

SINTEF Building and Infrastructure confirms that

Leca Iso 10-20

has been found to be fit for use in Norway and to meet the provisions regarding product documentation given in the regulation relating to the marketing of products for construction works (DOK) and regulations on technical requirements for building works (TEK), with the properties, fields of application and conditions for use as stated in this document

1. Holder of the approval

Leca Norge AS
 Årnesvegen 1
 NO-2009 Nordby
www.leca.no

2. Product description

Leca Iso 10-20 is a lightweight aggregate of expanded clay pellets. The grading diameter has a range from 8 mm to 20 mm, with an upper tolerance of +10 % and a lower tolerance of -15 %. Dry density is 250 kg/m³ ±15 %. The pellets have a water repellent and dust binding surface treatment.

The product is CE marked in accordance with EN 15732.

3. Fields of application

Leca Iso 10-20 can be used as a thermal insulating, capillarity breaking and draining layer in floors on the ground and creating height structures on floors. The aggregate can also be used to protect wall foundations and other substructures against frost in the ground, and as a thermal insulating and draining backfill against external basement walls. Leca Iso 10-20 as compensating fundamentation gives reduced weight on the underground and reduced earth pressure. Leca Iso 10-20 is especially well suited for insufflation directly from a truck.

4. Properties

Load-carrying capacity, strength and stiffness, stability

Characteristic value for load bearing capacity at 2 % deformation is 300 kN/m², measured in accordance with EN 13055-2, Annex A.

Crushing strength is minimum 0.8 N/mm², measured in accordance with EN 13055-1, Annex A.

Installation blowing and levelling gives a compression of approx. 6-10 % of the layer thickness.

Geotechnical calculations with Leca Iso 10-20 shall be carried out the same way as for other friction materials. A characteristic friction angle $\phi_k=35^\circ$ and attraction=0 shall be used. See the manufacturer's guidelines for further information.

Properties related to fire

Leca Iso 10-20 is noncombustible and classified as A1 in accordance with EN 15734.

Thermal insulation

Declared thermal conductivity for Leca Iso 10-20 is $\lambda_d < 0.11$ W/(mK) determined according to EN ISO 14063-1. Table 1 shows design thermal conductivity λ_d depending on field of application.

Table1
 Design thermal conductivity for Leca Iso 10-20

Field of application	λ_d W/(mK)
In normal building structures	0.107
In floors on the ground above the capillarity breaking layer	0.107
As a capillarity breaking and draining layer	0.15
As a frost protecting, drained layer	0.12 *

* Frost capacity for the relevant moisture content is included

Properties related to moisture

Capillary suction height is maximum 75 mm measured according to EN 1097-10.

Durability

Leca Iso 10-20 has good frost resistance, and is a ceramic material with high resistance to elevated temperatures and chemicals such as solvents, petrol and other oil-based products.

SINTEF is the Norwegian member of European Organisation for Technical Assessment, EOTA, and European Union of Agrément, UEAtc

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 overvåkende kontroll"

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5. Environmental aspects

Substances hazardous to health and environment

The product is regarded as not containing hazardous substances with priority in quantities that pose an increased risk for human health and environment. Chemicals with priority include CMR, PBT and vPvB substances.

Effect on soil, surface water and ground water

The leaching properties of the product are evaluated to have no negative effects on soil or ground water.

Waste treatment/recycling

Leca Iso 10-20 shall be sorted as clay based material on the building/demolition site. The product shall be delivered to an authorized waste treatment plant for material recovery. Non polutet Leca Iso 10-20 can be used as land fill material.

Environmental declaration

An environmental declaration (EPD) has been worked out according to EN 15804 for Leca Iso10-20. For complete documentation see EPD no. 00120 rev1, www.epd-norge.no.

6. Special conditions for use and installation

Installation

The application of Leca Iso 10-20 in Leca Floor construction is shown in SINTEF Technical Approval No. 2342. See also the manufacturer's brochures.

Transport and storage

Leca Iso 10-20 may be stored outdoor, but will be able to soak up some moisture. Extra moisture will give the product a somewhat higher density, and can at subzero temperatures cause ice formation. For the simplest possible handling of the product, storage under roof is recommended.

Thermal insulation under floors on the ground

U-values for floors on the ground are shown in Building Research Design Guide No. 521.112. Table 2 shows equivalent thicknesses for insulation materials with a design thermal conductivity $\lambda_d = 0.038 \text{ W/(mK)}$ and a drained layer of Leca Iso 10-20 in order to achieve the same thermal resistance. The performance of the Leca Iso 10-20 layer is based on the design thermal conductivities shown in Table 1. Leca Iso 10-20 can be used together with other insulation materials.

Other conditions

The application shall otherwise be in accordance with the recommendations in the following Building Research Design Guides (only available in Norwegian):

- 514.221 *Utvendig fuktsikring av bygninger*
- 521.111 *Golv på grunnen med ringmur. Utførelse*
- 521.112 *Golv på grunnen med ringmur. Varmeisolering, frostsikring og beregning av varmetap*
- 521.811 *Telesikring av uoppvarmede bygninger og konstruksjoner*

Table 2

Equivalent insulation thicknesses for materials with design thermal conductivity $\lambda_d = 0,038 \text{ W/(mK)}$ and Leca Iso 10-20 in floors on the ground

Thickness, mm		Thermal resistance R m ² K/W
Insulation material $\lambda_d = 0,038 \text{ W/(mK)}$	Leca Iso 10-20	
50	160	1.32
100	300	2.63
150	450	3.95
200	590	5.26
250	730	6.60
300	870	7.92

7. Factory production control

The product is produced by Leca Rølingen, Årnesveien 1, 2009 Nordby, Norway.

The holder of the approval is responsible for the factory production control in order to ensure that the product is produced in accordance with the preconditions applying to this approval.

The manufacturing of the product is subject to continuous surveillance of the factory production control in accordance with the contract regarding SINTEF Technical Approval.

The producer has a quality management system according to EN ISO 9001:2008 and EN ISO 14001:2004.

8. Basis for the approval

The approval is primarily based on thermal properties and properties related to moisture which are verified in the following reports:

- Norwegian Building Research Institute, report N 8267 of 20.10.1998 (moisture and thermal insulation)
- Norwegian Building Research Institute, report N 7905 of 20.12.1998 (moisture and thermal insulation)
- Norwegian Building Research Institute, report N 8267-2 of 05.01.1999 (Thermal insulation in slab on ground)
- SINTEF Building and Infrastructure, report B08680 Annual sampling test (thermal conductivity, crushing strength and capillary suction height)
- SINTEF Building and Infrastructure, report SBF IN F09414 of 03.07.2009 (Loadbearing capacity)
- SINTEF Byggforsk, report 102000899-1, Annual sampling test 2015 (thermal conductivity, crushing strength and capillary suction height)

9. Marking

Consignment notes at delivery shall include name of the product, production time, specification of the product, and name of the manufacturer.

The product is CE marked in accordance with EN 15732.

The approval mark for SINTEF Technical Approval No. 2051 may also be used.



Approval mark

10. Liability

The holder/manufacturer has sole product responsibility according to existing law. Claims resulting from the use of the product cannot be brought against SINTEF beyond the provisions of Norwegian Standard NS 8402

for SINTEF Building and Infrastructure

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