

This certificate is valid for Building Regulations & associated technical guidance in force on the date of registration and for the regulations in the countries indicated

## Isolergrund Modular Foundation System

### Description of Product

This is an assessment of Isolergrund a pre-cast, modular foundation system with thermally insulated and sealed crawl space with ventilation unit to maintain negative pressure in the crawl space.

Isolergrund's thermally efficient structure and sealed enclosure prevents mould growth on the underside of the building floor. The negative pressure in the crawl space prevents contaminant transfer into the living space. Isolergrund UK System can be used as a foundation for all types of modular dwellings.



### Key Factors Assessed

□ Health, Hygiene and Environmental

### Validity

This certificate was first issued on 10<sup>th</sup> December 2019 and is valid until 10<sup>th</sup> December 2020.

Issue Dated 10<sup>th</sup> January 2020

## Scope of Registration

This registered system relates to Isolergrund a modular foundation system with thermally insulated and sealed crawl space with ventilation unit to maintain negative pressure in the crawl space. This detail relates purely to the sub-structure which can be used as a crawl space for all types of modular dwellings.

Isolergrund is registered for quality assurance under Nordcert for Precast concrete products - Concrete elements. This is in accordance with EN 13369:2004, and EN 13369:2004/A1: 2006 supplemented with Swedish national requirement and certified in accordance with Nordcert's rules CB5. Daily load testing is undertaken together with weekly testing as part of the Nordcert for quality assurance. The beams have the BBC mark which demonstrates product compliance with Swedish market requirements. The system holds KIWA certification.

All other system components are covered under separate manufacturers own QMS.

### System installation

The system comprises fibre reinforced pre-cast concrete foundation beams laid over compacted gravel base system on suitable bearing strata with 100 KN (100 kPa) minimum bearing capacity. The beams interlock to form the foundation structure, once the beams are in position 100mm high density EPS (Byggsystem Direkt) is fixed to the inside of the beams with barbed securing pegs (Byggsystem Direkt). The foundation is levelled to ensure tolerances of property supplier are met.

Floor Insulation thickness is graduated in line with the accompanying drawing for each specific project. Thickness is graduated from 200mm to 110mm over three sheets to ensure central drainage. With the floor insulation in position the top of the beams are insulated with EPS to remove cold bridge between the ground and the beam. 3M/0867 double-sided tape is used to secure insulation to top of beam.

The whole of the foundation void is sealed with PE membrane (Rani Plast Oy/RaniMoBar/0,2 mm thickness) laid over the beams. For larger areas the PE Membrane can be jointed with minimum 100mm laps using 3M tape 8067. At the low point, rainwater should be able to drain freely away during construction. Form a hole in the membrane. (Seal the opening when the foundation is made weatherproof). Use 3M tape 8067 and make a precise joint, it is important that the repair is air tight, the PE membrane to be under tension over the outside edge of beams.

Lay blue lightweight insulation (Armacell/Fawo Pro/Engineered foam) over PE membrane and then fix top plastic sheet (Exxon Mobil/ HYA600/HDPE Resin) with nail plugs.

Ground stones are laid on the sheet joints and edges to ensure EPS insulation sheets remain fixed in place.

An opening is measured and cut in the EPS and mounted with barbed security pegs to form access hatch. Double sided adhesive is attached to the EPS lining to allow tightening of PE membrane. An opening is cut in the plastic with tape cut into strips a minimum length of opening sides. Surface water is removed and opening is taped and folded into PE membrane. Foam pad and hatch door are then installed.

An electrician registered with a competent person scheme should undertake fan installation. Remote monitoring device is installed with pressure sensors and q warning light provided in a room of the dwelling (typically laundry room). Please note that the edge beam with fan grille must not be placed near the entrance, any terrace or ventilation system fresh air intake.

**For Scotland purposes – the undernoted scope applies in addition to those referred to above:**

This system is intended for use in timber framed construction, and advertised on-line as a foundation solution for villas, modular construction, and apartments.

The units are suitable for typical domestic scale housing. Deemed a suitable system to be used for new build timber frame structures.

The Isolergrund system is designed to be assembled on a flat, level site only.

## Conditions of Certificate

Cannot be used where ground water level is above level of gravel base system.

System is designed for use on ground conditions with a bearing capacity of 100 kPa (100 Kn/m<sup>2</sup>)

Installation to be by authorised installers in strict accordance with manufacturer's instructions, guides and recommendations.

Site investigation report will be required to determine suitability of ground conditions for system use.

Bespoke U value calculations will be required for input into SAP calculations.

An electrician registered with a competent person scheme should undertake fan installation.

**For Scotland purposes – the undernoted conditions apply in addition to those referred to above:**

It would be expected that the design engineer would carry out an individual inspection to confirm the applied design loads do not exceed the foundation load capacities.

The product certificates demonstrate that the system has been tested with the highest value of radon for high risk ground at a value of 1,000,000 Bq/m<sup>3</sup>. The calculations and certificate shows compliance with the Swedish National Board of Building, Planning and Housing's Building Regulations (BBR) whereby under this high risk exposure, the radon limit of 200 Bq/m<sup>3</sup> for indoor air was not exceeded. This limit is in line UK Radon Action Level and therefore it can be confirmed that the foundation system is adequately designed for protection against Radon.

The sealed crawl space in conjunction with ventilation creates negative pressure in the substructure and therefore limits vapour and air transfer to the indoor living space. In lieu of quantitative data that hazardous ground gases are controlled to an acceptable level, the supplier provides reassurance that the negative pressure system is verified with each completed property through independent testing. Therefore, controls are in place to prevent gas transfer to within the dwelling. An example report was issued as part of the supplier's submission for a typical 2 storey villa (Report no. 185844-01). The maintenance of this system and design life warranty details were confirmed via email by the Managing Director of Isolergrund Ltd. on 09/12/2019. In summary, the system is alarmed and can be remotely monitored via a smartphone app.

The Isolergrund fan is maintenance free and has a lifetime warranty of 30 years. There is an option to use a Mechanical Vent with Heat Recovery (MVHR) system in lieu of the fan method whereby the maintenance and alarm system work in the same way. The warranty however would be the responsibility of the MVHR supplier.

### Delivery & Site Handling

Isolergrund take responsibility for deliveries via a specialist strategic load freight company.

Site handling is via the 3rd party main contractor (acting under their own site rules), but with supervision by our authorised contractor regards materials handling methodology, sequence and placement.

Each component is delivered marked and referenced on a purpose-designed, drawn, site layout plan (copied and supplied on weather-proof paper).

### Accessories

Please see attached material specification listing for ancillary products, type and sourcing.

Each project has a unique set of labelled ancillaries.

All components are supplied with their technical datasheets and compliance documents.

### Health & Safety

The Principal Contractor's Site Rules and Health & Safety Plan take precedence on all activities with a health and safety impact.

Only certified personnel (Authorised and Accredited Isolergrund Installing Contractors) are allowed to handle, assemble, commission, test and certify each installation.

The Certified personnel must follow all appropriate Health & Safety legislation and good practice as appropriate to the tasks in hand. Method statements and Risk Assessments to be undertaken as a matter of course on each project.

All materials are provided with their CE documentation and Health & Safety Datasheets for guidance and reference.

Only competent and suitably trained Electrical Contractors may install the fan system and its controls and sensors. They must be prior Certified by Isolergrund via training in order to work in connection with the system.

The specifications and materials referred to have been assessed in accordance with the Building (Scotland) Regulations 2004 and in accordance with the supporting guidance in the Domestic Technical Handbooks which came into force with effect from 1 October 2019.

Where reference is made on a plan or specification document to any Code of Practice, British or European Standard or manufacturer's instruction it shall be construed as a reference to such publication in the form in which it is in force at the date of this Registered Detail.

The materials specified shall be for purposes of this Registered Detail and should not be changed without first gaining approval so to do from Local Authority Building Standards Scotland [LABSS]. Failure to do so will invalidate the Registered Detail.

The Registered Detail shall remain valid until otherwise invalidated by formal notice by LABSS.

The Registered Detail may be re-validated following a request and payment of a renewal fee from the Registered Detail Holder.

This Registered Detail should not be regarded as a formal approval under the building warrant process prescribed by the Building (Scotland) Act 2003 enacted from 1 May 2005.

This Registered Detail shall contribute to compliance with relevant Mandatory Standards specified under the Building (Scotland) Regulations 2004 as amended when sections read with the scope, conditions and regulations to this Registered Detail.



LABC and LABSS consider that, Isolergund Modular Foundation System will meet the functional requirements of the Building Regulations (listed below) if the criteria detailed in this certificate are met;

## The Building Regulations 2010 (as amended) England & Wales

Please refer to individual Regulations below.



## The Building Regulations 2010 (as amended) England

Regulation 7 (2018) Materials and workmanship

Note: Subject to the Scope of Registration and Conditions of Certificate.

AD A (2013) Structure

Note: Subject to the Scope of Registration and Conditions of Certificate.

AD C (2013) Site preparation and resistance to contaminants and moisture

Note: Subject to the Scope of Registration and Conditions of Certificate.

AD L1A (2016) Conservation of fuel and power in new dwellings

Note: Subject to the Scope of Registration and Conditions of Certificate.

AD P (2013) Electrical Safety – dwellings

Note: Subject to the Conditions of Certificate.



## The Building Regulations 2010 (as amended) Wales

Regulation 7 (2013) Materials and workmanship

Note: Subject to the Scope of Registration and Conditions of Certificate.

AD A (2010) Structure

Note: Subject to the Scope of Registration and Conditions of Certificate.

AD C (2010) Site preparation and resistance to contaminants and moisture

Note: Subject to the Scope of Registration and Conditions of Certificate.

AD L1A (2016) Conservation of fuel and power in new dwellings

Note: Subject to the Scope of Registration and Conditions of Certificate.

AD P (2010) Electrical Safety – dwellings

Note: Subject to the Conditions of Certificate.



## The Building (Scotland) Regulations 2004 (as amended)

The Building (Scotland) Regulations 2004 (as amended)

Technical Handbooks Domestic and Non-Domestic

Regulation 8 Durability, workmanship and fitness of materials

0.8.5: Ways of establishing the fitness of materials

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Regulation 9 | Building Standards applicable to construction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Note:        | Construction shall be carried out so that the work complies with the applicable requirements of schedule 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Mandatory    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Standard 1.1 | Structure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Note:        | The system should be constructed and installed in accordance with the manufacturer's details and by an approved contractor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Mandatory    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Standard 3.1 | Site preparation – harmful and dangerous substances                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Note:        | The system should be constructed and installed in accordance with the manufacturer's details and by an approved contractor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Mandatory    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Standard 3.2 | Site preparation – protection from radon gas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Note:        | <p>The system should be constructed and installed in accordance with the manufacturer's details and by an approved contractor.</p> <p>Ground gas exposure is typically Nil to negative as the negative pressure zone in the crawl space is designed to prevent gas transfer to within the dwelling. Each and every completed property is independently tested to ensure that the negative pressure is at minimum 2Pa negative greater than the internal property negative pressure.</p> <p>See test results from a typical 2 storey Villa property by Independent Testing Laboratory, Eurofins and also RISE Test Reports.</p> |
| Mandatory    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Standard 3.3 | Flooding and groundwater                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Note:        | <p>The influence of water table on the foundation system should be fully described. The system cannot be used where the ground water level is above level of gravel base system.</p> <p>A site investigation report will be required to determine suitability of ground conditions for system use.</p>                                                                                                                                                                                                                                                                                                                         |
| Mandatory    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Standard 3.4 | Moisture from the ground                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Note:        | The system can contribute to satisfying this Standard.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Mandatory    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Standard 6.2 | Building insulation envelope                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Note:        | The system can contribute to satisfying this Standard.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

## Non-Regulatory Information



### LABC Warranty

The use of the Isolergrund Modular Foundation System has not been assessed to meet the requirements of the LABC Warranty Technical Manual. If you would like to discuss a specific use please make an enquiry to [technical.services@labcwarranty.co.uk](mailto:technical.services@labcwarranty.co.uk)

## Supporting Documentation

3M Product Data Sheet Flexible Air Sealing Tape 8067E Fast-F

8P07134C Moisture and Temperature Calculation, London

9P01045A Effective U value

9P01045B EN,sign

9p01045C Moisture calculation

9P01045D Radon

BD-000 – Sektioner

BD19-000 - LABC – England

BD19-000-01 - LABC – England

BD19-000-02 - LABC – England

CD008-ENG

CelltermAB\_EPS60\_80\_300-190319\_v2 - EPS details

EUF129-19001613-C Isolergrund UK-System 27.3.2019 –signed

HD\_EPS\_Type Testing Report

Isolergrund Installation instructions UK-system 09 2019

Ja“mfo“relseprov 18-06-11

KIWA\_Cert1037\_18022017

KIWA Cert Isolergrund\_TG1037\_Eng\_Text

MaterialSpecification\_RevA

NordCert\_Certificate\_BDS\_2019

NordCert\_cb-5e-certification-precast-utg.-5-2017-02-21

PEAB Concrete Test 18-06-11\_Eng\_Translation

PEAB\_comparativestrength Test\_2019

Pressure Test\_Cellterm EPS Board

Pressure Test\_EPS Insulation Boards Light

RISE(SP)\_EPS\_Performance Test Results\_SCO371\_15

SP\_RISE\_Report\_5P04343-02\_Eng

SP\_RISE\_Report5P04343-01\_EngTranslation

RIBA\_eps \_creepstatement

SP\_Report\_groundbeam strength P803926\_Eng

SP\_HD\_EPS\_Report\_5P04343\_Eng

**For Scottish purposes:**

Structural Assessment by Dundee City Council Design and Property Division

PEAB: Concrete Comparative Test

PEAB Test Report 20111811

PEAB RAPPORT 20109162

Kiwa TYPGODKANNANDEBEVIS 1037

RISE Report, SP Calculation - Effective U-value for floor joist structure

RISE Report, SP Calculation - Temperature calculation for concrete foundation wall

RISE Report, SP Calculation – Moisture calculations for modified UK-system

RISE Report, SP Calculation – Calculation of radon levels indoors for an extreme case

SP Report 0402-CPR-SC0372-15; Summary of initial type-testing report for expanded polystyrene (EPS)

SP Report on ballast test of ground beams

Product Certificate

Foundation System Details Drawing PE 2018-08-22; CD008-ENG

Technical Declarations – English Texts, 50 Years Age-resistant building film

Technical Declarations – English Texts, Declaration of Performance

Nordcert, Certification rules

ISOLERGRUND AUTHORISED CONTRACTOR TRAINING Documentation

ISOLERGRUND INSTALLATION INSTRUCTIONS FOR ISOLERGRUND UK-SYSTEM

ISOLERGRUND MATERIAL SPECIFICATION ISOLERGRUND UK-SYSTEM

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