EPD®

Cendec®

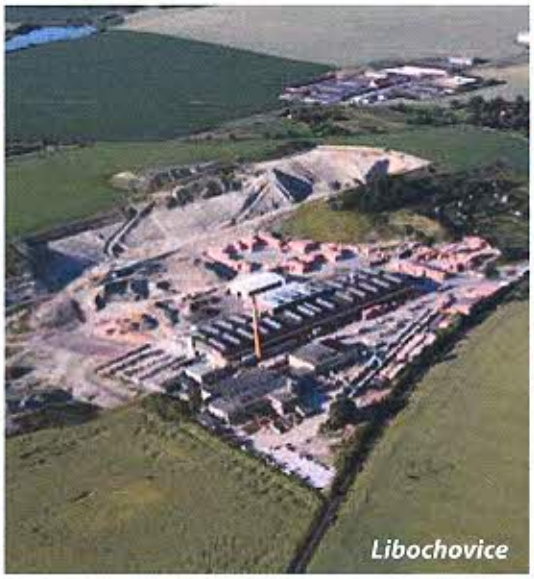
ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN 15804 for:

Hollow bricks and brick products

HELUZ cihlářský průmysl, v. o. s.

HELUZ®



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Programme operator:	EPD International AB
EPD registration number:	S-P-00750 3013EPD-15-0311
Approval date:	2015-09-07
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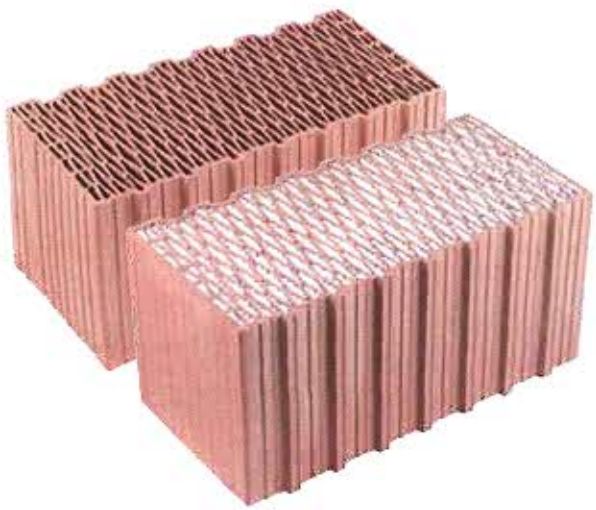
Geographical scope:	Europe



1 COMPANY

The hollow bricks HELUZ is produced in HELUZ cihlářský průmysl v. o. s., 373 65 Dolní Bukovsko 295, Czech Republic. Registration No. / VAT No.: 466 80 004/ CZ46680004. The company is recorded in the Company Register kept by the Regional Court in České Budějovice, Section České Budějovice, File 1867. The record in the Company Register (22. 5. 1992) was ordered by the District Court in České Budějovice. Tel.: +420 389 018 111, fax: +420 386 354 309, **http://www.heluz.cz/**

The company of HELUZ cihlářský průmysl v. o. s. produces a complex range of brick products which can be further used for rough constructions. At current times, the company has its manufacturing facilities in three locations. There is a brick production plant in Dolní Bukovsko where the company's headquarter can be also find. This plant includes facilities for brick production, production of horizontal structures and production of roller blind lintels and chimney systems. In Hevlín, there are two production plants for complete range of brick products. Brick-kiln of Hevlín II is one of the most advanced manufacturing plants in Europe which is furnished with advanced technology; there are brick blocks which have the best thermal and insulation characteristics produced right here. In the brick-kiln of Libochovice, there is a production facility for brick blocks, accessories and also ceramic ceiling panels of HELUZ. The company of HELUZ cihlářský průmysl v. o. s. sell its goods to foreign markets too - Slovakia, Austria, Germany, Poland and Hungary and offer following categories of brick:

HELUZ FAMILY and **HELUZ FAMILY 2in1**: Unique news on Czech market used for passive and low-energy building without necessary thermal insulation. Passive and low-energy house.

HELUZ STI: Brick blocks of STI quality which comply with parameters of energy saving and low-energy buildings.

HELUZ AKU: Acoustic bricks for housing development.

HELUZ PLUS, **HELUZ P15** and **HELUZ** are brick blocks for internal and external masonry that will be additionally insulated.

2 PRODUCT

Declared unit	1 000 kg of burnt bricks
UN CPC	3731: Bricks, blocks, tiles and other ceramic goods of siliceous earths

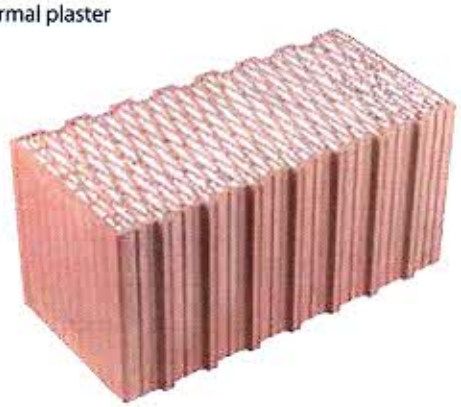
The hollow brick HELUZ is a brick for general masonry use it can be used for load bearing, non load bearing and acoustic masonry. Especially it can be used for one layer thermal insulated masonry, that reach U - value 0,15 W/m²K. This EPD covers all HELUZ brick production with the same composition. Differences are only in shape and volume of bricks. Material and energy consumption of production is only product weight depended. As this EPD is based on declaration unit which is 1000 kg of product, environmental data shown below are valid for all bricks.

This EPD is valid for in tables below summarized HELUZ bricks:

Plants Hevlín

Trademark	Type	Width	Weight/ pcs	Weight/ m²	U - Value	Recommended use
		cm	*kg*	*kg*	*W/m²K*	
HELUZ Family 2in1	calibrated	50	20,0	320	0,11	A, B, C
		44	17,6	281	0,13	A, B, C
		38	15,5	243	0,16	A, B, C
		30	12,5	201	0,22	A, B, C
		25	10,3	162	0,31	B, C
HELUZ Family	calibrated	50	19,7	315	0,15	A, B, C
		44	17,3	277	0,18	A, B, C
		38	15,0	239	0,21	A, B, C
		30	12,4	198	0,26	A, B, C
		25	10,1	162	0,35	B, C
HELUZ STI	calibrated	49	18,1	289	0,19	A, B, C
		44	15,7	251	0,2	A, B, C
		40	14,3	228	0,22	A, B, C
		38	13,8	221	0,23	A, B, C
HELUZ STI		44	15,0	240	0,20	A, B, C

Expected service life time is 100 years.
U - Value - design value without plaster except of category of use A, there is a design value with thermal plaster
A - One layer thermal insulating masonry
B - Load bearing masonry
C - Non load bearing masonry
D - Acoustic masonry



Trademark	Type	Width	Weight/ pcs	Weight/ m²	U - Value	Recommended use
		cm	*kg*	*kg*	*W/m²K*	
HELUZ Plus	calibrated	44	16,2	260	0,22	A, B, C
		40	14,8	236	0,24	A, B, C
		38	13,9	222	0,25	A, B, C
		36,5	13,5	216	0,29	B, C
		30	13,1	210	0,53	B, C
		25	15,4	165	0,49	B, C
HELUZ Plus		44	15,5	248	0,23	A, B, C
		40	14,1	226	0,25	A, B, C
		38	13,3	213	0,29	B, C
		36,5	12,9	206	0,30	B, C
		30	12,5	200	0,61	B, C
		25	14,7	158	0,50	B, C
HELUZ P15	calibrated	30	12,9	207	0,53	B, C
		25	17,3	185	0,87	B, C
		20	17,6	141	1,11	B, C
HELUZ P15		30	12,3	198	0,61	B, C
		25	16,5	177	0,93	B, C
		20	16,8	134	1,17	B, C
HELUZ	calibrated	24	14,7	158	0,88	B, C
		20	16,3	131	1,00	B, C
		17,5	14,7	118	1,11	B, C
		14	11,6	93	1,29	B, C
		11,5	10,3	83	1,46	C
		10	10,0	80	1,59	C
		8	5,3	57	1,80	C
HELUZ		24	14,0	151	0,94	B, C
		20	15,6	125	1,08	B, C
		17,5	14,1	113	1,18	B, C
		14	11,1	89	1,37	B, C
		11,5	9,9	79	1,55	C
		10	9,5	76	1,68	C
		8	5,0	54	1,90	C

Expected service life time is 100 years.
U - Value - design value without plaster except of category of use A, there is a design value with thermal plaster
A - One layer thermal insulating masonry
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D - Acoustic masonry

Trademark	Type	Width	Weight/ pcs	Weight/ m²	SRI - R_w	Recommended use
		cm	*kg*	*kg*	*dB*	
HELUZ AKU	MK	36,5	20,2	323	58	B, C, D
	30/333 MK	30	21,3	256	58	B, C, D
	30/333	30	23,3	280	56	B, C, D
	MK	25	20,2	216	56	B, C, D
		20	18,2	195	53	B, C, D
	MK	17,5	15,1	162	53	B, C, D
		11,5	11,0	118	47	C, D

Plants Libochovice

Trademark	Type	Width	Weight/ pcs	Weight/ m²	U - Value	Recommended use
		cm	*kg*	*kg*	*W/m²K*	
HELUZ Family	calibrated	44	19,5	312	0,17	A, B, C
		38	16,8	269	0,21	A, B, C
		30	13,3	213	0,29	A, B, C
		25	11,5	185	0,35	B, C
HELUZ STI	calibrated	49	18,7	299	0,17	A, B, C
		44	16,8	268	0,19	A, B, C
		40	16,0	256	0,20	A, B, C
HELUZ STI		44	16,0	257	0,20	A, B, C
HELUZ Plus	calibrated	44	17,6	281	0,21	A,B,C
		40	15,3	244	0,23	A,B,C
		36,5	14,4	230	0,25	A,B,C
		30	13,7	218	0,58	B,C
		25	15,4	165	0,49	B,C
HELUZ Plus		44	16,8	269	0,22	A,B,C
		40	14,6	233	0,24	A,B,C
		36,5	13,7	220	0,29	B,C
		30	13,1	209	0,66	B,C
		25	14,7	158	0,50	B,C

Expected service life time is 100 years.
U - Value - design value without plaster except of category of use A, there is a design value with thermal plaster
A - One layer thermal insulating masonry
B - Load bearing masonry
C - Non load bearing masonry
D - Acoustic masonry

Trademark	Type	Width	Weight/ pcs	Weight/ m^2	U - Value	Recommended use
		cm	*kg*	*kg*	*W/m²K*	
HELUZ P15	calibrated	30	15,1	242	0,53	B,C
		25	19,1	205	0,87	B,C
HELUZ P15		30	14,5	231	0,61	B,C
		25	18,3	196	0,93	B,C
HELUZ	calibrated	24	16,2	175	0,85	B,C
		20	17,1	137	0,98	B,C
		17,5	15,4	123	1,08	B,C
		14	11,4	91	1,26	B,C
		11,5	10,5	84	1,43	C
		8	5,3	57	1,77	C
HELUZ		24	15,5	168	0,92	B,C
		20	16,3	131	1,05	B,C
		17,5	14,7	118	1,08	B,C
		14	10,9	87	1,35	B,C
		11,5	10,1	81	1,52	C
		8	5,0	54	1,87	C

Trademark	Type	Width	Weight/ pcs	Weight/ m^2	SRI - R_w	Recommended use
		cm	*kg*	*kg*	*dB*	
HELUZ AKU	MK	36,5	20,2	323	58	B, C, D
	30/333 MK	30	21,3	256	58	B, C, D
	30/333	30	23,3	280	56	B, C, D
	MK	25	20,2	216	56	B, C, D
		20	18,2	195	53	B, C, D
	MK	17,5	15,1	162	53	B, C, D
		11,5	11,0	118	47	C, D

Expected service life time is 100 years.
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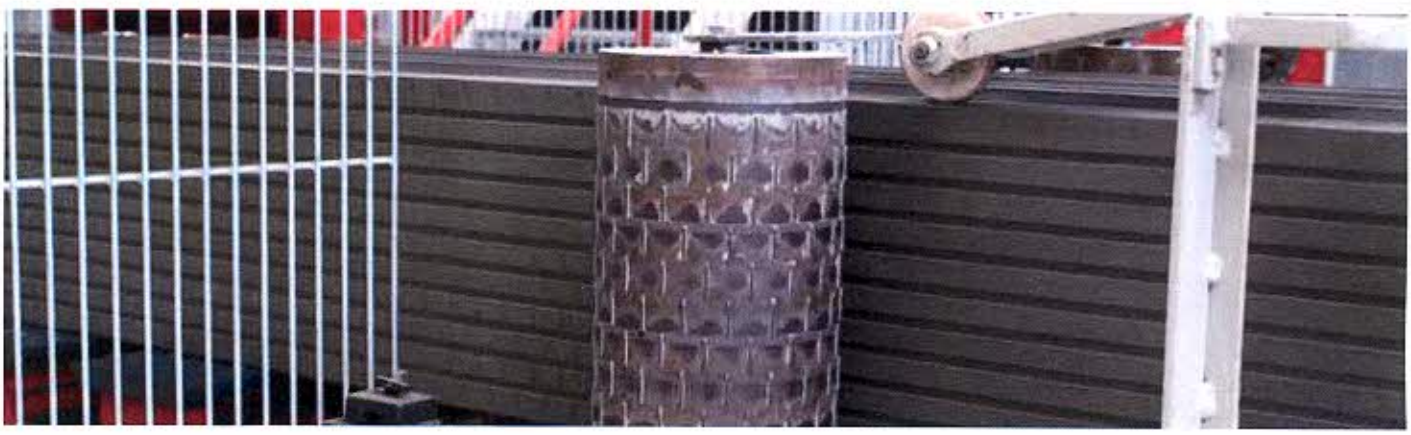


Plants Dolní Bukovsko

Trademark	Type	Width	Weight/ pcs	Weight/ m²	U - Value	Recommended use
		cm	*kg*	*kg*	*W/m²K*	
HELUZ Plus	calibrated	44	18,4	294	0,32	A,B,C
		40	16,2	260	0,34	A,B,C
		30	14,9	239	0,59	B,C
		25	18,2	195	0,67	B,C
HELUZ Plus		44	17,6	281	0,31	A,B,C
		40	15,5	248	0,33	A,B,C
		30	14,3	229	0,65	B,C
		25	17,4	186	0,75	B,C
HELUZ P15	calibrated	30	17,9	286	0,62	B,C
		25	22,6	242	0,94	B,C
HELUZ P15		30	17,1	274	0,68	B,C
		25	21,6	232	0,99	B,C
HELUZ	calibrated	24	17,3	187	0,92	B,C
		20	18,6	149	1,05	B,C
		17,5	16,2	130	1,15	B,C
		14	13,0	104	1,34	B,C
		11,5	11,4	91	1,52	C
		8	6,0	65	1,85	C
HELUZ		24	16,6	179	0,98	B,C
		20	17,7	142	1,12	B,C
		17,5	15,5	124	1,22	B,C
		14	12,4	99	1,42	B,C
		11,5	10,9	87	1,60	C
		8	5,7	62	1,94	C

Expected service life time is 100 years.
U - Value - design value without plaster except of category of use A, there is a design value with thermal plaster
A - One layer thermal insulating masonry
B - Load bearing masonry
C - Non load bearing masonry
D - Acoustic masonry

SYTEM BOUNDARY and PRODUCTION PROCESS

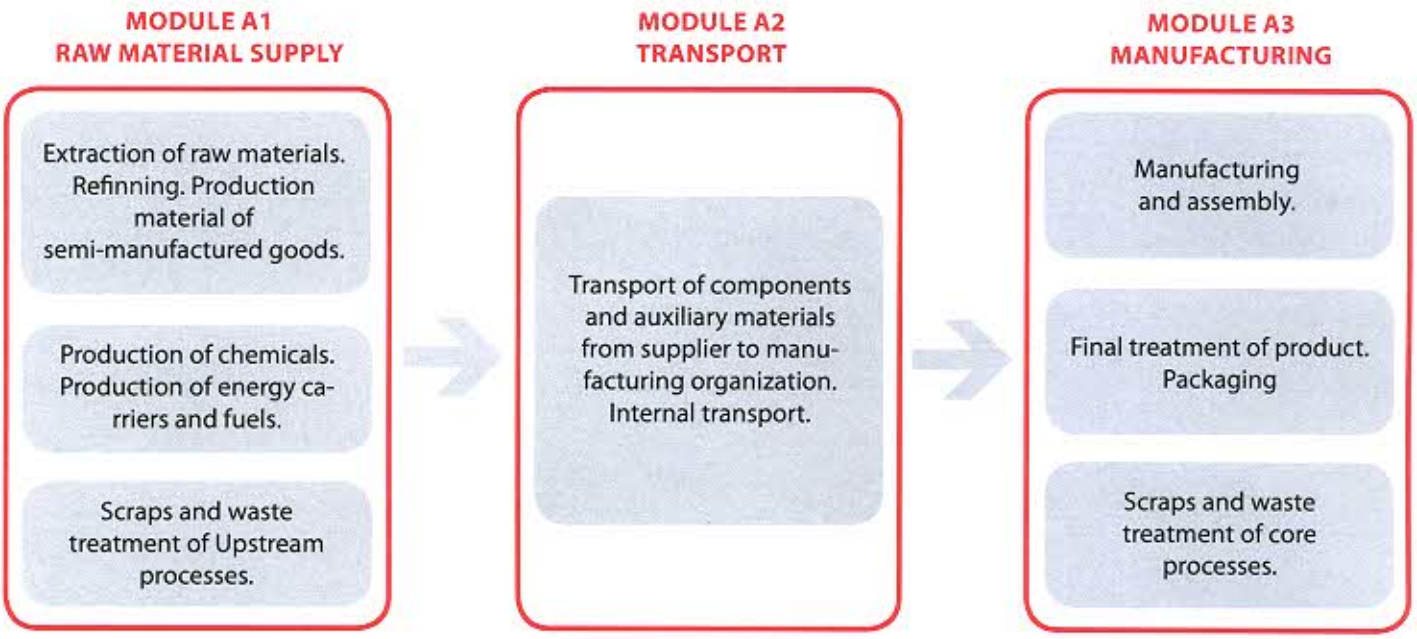
The system boundary covers the production of raw materials, all relevant transport down to factory gate and manufacturing by HELUZ cihlářský průmysl v. o. s. Cradle to gate EPD). Production stages start with yielding of clay raw material in own surface mines. Pretreated clay raw material is mixed with additional mixture of pulp sludges, straw and wooden sawdust. After alteration of mixture material with appropriate amount of water the pressing of bricks to final shape and burning in kiln takes a place. In the case of 2in1 type of bricks filling of hollows with expandable polystyrene is realized. Final product is packed using polyethylene.

The review framework comprises the following details:

- Raw materials acquisition and transport,
- Further processing of raw materials,
- Production operations,
- Energy and water consumption,
- Waste management; and
- Packaging of the final product for delivery.

The system boundary of the LCA study conducted on the Heluz burnt bricks products is shown including packaging of the final product for delivery.

System Boundary of the LCA study conducted on Heluz burnt bricks



Description of the system boundary (D = Declared, Included in LCA, MND = Module Not Declared)

A1 - A3 Product stage	Raw material supply	A1	D
	Transport	A2	D
	Manufacturing	A3	D
A4 - A5 Construction process	Transport from the gate to the site	A4	MND
	Assembly	A5	MND
B1 - B7 Use stage	Use	B1	MND
	Maintenance	B2	MND
	Repair	B3	MND
	Replacement	B4	MND
	Refurbishment	B5	MND
	Operational water use	B6	MND
	Operational energy use	B7	MND
C1 - C4 End of life stage	De-construction	C1	MND
	Transport	C2	MND
	Waste processing	C3	MND
	Disposal	C4	MND
D Benefits and loads beyond the system boundaries	Reuse- Recycling - Recovery Potential	D	MND

3 CONTENT DECLARATION

The Heluz burnt brick have siliceous heart and are made from clay minerals. All of the constituents of burn bricks materials are not classified as harmful.

Product content declaration

All materials/ components	Substances	Weight %	CAS number	Environmental class	Health class
Clay minerals	-	99,6%	-	No	No
Ash from wooden sawdust and straw	-	0,4%	-	No	No

4 ENVIROMENTAL PERFORMANCE

Results per declared unit – 1000 kg of burn bricks.

USE OF RESOURCES

Indicators for the Life Cycle Analysis as per ISO 14025 and EN15804

The results of the LCA with the indicators as per EPD requirement are given in the following tables for product manufacture (A1-A3). The system boundaries in tabular form for all modules are shown in the table above. Life Cycle Inventory Analysis indicators describing the use of resources are shown below.

Resource consumption	Dolní Bukovsko	Hevlín I	Hevlín II	Libochovice	Family 2in1	Average of Heluz production
Crude oil (in MJ)	4,90	4,93	3,60	3,77	3,85	4,40
Hard coal (in MJ)	4,88	5,21	3,35	4,44	3,38	4,59
Lignite (in MJ)	36,5	40,9	24,8	32,0	24,9	34,8
Natural gas (in MJ)	37,8	38,1	27,7	53,3	30,3	39,2
Iron	0,227	0,163	0,228	0,125	0,232	0,180
Clay	1102	1047	1082	1161	1067	1088
Inert rock	482	543	330	425	332	462
Limestone (calcium carbonate)	1,58	1,51	1,47	1,24	1,48	1,46
Natural Aggregate	28,3	20,3	20,5	7,4	20,3	19,0
Sodium chloride (rock salt)	0,206	0,156	0,162	0,137	0,193	0,163

Verified EPD by Independent Third Party Accredited Certification Body
Building Research Institute - Certification Company Ltd.
Czech Republic, Prazska 810/16, 102 21 Praha 10 info@vups.cz www.vups.cz

Parameter	Unit	Dolní Bukovsko	Hevlín I	Hevlín II	Libocho-vice	Family 2in1	Average of Heluz production
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ	6956	5205	4858	443	4798	4417
Use of renewable primary energy resources used as raw materials	MJ	0,00	0,00	0,00	0,00	0,00	0,00
Total use of renewable primary energy resources	MJ	6956	5205	4858	443	4798	4417
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ	2900	2926	2089	3355	3385	2882
Use of non-renewable primary energy resources used as raw materials	MJ	1,2	0,8	0,9	0,6	1,0	0,9
Total use of non-renewable primary energy resources	MJ	2901	2927	2089	3356	3386	2883
Use of secondary material	kg	0,0	0,0	0,0	0,0	0,0	0,0
Use of renewable secondary fuels	MJ	0,0	0,0	0,0	0,0	1,3	0,0
Use of non renewable secondary fuels	MJ	0,0	0,0	0,0	0,0	0,0	0,0
Net use of fresh water	m^3	1,697	1,133	1,359	1,089	3,436	1,345

POTENTIAL ENVIRONMENTAL IMPACTS

Following from A1, A2 and A3 modules aggregated data are per D.U. expressed.

	Unit	Dolní Bukovsko	Hevlín I	Hevlín II	Libocho-vice	Family 2in1	Average of Heluz production
Abiotic depletion potential (elements)	kg Sb eq.	4,19E-05	3,32E-05	3,21E-05	2,99E-05	3,70E-05	3,40E-05
Abiotic depletion potential (fossils)	MJ	2586	2613	1871	3089	3129	2598
Acidification potential	kg SO_2e	0,715	0,839	0,480	0,626	0,641	0,702
Eutrophication potential	kg PO_4^{3-}e	0,088	0,100	0,067	0,072	0,080	0,085
Global warming potential	kg CO_2e (GWP100)	246	313	179	354	226	283
Ozone yayer depletion potential	kg CFC11e	1,11E-06	7,55E-07	8,67E-07	6,03E-07	8,56E-07	8,07951E-07
Photochemical oxidant creation potential	kg C_2H_4e	0,061	0,055	0,027	0,055	0,050	0,051

Following from A1, A2 and A3 modules aggregated data are per D.U. expressed.

OTHER INDICATORS DESCRIBING WASTE CATEGORIES

	Unit	Dolní Bukovsko	Hevlín I	Hevlín II	Libocho-vice	Family 2in1	Average of Heluz production
Non-hazardous waste	kg	12,0	6,4	5,0	6,8	5,0	6,9
Hazardous waste	kg	0,018	0,004	0,123	0,008	0,121	0,059
Radioactive waste	kg	0,00	0,00	0,00	0,00	0,00	0,00

RELEASE OF DANGEROUS SUBSTANCES DURING THE USE STAGE

No health and environmental impacts during use is observed.

Verified EPD by Independent Third Party Accredited Certification Body
Building Research Institute - Certification Company Ltd.
Czech Republic, Prazska 810/16, 102 21 Praha 10 info@vups.cz www.vups.cz

5 ADDITIONAL INFORMATION

The Company of HELUZ cihlářský průmysl v. o. s. operates brick-kiln Hevlín II, which is one of the most advanced manufacturing plants in Europe and is furnished with advanced technology; there are produced brick blocks with the best thermal and insulation characteristics in the central Europe.

This technology allows the most ecological production of brick and the some product obtained an ecological certificate Nature Plus. HELUZ has established and applied a combined management system for development, production, sales and services of its products. An audit was performed, Report No. XXXXX. Proof has been furnished that the requirements according to DIN EN ISO 9001:2000 are fulfilled.

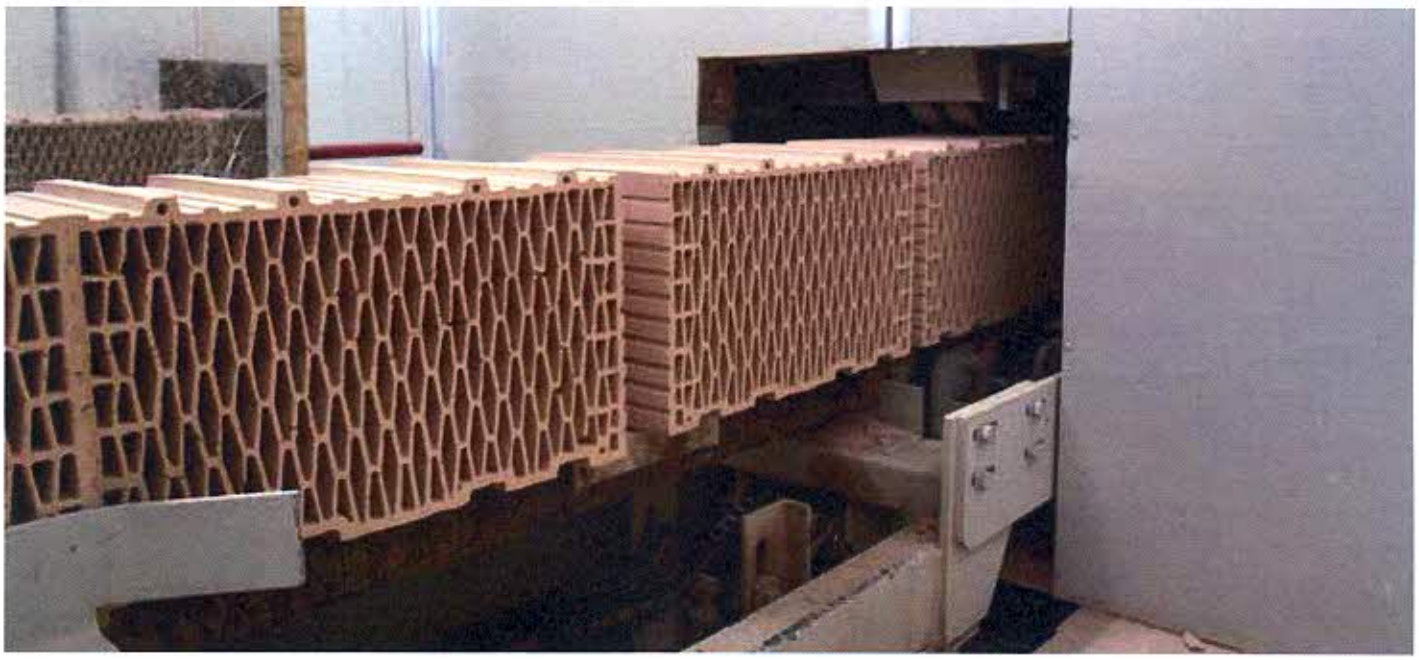
Obtained certificates EN ISO 9001, and the commitment of whole company´s staff to quality give the customers a guarantee of a standard quality of products.

For recommended use of HELUZ product follow **http://www.heluz.cz**.
After the end of life it is possible to deposit separated clay on a dump for inert waste.

6 PROGRAMME-RELATED INFORMATION AND VERIFICATION

See PCR for detailed requirements.

Programme:	The International EPD® System EPD International AB Box 210 60 SE-100 31 Stockholm Sweden **www.environdec.com**
EPD registration number:	S-P-00750
Published:	2015-09-07
Valid until:	2020-09-07
Revision date:	
Product Category Rules:	PCR 2012:01. Product group classification: Multiple UN CPC Codes, Construction products and construction services. Version 2.0
Product group classification:	UN CPC 3731: Bricks, blocks, tiles and other ceramic goods of siliceous earths
Reference year for data:	2013, 2014
Geographical scope:	Europe



Product category rules (PCR): EPD International AB, Sweden PCR moderator: *Martin Erlandsson, IVL Swedish Environmental Research Institute, Sweden* *(e-mail: martin.erlandsson@ivl.se)*
PCR review was conducted by: *The International EPD® System Technical Committee*
Independent verification of the declaration and data, according to ISO 14025:2006: ☐ EPD Process Certification (internal) ☒ EPD Verification (external)
Third party verifier: *Barbora Vlasatá, Certification Body for EPD* *VÚPS – Certifkační společnost, s. r. o.* *Pražská 16, 102 21 Praha 10, Czech Republic* *www.vups.cz* Accredited by: Český institute pro akreditaci, *www.cia.cz*

MANDATORY STATEMENTS

The LCA for this EPD is conducted according to the guidelines of ISO 14040-44, the requirements given in the Product Category Rules (PCR) document for Construction Products and CPC 54 Construction Services (PCR 2012:01 Version 2.0, 2015-03-03), EN 15804+ A1:2013 Sustainability of Construction Works: Environmental Product Declarations and the general program guidelines by The International EPD System in accordance with ISO 14025 standards.

The inventory for the LCA study is based on the 2013 and 2014 production. Production plants are located in Dolní Bukovsko, Libochovice and Hevlín in Czech Republic. LCA study used for development of this declaration was modeled using GaBi software with the latest version characterization factors (April 2013) and the Ecoinvent database.

EPD of construction products may not be comparable if they do not comply with EN 15804.

This EPD covers the Cradle to Gate stage and disposal option.

The EPD certificate, its background data and the results will be used for business-to-business communications and is expected to be a reliable document for green building designers, architectures, manufacturers of construction products and the other stakeholders in the construction sector to understand the potential environmental impacts caused by in HELUZ cihlářský průmysl, v.o.s.

"EPDs within the same product category but from different programmes may not be comparable"

CONTACT INFORMATION:

EPD owner:	HELUZ® Skvělé cihly pro Váš dům HELUZ cihlářský průmysl v. o. s., Dolní Bukovsko 295, 373 65 České Budějovice, Czech Republic, **www.heluz.cz** Contact person: Ing. Miroslav Vacek, PhD.	
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