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Ships and marine technology — Performance requirements for low bio-persistence alkaline earth silicate wool

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Foreword

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 8, *Ship design*.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Mineral wools consist of glass wool, stone wool, slag wool and AES (Alkaline, Earth Silicate) fibers. This standard only covers AES fibres.

Mineral wools are used as non-combustible insulation on ships and marine projects, for thermal and acoustic insulation as well as passive fire protection in A and B class fire divisions.

Low bio-persistence (biosoluble) fibres are mineral wool fibres developed to dissolve after inhalation very quickly in the lung and do not persist and thus maximize the protection of human health.

The testing of low bio-persistence as well as the evaluation criteria exist in Europe since more than 20 years and are implemented in e.g. European legislation[1)]. Low bio-persistence mineral wools are mass-produced and easily available globally from different suppliers.

This document only applies to AES wools, whether there is a need to develop additional standards for other low bio persistent insulation wools in the future is under consideration.

1) EU Directives 67/548/EEC and 1999/45/EC and its amendments (Regulation (EC) No 1272/2008).

Ships and marine technology — Performance requirements for low bio-persistence alkaline earth silicate wool

1 Scope

This document specifies classification, performance and test method for low bio-persistence alkaline earth silicate wool (LBP-AES-wool) products for marine use.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 8302, *Thermal insulation — Determination of steady-state thermal resistance and related properties — Guarded hot plate apparatus*

ISO 10635:1999, *Refractory products — Methods of test for ceramic fibre products*

ISO 12570, *Hygrothermal performance of building materials and products — Determination of moisture content by drying at elevated temperature*

ISO 12677, *Chemical analysis of refractory products by X-ray fluorescence (XRF) — Fused cast-bead method*

ISO 22262-2, *Air quality — Bulk materials — Part 2: Quantitative determination of asbestos by gravimetric and microscopical methods*

ISO 29469, *Thermal insulating products for building applications — Determination of compression behaviour*

EN 1094-1:2008, *Insulating refractory products — Part 1: Terminology, classification and methods of test for high temperature insulation wool products*

International code for application of fire test procedures (IMO FTP code, 2010, Part 1 and Part 5), December 3, 2010, International Maritime Organization

EUR 18748 EN: 1999 *Methods for the determination of the hazardous properties for human health of man made mineral fibres* (MMMF), April 1999, European Chemicals Bureau

3 Terms and definitions

For the purposes of this document, EN 1094-1:2008 and the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
low bio-persistence alkaline earth silicate wool
LBP-AES-wool
alkaline earth silicate wool with low bio persistence fibers

EXAMPLE See Table 4 for typical composition ranges.

4 Classification

According to the morphological characteristics, LBP-AES-wool products are classified as follows:

a) bulk;

b) blanket;

c) board;

d) textile;

e) paper.

5 Performance and test

5.1 Sample preparation

Samples of LBP-AES-wool products shall be prepared in accordance with ISO 10635:1999, Clause 3 according to the test items.

5.2 Dimensions

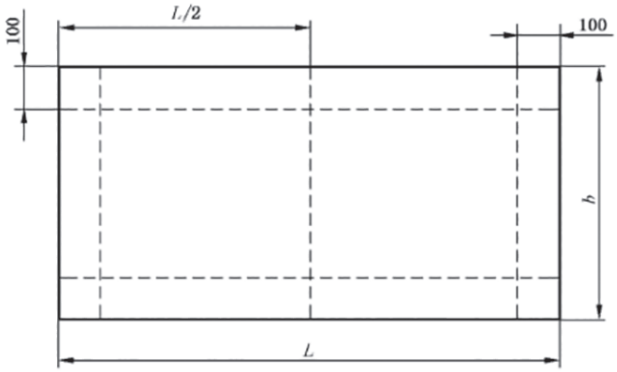
The tolerance of dimensions for LBP-AES-wool shall be specified in Table 1. The measuring method of thickness shall be according to ISO 10635-1999, Clause 4. The length and width are measured by steel tap whose accuracy is 1 mm. Measuring position see Figure 1.

Place the sample on the surface, and measure the sample by steel tap whose accuracy is 1 mm. The measuring positions are 100 mm distance to both sides which are showed as two horizontal dotted lines in Figure 1. The length of sample is determined by the mean length of these two measurements.

The measuring positions of width are 100 mm distance to both sides which are showed as two vertical dotted lines, and the dotted line in the middle of the sample. The width of the sample is determined by the mean width of these three measurements.

Table 1 — The tolerance of dimensions

Type	Allowance deviation		
	Thickness	Length	Width
blanket	±10 % of its thickness	0 mm to 50 mm	±5 mm
board	±10 % of its thickness	±3 mm	±2 mm
textile	—	0 mm to 500 mm	±5 mm
paper	±15 % of its thickness	±1 mm	±4 mm



Key

L mean length of length measured from two horizontal dotted line

b mean width of width measured from three vertical dotted line

Figure 1 — Measuring position

5.3 Thermal conductivity

The thermal conductivity coefficient for LBP-AES-wool products shall be specified in Table 2.

Table 2 — The thermal conductivity coefficient

Item		Thermal conductivity coefficient W/m•K		Test method
		Average temperature (500 ± 20) °C	Average temperature (20 ± 5) °C	
blanket	density is (≤ 100) kg/m³	≤ 0,176	≤ 0,035	ISO 8302
	density is (>100~130) kg/m³	≤ 0,156		
	density is (>130~160) kg/m³	≤ 0,153		
board	density is (200~400) kg/m³	≤ 0,153		
paper	density is (140~160) kg/m³	≤ 0,149		

5.4 Chemical composition

5.4.1 Chemical composition requirements of LBP-AES-wool products are specified in Table 3. The analysis method shall be according to ISO 12677.

Table 3 — Chemical composition of LBP-AES-wool products

Chemical composition (percentage by mass) %		
SiO_2	$CaO + MgO + Na_2O + K_2O + BaO$	Al_2O_3
≥ 50	≥ 18	≤ 1

5.4.2 LBP-AES-wool products shall not contain asbestos, and the test method shall be conducted according to ISO 22262-2.