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CERTIFICATE No. 2024-0067-1

of TYPE III ENVIRONMENTAL DECLARATION

Product:

Insulation boards:

- IZOROL-L
- IZOROL-PP
- IZOROL-SR
- IZOROL-SR/KL

Manufacturer:

KOTAR Sp. z o.o.
ul. Tadeusza Kościuszki 33; 56-100 Wołów
NIP: 917-000-27-93

confirms the correctness of the data included in the development of the Type III Environmental Declaration and accordance with the requirements of the standard:

EN 15804:2012+A2:2019

Sustainability of construction works --
Environmental product declarations --
Core rules for the product category of construction products

This certificate, issued for the first time on 14/02/2025 and is valid for 5 years or until amendment of mentioned Environmental Declaration.



Director of the Certification
Department
CERTBUD Sp. z o.o.

Kamil PAWŁOWSKI

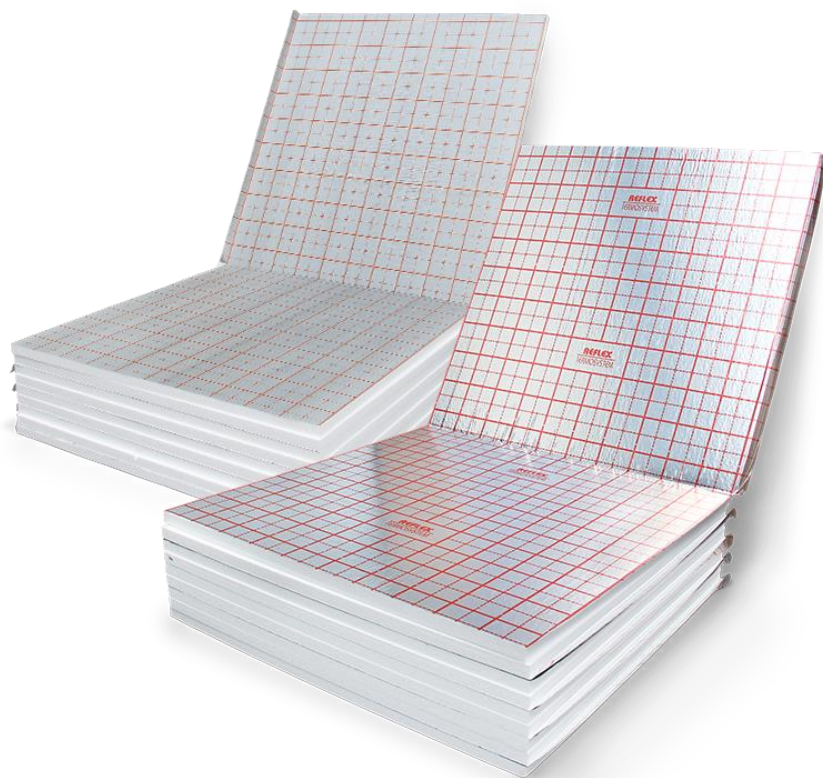
Warsaw, 14/02/2025

ENVIRONMENTAL PRODUCT DECLARATION

EPD Ref. No. 2024-0067-1

KOTAR

INSULATION BOARDS



OWNER OF THE EPD:

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In accordance with EN 15804+A2

EPD PROGRAM OPERATOR:

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DATE OF ISSUE:

14-02-2025

VALIDITY ISSUE:

14-02-2030

Declared unit (DU): 1 m²

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1. GENERAL INFORMATION


This Environmental Product Declaration (EPD) is developed in accordance with the European standard EN 15804 and ISO 14025. It contains the information on the impacts of the declared construction materials on the environment.

EPDs may not be comparable if they do not comply with the EN 15804 standard and if the core systems are not based on the same database.

| | |
|-------------------------------------|---|
| Owner of the EPD | KOTAR Sp. z o.o. ul. Tadeusza Kościuszki 33, 56-100 Wołów NIP: 9170002793 e-mail: sekretariat@kotar.pl www.kotar.pl |
| EPD program operator | CERTBUD Sp. z o.o. ul. Mokotowska 46 lok. 8, 00-543 Warszawa e-mail: biuro@certyfikacja-certbud.pl www.certyfikacja-certbud.pl |
| Declared product(s) | Insulation boards: <ul style="list-style-type: none">• IZOROL-L• IZOROL-PP• IZOROL-SR, IZOROL-SR/KL |
| Declaration reference number | EPD Ref. No. 2024-0067-1 |
| PCR | PCR in accordance with EN 15804+A2:2019 |
| Date of issue | 14-02-2025 |
| Validity date | 14-02-2030 |
| Declared unit | 1 m ² |
| Life cycle analysis (LCA) | A1-A3, C1-C4, D modules |
| Service Life | Depending on the application, no more than 50 years |
| Reason for performing LCA | Bussines-to-bussines |
| Representativeness | Polish product, 2023 |

2. VERIFICATION

This Environmental Product Declaration (EPD) has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue if the underlying data have not changed significantly.

| |
|--|
| CEN EN 15804 standard serves as the main PCR document. |
| Independent verification corresponding to ISO 14025:2010 <input type="checkbox"/> Internal <input checked="" type="checkbox"/> External |
| Third party verifier:  Monika Kotkiewicz, CERTBUD Sp. z o.o. |
| External verification of EPD: Monika Kotkiewicz, CERTBUD Sp. z o. o. Input data verification, LCA: Damian Bulski, CEexpert Verification of LCA: Dominik Migas, CERTBUD Sp. z o. o. |

Note: CERTBUD Sp. z o. o. is a notified body (No. 2310) of the European Commission and Member States designated for the tasks specified in the Regulation (EU) No 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products. In addition, CERTBUD Sp. z o.o. is a unit accredited by the Polish Centre for Accreditation - in the field of certification of construction products (accreditation number AC 158). CERTBUD Sp. z o.o. acts as an independent, third-party verification organization (17065/17025 certified).




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3. MANUFACTURER

Established in 1992 **KOTAR Sp. z o.o.** is one of the main manufacturers of thermal insulation materials used in floor heating installation. More than three decades of experience has translated into a very well established position of Kotar on Polish, European and Asian market.



Figure 3.1: View of the company's production plant in Wołów, Poland

The brand products support modern construction industry and help to lower the costs of buildings' maintenance. Carefully selected materials and production technology result in Kotar's solutions being preferred by both individual and corporate customers. Kotar's products are durable, effective and easy to install. They meet a variety of needs. The thermal insulation systems are used in residential and public buildings. Kotar has won numerous prizes awarded for the most dynamically developing Polish companies, including Forbes Diamonds and „Gazela Biznesu” (Business Gazelle Award).

Kotar systems are available not only in Poland, but also in over 20 countries in Europe and Asia.

4. DESCRIPTION AND CLASSIFICATION OF PRODUCTS

IZOROL insulation boards are a high-quality solution, which is used especially in the case of water floor heating in residential and public utility buildings as effective thermal, acoustic and moisture insulation. They are manufactured from polystyrene boards, in accordance with the EN 13163 standard, 1m wide, covered on one side with polypropylene fabric or PE and PP foil laminate in a metalized version. Thanks to the various variants, differing in the type of polystyrene, packaging system and type of covering, Izorol boards can be perfectly adapted to the individual needs of the customer.

The products are available: loosely in the form of sheets folded in half, unprotected by foil, and in the form of collective packages, wrapped in PE foil, protecting against damage during transport and storage. The top layer of foil and fabric has prints in the form of continuous and dashed or dotted lines, vertically and horizontally, alternating every 5 cm, which create a grid, thanks to which precise arrangement of underfloor heating pipes is facilitated.

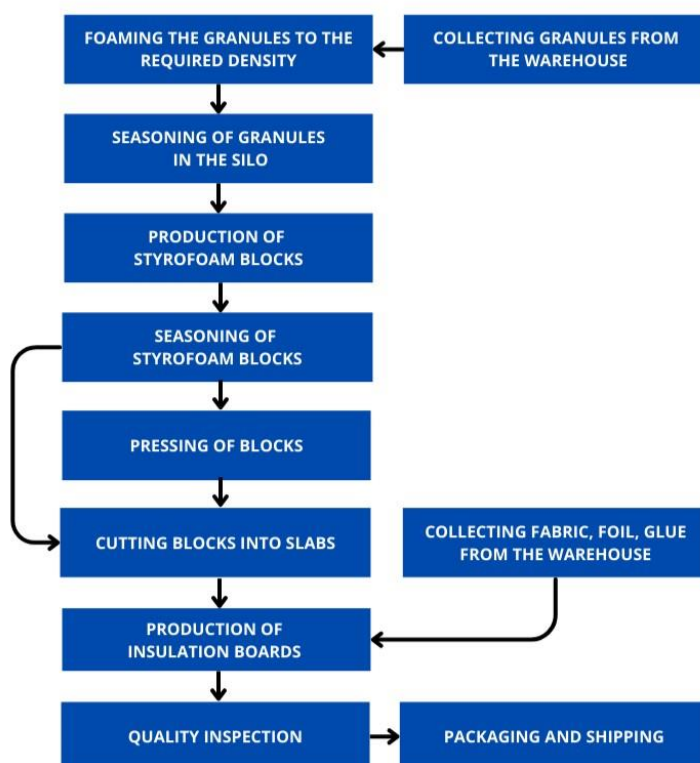


Figure 4.1: Simplified production scheme of insulation boards

All types of boards offered have not only certificates of compliance with Polish and European standards, but also additional CE certificates of compliance with the EN 13172 standard and certificates allowing the products to be used on the German market, which underlines their high quality and reliability.

Manufactured types of insulation boards:

- **IZOROL-L board** - made of styrofoam board, 1m wide, covered on one side with a laminate of polyethylene and metallized polypropylene foil 0.13mm thick. Available loosely as a 5m board folded in half, unprotected with PE foil. The board in the styrofoam layer has cuts that facilitate its folding, transport and assembly. The above packaging system is available for all offered types of styrofoam (EPS 100, EPS 200, EPS T 040, EPS T 045), in the thickness range: 20-50mm; board dimensions: 5m x 1m.

IZOROL-L boards are also available in the following variants:

- **IZOROL-L PACK board** – made of styrofoam board, 1m wide, covered on one side with a laminate of polyethylene and metallized polypropylene foil with a thickness of 0.13mm. The board is 10m long, in the styrofoam layer it has cuts, thanks to which the board is folded into a cube shape, secured with PE foil, which ensures comfort during transport and storage. The above packaging system is available for all offered types of styrofoam (EPS 100, EPS 200, EPS T 040, EPS T 045), in the thickness range: 20-40mm; board dimensions: 10m x 1m;
- **IZOROL-L DUO board** - made of styrofoam board, 1m wide, covered on one side with a laminate of polyethylene and metallized polypropylene foil with a thickness of 0.13mm. The board is 2m long, folded in half. 5 boards are packed in a protective PE foil, thus creating the shape of a cube, which ensures comfort in transport and storage. The above packaging system is available for all offered types of styrofoam (EPS 100, EPS 200, EPS T 040, EPS T 045), in the thickness range: 15-50mm; board dimensions: 2m x 1m;

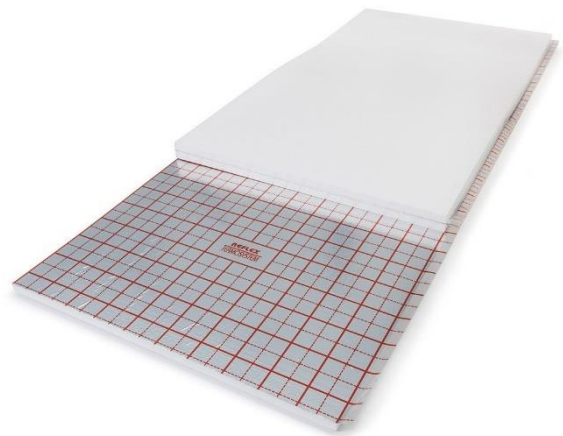


Figure 4.2: IZOROL-L insulation board

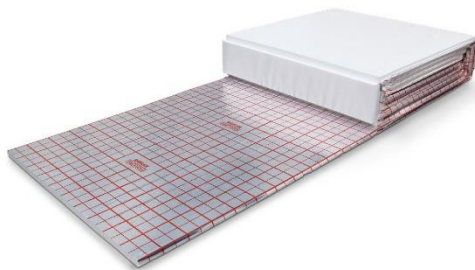


Figure 4.3: IZOROL-L PACK insulation board

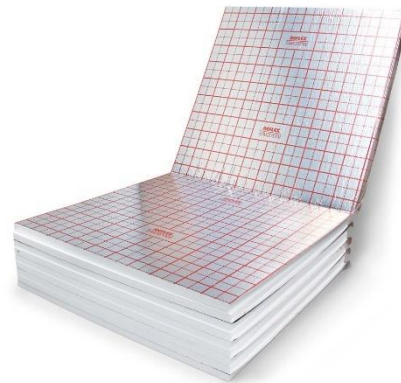


Figure 4.4: IZOROL-L DUO insulation board

- **IZOROL-PP board** - made of a 1m wide polystyrene board, covered on one side with polypropylene fabric coated with polypropylene. The main advantage of the Izorol-PP board is the high level of tear strength of the top layer of the board (fabric) - this is particularly important in the case of single-layer pipes requiring stronger anchoring in the insulation. It is made of a 1m wide polystyrene board, covered on one side with polypropylene fabric coated with polypropylene. It is available loosely in the form of a 5m board folded in half, unprotected with PE foil. The board in the polystyrene layer has cuts that facilitate its folding and transport. The above packaging system is available for all offered types of polystyrene (EPS 100, EPS 200, EPS T 040, EPS T 045), in the thickness range: 20-50mm; board dimensions: 5m x 1m.

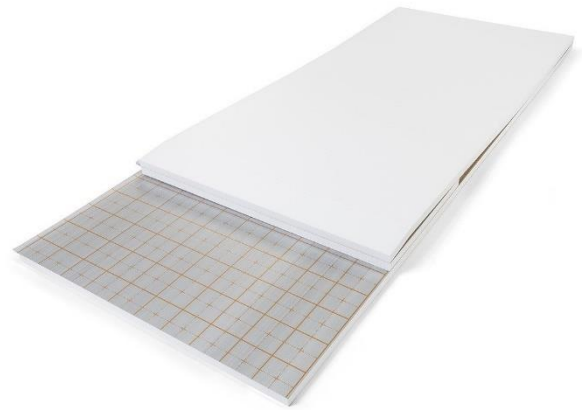


Figure 4.5: IZOROL-PP insulation board

IZOROL-PP boards are also available in the following variants:

- **IZOROL-PP PACK board** - made of styrofoam board, 1m wide, covered on one side with polypropylene fabric coated with polypropylene. The board is 10m long, in the styrofoam layer it has cuts, thanks to which the board is folded into a cube shape, secured with PE foil, which ensures comfort in transport and storage. The above packaging system is available for all offered types of styrofoam (EPS100, EPS 200, EPS T 040, EPS T 045), in the thickness range: 20 - 40mm; board dimensions: 10m x 1m;
- **IZOROL-PP DUO board** - made of styrofoam board, 1m wide, covered on one side with polypropylene fabric coated with polypropylene. The board is 2m long, folded in half. 5 boards are packed in a protective PE foil, thus creating a cube shape, which ensures comfort in transport and storage. The above packaging system is available for all offered types of polystyrene (EPS 100, EPS 200, EPS T 040, EPS T 045), in the thickness range: 15 - 50mm; board dimensions: 2m x 1m;

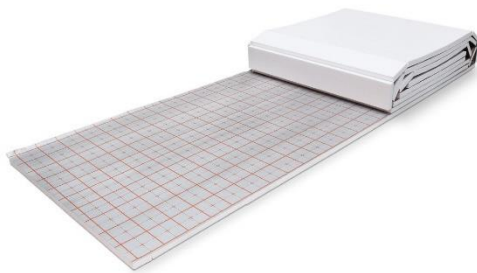


Figure 4.6: IZOROL-PP PACK insulation board

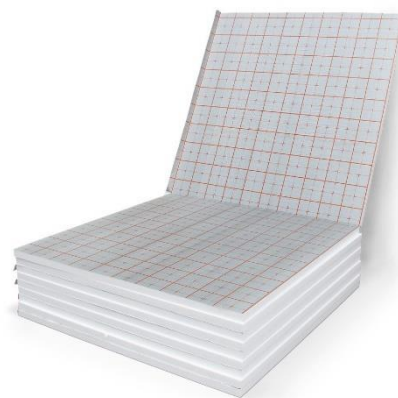


Figure 4.7: IZOROL-PP DUO insulation board

Table 4.1: Technical specification for IZOROL-L and IZOROL-PP insulation boards

| Property | Unit | Class | IZOROL-L | IZOROL-PP |
|---|----------------------|------------------------|--|--|
| | | | Requirements | Requirements |
| Length | mm | L(3) L(2) | - 1% ; + is not limited ± 2 mm | - 1% ; + is not limited ± 2 mm |
| Width | mm | W(2) W(3) | ± 2 mm $\pm 0.6\%$ lub ± 3 mm | ± 2 mm $\pm 0.6\%$ lub ± 3 mm |
| Thickness | mm | T(2) T(1) T(0) | ± 2 mm ± 1 mm -0; +10% or 2mm for dL< 35mm -0; +15% or 3mm for dL \geq 35mm | ± 2 mm ± 1 mm -0; +10% or 2mm for dL< 35mm -0; +15% or 3mm for dL \geq 35mm |
| Squareness | mm/m | S(5) S(2) | ± 5 mm/1000 mm ± 2 mm/1000 mm | ± 5 mm/1000 mm ± 2 mm/1000 mm |
| Flatness | mm | P(10) P(5) | ± 10 mm ± 5 mm | ± 10 mm ± 5 mm |
| Bending strength | kPa | BS50 BS150 BS250 | ≥ 50 ≥ 150 ≥ 250 | ≥ 50 ≥ 150 ≥ 250 |
| Compression stress levels at 10% relative deformation | kPa | CS(10)100 CS(10)200 | ≥ 100 ≥ 200 | ≥ 100 ≥ 200 |
| Dimensional stability in normal constant laboratory conditions | % | DS(N)5 | ± 0.5 | ± 0.5 |
| Dimensional stability in set temperature conditions (70 ° C, 48h) | % | DS(70,-)2 | max 2 | max 2 |
| Deformation in set compression load and temperature: Load: 20 kPa, temperature: 80 \pm 1° , time: 48 \pm 1h Load: 40 kPa, temperature: 70 \pm 1° , time: 168 \pm 1h | % | DLT(1)5 DLT(2)5 | ≤ 5 ≤ 5 | ≤ 5 ≤ 5 |
| Compressibility | mm | CP2 CP3 | ≤ 2 ≤ 3 | ≤ 2 ≤ 3 |
| Dynamic stiffness | mMN/m ³ m | SD 15,20,25,30 | $\leq 15, \leq 20, \leq 25, \leq 30$ | $\leq 15, \leq 20, \leq 25, \leq 30$ |
| Declared thermal conductivity EPS 100; EPS 200; EPS T 040; EPS T 045 | W/mK | -- | 0.038; 0.034; 0.040; 0.045 | 0.038; 0.034; 0.040; 0.045 |
| Fire reaction | -- | E | -- | -- |

- **KOTAR-SR INSULATION AND RENOVATION SYSTEM** - a system consisting of Izorol-SR or Izorol- SR/KL insulation boards and innovative SR Clips developed by KOTAR's technical department. These products are dedicated for use in renovation systems and in rooms where there is not enough space for a high insulation layer.

The following board variants are available in the SR SYSTEM:

- **IZOROL-SR board** - made of styrofoam board, 1m wide, covered on one side with polypropylene fabric coated with polypropylene. The board is 2m long, folded in half. 10 boards are packed in a protective PE foil, thus creating a package that ensures comfort in transport and storage. The above packaging system is available for styrofoam EPS 200, EPS T, in the thickness range: 10mm, 12mm, 15mm; board dimensions: 2m x 1m;

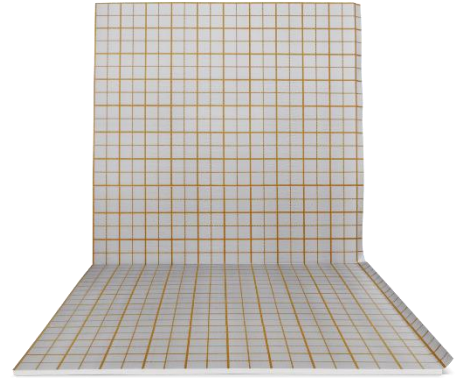


Figure 4.8: IZOROL-SR insulation board

- **IZOROL-SR/KL board** – made of styrofoam board, 1m wide, covered on one side with polypropylene fabric coated with polypropylene and an additional layer of glue on the bottom (bottom layer of the product), protected with a transparent foil. The glue used in the bottom layer of the IZOROL-SR/KL board is used to attach the insulation board to the substrate, and the foil applied to it serves as a protection for the bottom layer of the product during transport and is peeled off during installation. The board is 1m long. 20 boards are packed in a protective PE foil, thus creating a package that ensures comfort in transport and storage. The above packaging system is available for styrofoam EPS 200, EPS T, in the thickness range: 10mm, 12mm, 15mm; board dimensions: 2m x 1m



Figure 4.9: IZOROL-SR/KL insulation board

Table 4.2: Technical specification for IZOROL-SR and IZOROL-SR/KL (EPS 200) insulation boards

| Property | Unit | Class | Requirements * | Measured values |
|---|------|-----------|--------------------|-------------------|
| Length | mm | L(2) | ± 2 mm | -- |
| Width | mm | W(2) | ± 2 mm | -- |
| Thickness | mm | T(1) | ± 1 mm | -- |
| Squareness | mm/m | S(2) | ± 2 mm/1000 mm | -- |
| Flatness | mm | P(5) | 5 mm | -- |
| Bending strength | kPa | BS250 | ≥ 250 | -- |
| Levels for compressive stress at 10% deformation | kPa | CS(10)200 | ≥ 200 | 239.3 for 10mm** |
| Dimensional stability under constant normal laboratory conditions | % | DS(N)5 | ± 0.5 | -- |
| Dimensional stability under specified temperature and humidity conditions (70° C, 48h) | % | DS(70,-)2 | max 2% | -- |
| Deformation under specified compressive load and temperature conditions (load: 40kPa, temperature: 70 \pm 1° C, time: 168 \pm 1h) | % | DLT(2)5 | $\leq 5^1$ | -- |
| Declared thermalconductivity | W/mK | -- | 0,034 | 0.0308 for 10mm** |
| Maximum permissible load (compressive stress at 20% deformation per 1m2 of the product) | kN | -- | -- | 3.824 for 10mm*** |
| Reaction to fire | -- | E | -- | -- |
| Dimensions of the board IZOROL-SR EPS 200 | mm | -- | 2000 x 1000 | -- |
| Dimensions of the board IZOROL-SR/KL EPS 200 | mm | -- | 1000 x 1000 | -- |

¹ At thicknesses < 20mm the requirement is 1mm instead of 5%

* According to EN 13163:2012 +A1:2015 standard

** Values measured in the Kotar laboratory under the project: „Kotar SR insulation and renovation system”

*** Values measured in the Wrocław University of Technology under the project: „Kotar SR insulation and renovation system”

Table 4.3: Technical specification for IZOROL-SR and IZOROL-SR/KL (EPS T) insulation boards

| Property | Unit | Class | Requirements * | Measured values |
|--|--------------------|-----------|---|---------------------------|
| Length | mm | L(3) | $\pm 0.6\%$ or $\pm 3 \text{ mm}^1$ | -- |
| Width | mm | W(3) | $\pm 0.6\%$ or $\pm 3 \text{ mm}^1$ | -- |
| Thickness | mm | T(1) | -5% or -1mm ¹ ; +15% or 3mm ¹ | -- |
| | | T(0) | -0; +10% or 2mm for dL<35mm -0; +15% or 3mm for dL≥ 35mm | -- |
| Squareness | mm/m | S(5) | $\pm 5 \text{ mm}/1000 \text{ mm}$ | -- |
| Flatness | mm | P(10) | 10 mm | -- |
| Bending strength | kPa | BS50 | ≥ 50 | -- |
| Dimensional stability under specified temperature and humidity conditions (70° C, 48h) | % | DS(70,-)2 | max 5% | -- |
| Compressibility | mm | CP2 | ≤ 2 | -- |
| Dynamic stiffness | MN/1m ³ | SD20 | ≤ 20 | SD17 for 15mm; ≤ 17 |
| The weighted reduction of impact sound pressure level | dB | SD20 | Δ Lw= 29 | Assuming SD25 Δ Lw= 28 |
| Declared thermal conductivity | W/mK | -- | 0.040 | -- |
| Reaction to fire | -- | E | -- | -- |
| Dimensions of the board IZOROL-SR EPS T | mm | -- | 2000 x 1000 | -- |
| Dimensions of the board IZOROL-SR/KL EPS T | mm | -- | 1000 x 1000 | -- |

¹ Whichever gives the greatest numerical tolerance

* According to EN 13163:2012 +A1:2015 standard

** Values measured in the Kotar laboratory under the project: „Kotar SR insulation and renovation system”

5. LIFE CYCLE ASSESSMENT (LCA) - RULES

5.1. DECLARED UNIT (DU)

The declaration refers do declared unit – 1 m² of insulation board manufactured by KOTAR Sp. z o.o.

5.2. ALLOCATION

The allocation rules used for this EPD are based on EN 15804+A2. The production of insulation boards is a process carried out in one production plant of KOTAR Sp. z o.o. located in Wołów, Poland. For the life cycle assessment (LCA) calculation purpose – mass basis allocation was done.

5.3. SYSTEM BOUNDARY

The system limits for the environmental characteristics of insulation boards are shown in figure 5.1. Data used in LCA calculation were declared by manufacturer and reflected the actual status of the year 2023.

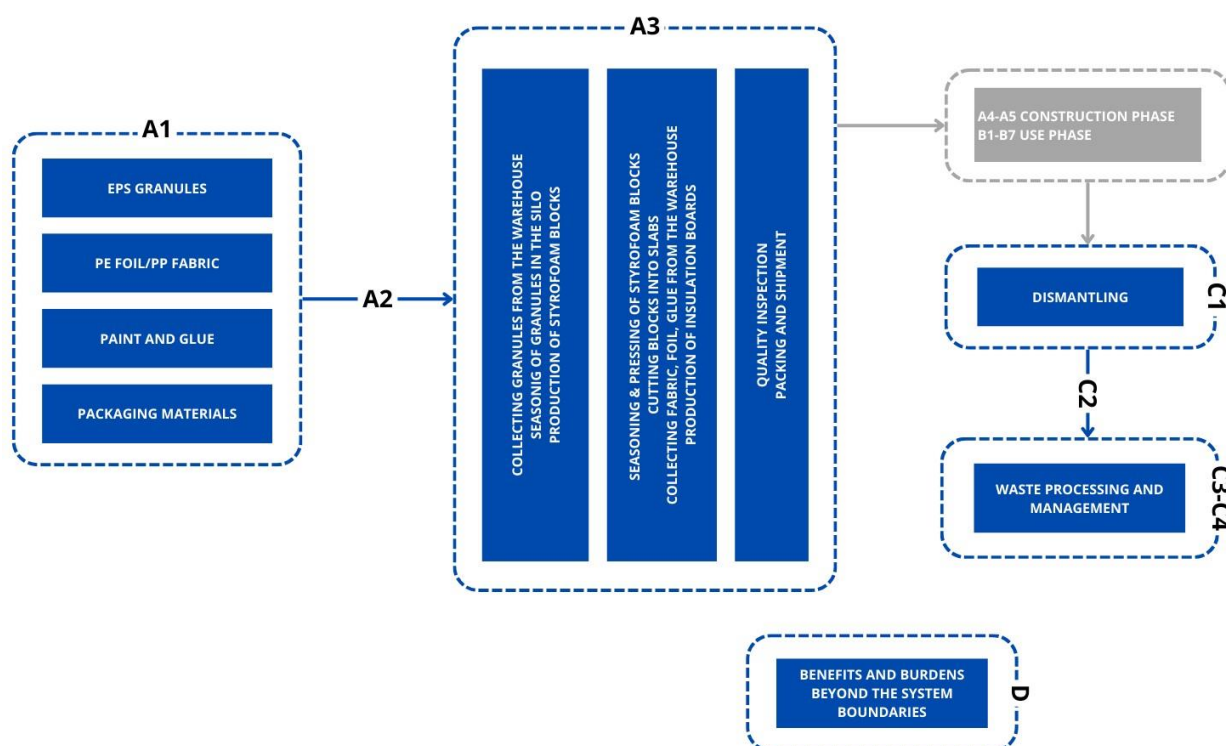


Figure 5.1: System boundaries used for environmental characterization

Legend:

----- defined modules

----- undefined modules

This Environmental Product Declaration includes a life cycle assessment (LCA) for the Cradle-to-Gate (A1- A3), with C1-C4 and D modules according to EN 15804+A2. Modules A4-A5 and B1-B7 are not included. Impacts from the global line production at KOTAR Sp. z o.o. were inventoried and 56% were allocated to the production of insulation boards in terms of annual production volume expressed in unit of mass.

5.3.1. A1 – RAW MATERIALS SUPPLY

This module takes into account the extraction and processing of all raw materials, as well as energy consumption. The extraction and consumption of raw materials refers to specific mass shares in the production process per unit of declared product. Raw materials for the production of components of insulation boards come from Polish and foreign suppliers.

5.3.2. A2 – TRANSPORT TO THE PRODUCTION SITE

Raw materials are transported to the production plant from Polish and foreign suppliers. Distances from the place of obtaining raw materials to the production plant are individual for each raw material. The means of transport were diversified depending on the method of delivery of raw materials. The adopted model includes road transport (average values) for each raw material. For calculation purposes European fuel averages are applied in module A2.

5.3.3. A3 – PRODUCTION

Module A3 covers all production-related process – including the production of insulation boards components, their packaging and internal transport.

A schematic of the production line for insulation boards at KOTAR Sp. z o.o. is shown in Fig. 4.1 .

This module takes into account energy consumption and wastages generated in the production plant, as well as losses generated in the production process.

5.3.4. C1-C2 – DEMOLITION AND TRANSPORT

The end of life stage commence with demolition. C1 module covers object's deconstruction within selective waste collection at deconstruction location (tab. 5.1).

C2 module is the beginning of waste treatment and describe waste transport. It was assumed that waste transport carried out to waste management plant and landfill (tab. 5.1). For calculation purposes European fuel averages are applied.

5.3.5. C3-C4 – WASTE PROCESSING AND MANAGEMENT

For the purpose of life cycle analysis, scenarios were developed for modules C3 and C4. In C3 module was assumed that 30% of waste from insulation boards is used in energy recovery. The remaining 70% will undergo landfilling (tab. 5.1).

Table 5.1: End of life scenario for insulation boards

| Module | Assumption |
|--------|---|
| C1 | <ul style="list-style-type: none"> 0.004 l/m² – consumption of diesel per declared unit |
| C2 | <ul style="list-style-type: none"> 50 km – landfill 50 km – waste management plant |
| C3 | <ul style="list-style-type: none"> 30% - energy recovery |
| C4 | <ul style="list-style-type: none"> 70% - landfilling |

5.3.6. D – BENEFITS AND LOADS BEYOND THE SYTEM BOUNDARY

Module D describe the environmental benefits and loads of reuse, recycling and energy recovery of waste materials at the end of life.

In the adapted scenario, benefits were calculated for 30% of insulations board waste going to incineration – energy recovery.

| | |
|-------------------------------|--|
| DATA COLLECTION PERIOD | The data regarding the production of products refer to period from 01.01.2023 to 31.12.2023. |
| DATA QUALITY | The values determined to calculate the LCA originate from verified KOTAR Sp. z o.o. inventory data. The LCA analysis uses data prepared based on actual consumption at the production site. The details collected are no more than two years old. |
| CALCULATION RULES | The impacts of the representative KOTAR Sp. z o.o. products were aggregated using weighted average. The weighted average method was used according to the percentage of each product in production of insulation boards based on the relations to whole production quantity. Impacts were calculated for all products and are shown in table 6.3. The LCA analysis was conducted in accordance with the EN 15804+A2. |
| CUT-OFF CRITERIA | All-important parameters from collected production data, i.e. all materials used by recipe, electricity consumed, internal fuel consumption and thermal energy, direct production waste, and the results of all available emission measurements were included in the calculations. In accordance with EN 15804, machinery and equipment (capital assets) needed for and during production, as well as the transportation of production facility employees, were not included. The sum of the omitted total mass flows does not exceed 1% and excluded consumption of renewable and non-renewable primary energy is no more than 1% according to EN 15804+A2. |
| BACKGROUND DATA | The main source of general and auxiliary data is the Ecoinvent 3.9 database. |

6. LIFE CYCLE ASSESSMENT (LCA) - RESULTS

Life cycle assessment (LCA) of this environmental declaration covers A1-A3, C1-C4, D modules („cradle to gate” with C1-C4, D). Table 6.1 shows the LCA modules considered in calculating the environmental impact categories for the products covered by this declaration.

Table 6.1: Modules defined and not declared in system boundaries

| Product stage | | | Construction process stage | | Use stage | | | | | | | End of life stage | | | | |
|---------------------|-----------|---------------|----------------------------|---------------------------|-----------|-------------|--------|-------------|---------------|------------------------|-----------------------|---------------------------|-----------|------------------|----------|--------------------------------------|
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| Raw material supply | Transport | Manufacturing | Transport | Construction installation | Use stage | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction/demolition | Transport | Waste processing | Disposal | Reuse, recovery, recycling potential |
| X | X | X | MND | MND | MND | MND | MND | MND | MND | MND | MND | X | X | X | X | X |

X – modules defined

MND – modules not declared

Indicators describing environmental impact of product can be categorized as general environmental impacts, additional impacts and environmental aspects related to resources. The abbreviations and its explanations used to describe the environmental impact of insulation boards are shown below (tab. 6.2).

The table 6.3 presents the results of the LCA analysis for mentioned above products.

To convert the LCA results for insulation boards of different thicknesses, the conversion factors in table 6.4 should be used.

Table 6.2: Abbreviations and its explanations used in LCA analysis

| ENVIRONMENTAL IMPACT INDICATORS | |
|---------------------------------|---|
| GWP-total | Global Warming Potential – total |
| GWP-fossil | Global Warming Potential - fossil |
| GWP-biogenic | Global Warming Potential - biogenic |
| GWP-luluc | Global Warming Potential - land use and land use change |
| ODP | Stratospheric ozone depletion potential |
| AP | Soil and water acidification potential |
| EP-freshwater | Eutrophication potential - freshwater |
| EP-marine | Eutrophication potential - seawater |
| EP-terrestrial | Eutrophication potential - terrestrial |
| POCP | Potential for photochemical ozone synthesis |

| | |
|------------------------|---|
| ADP-minerals & metals* | Potential for depletion of abiotic resources - non-fossil resources |
| ADP-fossil* | Abiotic depletion potential – fossil fuels |
| WDP* | Water deprivation potential |

ENVIRONMENTAL ASPECTS RELATED TO RESOURCE INDICATORS

| | |
|--------|--|
| PERE | Use of renewable primary energy excluding renewable primary energy resources used as raw materials |
| PERM | Use of renewable primary energy resources used as raw materials |
| PERT | Total use of renewable primary energy resources |
| PEN-RE | Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials |
| RE | Use of non-renewable primary energy resources used as raw materials |
| PENRT | Total use of non-renewable primary energy resources |
| SM | Use of secondary material |
| RSF | Use of renewable secondary fuels |
| NRSF | Use of non-renewable secondary fuels |
| FW | Use of net fresh water |

ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES INDICATORS

| | |
|------|-------------------------------|
| HWD | Hazardous waste disposed |
| NHWD | Non-hazardous waste disposed |
| RWD | Radioactive waste disposed |
| CRU | Components for reuse |
| MFR | Materials for recycling |
| MER | Materials for energy recovery |
| EEE | Exported electrical energy |
| EET | Exported thermal energy |

ADDITIONAL ENVIRONMENTAL IMPACTS INDICATORS

| | |
|---------|--|
| PM | Particulate matter |
| IRP** | Potential human exposure efficiency relative to U235 |
| ETP-fw* | Potential comparative toxic unit for ecosystems |
| HTP-c* | Potential comparative toxic unit for humans (cancer effects) |
| HTP-nc* | Potential comparative toxic unit for humans (non-cancer effects) |
| SQP* | Potential soil quality index |

*The results should be used with caution because there is high uncertainty or limited experience with these indicators.

**Apply mainly the possible impact of the nuclear fuel cycle on human health resulting from low ionizing radiation.

Table 6.3 : LCA analysis results for 1 m² of insulation boards (average thickness – 0.03 m)

| Results per 1 m ² : insulation boards | | | | | | | | | | |
|--|------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| ENVIRONMENTAL IMPACTS | | | | | | | | | | |
| PARAMETER | UNIT | A1 | A2 | A3 | A1-A3 | C1 | C2 | C3 | C4 | D |
| GWP-total | eq. kg CO ₂ | 2.01E+00 | 8.78E-02 | 3.37E-01 | 2.43E+00 | 1.03E-02 | 4.21E-03 | 7.85E-01 | 4.10E-01 | -2.67E+00 |
| GWP-fossil | eq. kg CO ₂ | 1.99E+00 | 8.77E-02 | 3.36E-01 | 2.42E+00 | 1.03E-02 | 4.21E-03 | 7.85E-01 | 3.41E-02 | -2.66E+00 |
| GWP-biogenic | eq. kg CO ₂ | 1.56E-02 | 7.73E-05 | 8.49E-04 | 1.65E-02 | 2.23E-06 | 3.22E-06 | 2.18E-05 | 3.77E-01 | -1.43E-02 |
| GWP-luluc | eq. kg CO ₂ | 1.61E-04 | 4.40E-05 | 5.69E-05 | 2.62E-04 | 1.16E-06 | 2.05E-06 | 2.47E-06 | 1.23E-05 | -8.12E-04 |
| ODP | eq. kg CFC 11 | 3.46E-08 | 1.91E-09 | 6.85E-09 | 4.34E-08 | 1.64E-10 | 9.55E-11 | 2.47E-10 | 2.05E-10 | -1.27E-08 |
| AP | mol H ⁺ | 7.35E-03 | 1.91E-04 | 6.91E-04 | 8.23E-03 | 9.54E-05 | 1.04E-05 | 1.03E-04 | 9.73E-05 | -1.97E-02 |
| EP-freshwater | eq. kg P | 1.11E-04 | 6.34E-06 | 7.10E-05 | 1.88E-04 | 3.16E-07 | 3.10E-07 | 1.11E-06 | 8.69E-06 | -3.22E-03 |
| EP-marine | eq. kg N | 1.15E-03 | 4.79E-05 | 1.64E-04 | 1.36E-03 | 4.42E-05 | 2.84E-06 | 5.38E-05 | 1.07E-03 | -2.77E-03 |
| EP-terrestrial | eq. mol N | 1.22E-02 | 4.86E-04 | 1.53E-03 | 1.42E-02 | 4.81E-04 | 2.91E-05 | 5.21E-04 | 2.79E-04 | -2.43E-02 |
| POCP | eq. kg NMVOC | 6.51E-03 | 2.95E-04 | 7.40E-04 | 7.55E-03 | 1.42E-04 | 1.70E-05 | 1.30E-04 | 2.06E-04 | -7.03E-03 |
| ADP-minerals & metals | eq. kg Sb. | 2.02E-06 | 3.02E-07 | 9.66E-07 | 3.28E-06 | 3.69E-09 | 1.20E-08 | 2.20E-08 | 3.61E-08 | -1.09E-05 |
| ADP-fossil | MJ | 4.95E+01 | 1.25E+00 | 4.71E+00 | 5.55E+01 | 1.36E-01 | 6.43E-02 | 7.77E-02 | 2.00E-01 | -3.04E+01 |
| WDP | eq. m ³ | 1.52E+00 | 6.30E-03 | 2.10E-02 | 1.55E+00 | 3.36E-04 | 3.30E-04 | 1.87E-02 | 1.79E-03 | -5.79E-01 |
| ADDITIONAL IMPACTS | | | | | | | | | | |
| PERE | MJ | 4.33E-01 | 2.02E-02 | 7.76E-01 | 1.23E+00 | 7.67E-04 | 9.34E-04 | 2.06E-03 | 9.02E-03 | -2.91E+00 |
| PERM | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| PERT | MJ | 4.33E-01 | 2.02E-02 | 7.76E-01 | 1.23E+00 | 7.67E-04 | 9.34E-04 | 2.06E-03 | 9.02E-03 | -2.91E+00 |
| PEN-RE | MJ | 4.43E+01 | 1.14E+00 | 4.50E+00 | 5.00E+01 | 1.23E-01 | 5.87E-02 | 7.40E-02 | 1.86E-01 | -3.02E+01 |
| PENRM | MJ | 5.19E+00 | 1.08E-01 | 2.08E-01 | 5.50E+00 | 1.24E-02 | 5.58E-03 | 3.72E-03 | 1.38E-02 | -2.17E-01 |
| PENRT | MJ | 4.95E+01 | 1.25E+00 | 4.71E+00 | 5.55E+01 | 1.36E-01 | 6.43E-02 | 7.77E-02 | 2.00E-01 | -3.04E+01 |
| SM | MJ | 1.04E-02 | 1.42E-03 | 8.91E-03 | 2.08E-02 | 7.84E-05 | 6.44E-05 | 2.50E-04 | 2.62E-04 | -1.65E-01 |
| RSF | MJ | 5.57E-03 | 3.95E-04 | 4.48E-03 | 1.04E-02 | 8.65E-06 | 1.57E-05 | 1.43E-05 | 8.41E-05 | -9.37E-02 |
| NRSF | MJ | 7.83E-03 | 9.22E-04 | 6.54E-03 | 1.53E-02 | 2.34E-05 | 3.26E-05 | 5.81E-05 | 2.32E-04 | -3.23E-01 |
| FW | m ³ | 3.54E-02 | 1.54E-04 | 1.59E-03 | 3.71E-02 | 7.27E-06 | 8.58E-06 | 2.48E-04 | 1.77E-04 | -8.06E-02 |

| ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES | | | | | | | | | | |
|---|-------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|
| HWD | kg | 2.44E-02 | 1.18E-03 | 4.58E-03 | 3.01E-02 | 1.13E-04 | 6.03E-05 | 6.71E-03 | 4.52E-04 | -9.11E-02 |
| NHWD | kg | 1.63E-02 | 5.86E-02 | 1.41E-02 | 8.91E-02 | 8.36E-05 | 5.54E-03 | 7.73E-03 | 5.88E-01 | -1.02E-01 |
| RWD | kg | 5.80E-06 | 4.28E-07 | 7.01E-07 | 6.93E-06 | 1.48E-08 | 1.95E-08 | 2.57E-08 | 1.72E-07 | -2.16E-05 |
| CRU | kg | -1.63E-22 | -1.05E-27 | -4.28E-22 | -5.91E-22 | -1.04E-24 | -1.22E-24 | -3.64E-24 | 5.28E-23 | -2.67E-21 |
| MFR | kg | 9.94E-03 | 1.29E-03 | 8.53E-03 | 1.98E-02 | 6.45E-05 | 5.54E-05 | 1.09E-04 | 2.01E-04 | -1.60E-01 |
| MER | kg | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EEE | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| EET | MJ | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ADDITIONAL ENVIRONMENTAL IMPACTS INDICATORS | | | | | | | | | | |
| PM | Disease incidence | 7.85E-08 | 6.36E-09 | 4.10E-09 | 8.90E-08 | 2.66E-09 | 4.16E-10 | 5.02E-10 | 1.30E-09 | -3.49E-08 |
| IRP | eq. kBq U235 | 2.27E-02 | 1.76E-03 | 2.85E-03 | 2.73E-02 | 6.40E-05 | 8.05E-05 | 1.03E-04 | 7.06E-04 | -8.80E-02 |
| ETP-fw | CTUe | 5.05E+00 | 6.19E-01 | 5.32E-01 | 6.20E+00 | 6.44E-02 | 3.07E-02 | 3.88E+00 | 1.41E+00 | -8.72E+00 |
| HTP-c | CTUh | 3.85E-10 | 4.05E-11 | 9.42E-11 | 5.20E-10 | 3.16E-12 | 1.88E-12 | 5.17E-11 | 1.78E-11 | -1.13E-09 |
| HTP-nc | CTUh | 4.29E-09 | 8.88E-10 | 2.07E-09 | 7.25E-09 | 2.21E-11 | 4.60E-11 | 2.00E-09 | 8.08E-10 | -5.24E-08 |
| SQP | dimensionless | 4.44E-01 | 7.30E-01 | 6.28E-01 | 1.80E+00 | 9.05E-03 | 6.48E-02 | 2.03E-02 | 3.50E-01 | -6.67E+00 |

Table 6.4 : Conversion factors for other thicknesses of insulation boards

| Thickness [m] | 0.01 | 0.012 | 0.015 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.05 |
|-------------------|------|-------|-------|------|-------|------|-------|------|------|
| Conversion factor | 0.33 | 0.40 | 0.50 | 0.67 | 0.83 | 1.00 | 1.17 | 1.33 | 1.67 |

7. REFERENCES

- EN 15804+A2:2019 Sustainability of construction works -- Environmental product declarations -- Core rules for the product category of construction products;
- EN 16783 Thermal insulation products – Environmental Product Declarations (EPD) – Product Category Rules (PCR) complementary to EN 15804 for factory made and in-situ formed products;
- ISO 14025:2010 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures;
- ISO 14044:2009 Environmental management -- Life cycle assessment -- Requirements and guidelines;
- EN 15942:2012 Sustainability of construction works -- Environmental product declarations -- Communication format business-to-business;
- ISO 14067:2018 Greenhouse gases -- Carbon footprint of products -- Requirements and guidelines for quantification;
- ISO 21930:2017 Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services;
- EN 13163:2012+A1:2015 Thermal insulation products for buildings -- Factory made expanded polystyrene (EPS) products – Specification;
- Ecoinvent 3.9 database



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CERTIFICATE No. 2024-0067-1

of TYPE III ENVIRONMENTAL DECLARATION

Product:

Insulation boards:

- IZOROL-L
- IZOROL-PP
- IZOROL-SR
- IZOROL-SR/KL

Manufacturer:

KOTAR Sp. z o.o.
ul. Tadeusza Kościuszki 33; 56-100 Wołów
NIP: 917-000-27-93

confirms the correctness of the data included in the development of the Type III Environmental Declaration and accordance with the requirements of the standard:

EN 15804:2012+A2:2019

Sustainability of construction works --
Environmental product declarations --
Core rules for the product category of construction products

This certificate, issued for the first time on 14/02/2025 and is valid for 5 years or until amendment of mentioned Environmental Declaration.



Director of the Certification
Department
CERTBUD Sp. z o.o.

Kamil PAWŁOWSKI

Warsaw, 14/02/2025