with the bulk density determined by subclause 7.2

3.2 Materials and products made from high temperature insulation wool (HTIW)

3.2.1

bulk wool

wool in the state as produced before conversion into other products

NOTE 1 Bulk wool is available as:

- a) wool with long fibres with or without finish (lubricant);
- b) wool with chopped fibres with variable length due to their application.

NOTE 2 Lubricant is added to the fibres to keep them flexible for further processing the wool products. Typically, the wool products are thermally treated after production to remove the lubricant.

3.2.2

mat

flexible, non-needled wool without further bonding agent

3.2.3

blanket

flexible, needled mat, free of binders, with nominally determined dimensions

NOTE The mat is processed with barbed felt needles. In consequence, the product becomes denser and stronger.

3.2.4

felt

flexible, non-needled product with further bonding agents

3.2.5

module

blanket formed into thick sections either by needling, stacking or folding sheets, compressed to a higher density and typically supplied either with integral anchoring systems

NOTE Typically, the bulk density of modules is between 160 kg/m³ and 300 kg/m³. Modules can be of a complex shape.

3.2.6

paper

flexible insulating material formed on a paper-making machine

NOTE Typically, thin shaped HTIW products are kept together by an organic binder (e.g. latex).

3.2.7

board

rigid flat sheet, usually containing inorganic and/or organic binders, produced by a wet process fired or unfired