ENVIRONMENTAL DECLARATION

Number	001.01/16
Supplier	**CINCA - Companhia Industrial de Cerâmica, S.A.**
Address	Rua Principal, 39 – Apartado 12 4509-908 Fiães **PORTUGAL**
Phone	(+351) 227.476.400
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1 Generic Data

1.1 Company

CINCA - Companhia Industrial de Ceramica, SA, is a company with headquarters in Portugal, in the county of Santa Maria da Feira, and started its business with the production of small porcelain mosaics with measures of 2,5x2,5cm in response to the needs of architects, builders and consumers in Portugal.

Currently with a total of around 450 employees at its service, CINCA has several different production units, dedicated to the production of glazed and unglazed floor tiles, including large format porcelain tiles, and also of double firing, white body, ceramic wall tiles.

The quality of the products has always been the main concern for CINCA. Whatever the purpose of the tiles, they are always made with the finest raw materials purchased from the market leaders. CINCA wall and floor tiles are manufactured exclusively with white body and meet the most strict international quality norms.

CINCA keeps a close collaboration with world renowned design offices, and can so meet the new preferences of customers and simultaneously the needs of both the architects and planners, always looking for new colors and new combinations of products. The CINCA range, with its great variety and flexibility, allows any client to find the best solution for the refurbishment of their spaces.

1.2 Contacts

General	
Postal Address	Rua Principal, n.º 39 - Apartado 12 4509-908 Fiães VFR PORTUGAL
Phone	(+351) 227 476 400
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1.3 Product

CINCA designs, develops, manufactures and sells wall and floor tiles for internal and external use. The different products that are manufactured are classified in various types and various norms, depending on different applications. The required norm, resulting from the application of the **Regulation (EU) No. 305/2011**, is as follows:

- **EN 14411 Ceramic tiles - Definitions, classification, characteristics and marking**. Refers to the classification and marking of products and packaging as well as manufacturing specifications to which the products are obliged according to the referred classification (or typology) of the product.
- **EN ISO 10545, Parts 1 to 16**. Refers to the test methods which should be used for inherent determinations to the various technical characteristics described in EN 14411.

CINCA product's fall within the following group standards:

Product Type	Production Unit	Way of production	Standard Group
Glazed and Unglazed Floor Tiles	Fiães I Fiães II Fiães III	Dry pressed and single fired	Group Bla EN 14411 Annex G Group Blb EN 14411 Annex H
Glazed Wall Tiles ***(NOT COVERED BY THIS DECLARATON)***	*Mealhada* *Ílhavo*	*Dry pressed and double fired*	*Grupo BIII* *EN 14411 Annex K*

The present Environmental Declaration is issued regarding the following products:

Product Identification	**Glazed or Unglazed Dry Pressed Ceramic Tiles**, with water absorption **Eb ≤ 0,5% (EN 14411:2012 - Group Bla)** or water absorption between **0,5% < Eb ≤ 3% (EN 14411:2012 - Group Blb)**, in accordance to CINCA catalogues in force at the date of this statement. For the information about the range, size, reference and batch please refer to the marks on the boxes.
Intended Use	Ceramic tiles for wall and floor finishes, interiors and exteriors, excluding the use as wall coverings when subject to specific regulations on hazardous substances (ex: when glazed products are used on surfaces where they have direct contact with food).
System of Assessment	System 4 in accordance to Annex V, section 1.5 of the Regulation (EU) No. 305/2011 of the European Parliament and of the Council of 9th of March 2011.
Harmonized Standard	**EN 14411:2012** Group Bla and Group Blb

Essential Characteristics	Performance	Test Standard	Harmonized Technical Specification
Reaction to Fire	Class A1 / $A1_{FL}$	CWT (Dec. 96/603/EC)	EN 14411:2012
Release of Dangerous Substances, for (only glazed products): - Cadmium - Lead	 ≤ 0,005 mg/dm² ≤ 0,05 mg/dm²	 EN ISO 10545-15 EN ISO 10545-15	
Breaking Strength, for: - Thickness ≥ 7,5 mm - Thickness < 7,5 mm	 ≥ 1100 N ≥ 700 N	 EN ISO 10545-4 EN ISO 10545-4	
Bond Strength / Adhesion, for: - Cementitious Adhesives (Type C2) - Dispersion Adhesives (Type D1) - Reaction Resin Adhesives (Type R2) - Mortar	See Note (1) > 1 N/mm² > 1 N/mm² > 2 N/mm² NPD	 EN 12004 4.1 EN 12004 4.2 EN 12004 4.3 EN 1015-12	
Thermal Shock Resistance	Pass	EN ISO 10545-9	
Slipperiness, for: - Barefoot (Ramp Test, Annex A) - Shod (Ramp Test, Annex B)	 See Annex PH-GL See Annex PH-GL	 CEN/TS 16165 CEN/TS 16165	
Tactility	NPD	CEN/TS 15209	
Durability, for: - Internal Uses: - External Uses: Freeze-thaw Resistance	 Pass Pass	 - EN ISO 10545-12	

Note (1): The laboratorial determination regarding the adhesion of ceramic tiles to mortar / cement glue is merely indicative and relevant only under certain specific circumstances, namely, according to the harmonized standard, "*only when the tile is used on walls subject to requisites against the fall of objects in trafficable areas.*". The results obtained and declared are a result of tests carried out under ideal laboratorial conditions, and therefore a correlation between the declared adhesion results and the performance of the tile in use may not exist, since application techniques and the different types of support can strongly influence the final performance.

Note (2): Under Regulation (EC) No. 1907/2006 of the European Parliament and of the Council of 18th of December 2006 (REACH), article 3, number 3, floor and wall tiles are considered articles and are not expected to release any substances when used in normal and reasonably predicted conditions, reason why any safety data sheet for its fixing, transport or use in the market, is not necessary.

Note (3): Wall and floor tiles are not classified as hazardous according to the Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16th of December 2008.

1.4 Materials Identification

1.4.1 Materials and Chemical Substances

Ceramic tiles are produced from a blend of natural raw materials, in its majority, and small quantities of treated raw materials in the following general percentages:

Clay / Kaolin: 50 to 70%

Clay is a fine-grained natural rock or soil material that combines one or more clay minerals with traces of metal oxides and organic matter, mostly composed of phyllosilicate minerals containing variable amounts of water trapped in the mineral structure. Clays are extracted in natural occurring mineral deposits.

Kaolin, also known has China Clay, are rocks rich in kaolinite which is a silicate mineral, part of the group of industrial minerals, with the chemical composition $Al_2Si_2O_5(OH)_4$.

Feldspar: 10 to 30%

Feldspar is the name given to a group of minerals distinguished by the presence of alumina and silica in their chemistry. This group includes aluminum silicates of soda, potassium, or lime. It is the single most abundant mineral group on Earth.

Sand: Up to 20%

Sand is composed of finely divided rock and mineral particles. The composition of sand varies but the most common constituent of sand silica (silicon dioxide, or SiO_2), usually in the form of quartz, having as a second most present constituent calcium carbonate resulting from the fine division of limestone.

Glazes & Dyes: Up to 5%

A mixture of clays, kaolins and glass frits mostly constitutes the formers. A glass frit is a ceramic composition that has been fused in a special fusing oven, and then granulated. The purpose of the pre-fusion is to render any soluble and/or toxic components insoluble by causing them to combine with silica and other added oxides.

Dyes, in other hand, is a colored substance which is normally added to the body of the ceramic product to give it a specific color. Dyes or pigments are also added to ceramic inks used in specific decorations made in the surface of tiles.

1.4.2 Energy

Most of the energy employed in the fabrication of ceramic tiles is expended in the body preparation, namely in size reduction of raw materials, its blending and spray drying, as well as in the firing process.

The spray drying of the body powder, tiles drying after conformation and firing of the ceramic product uses natural gas which accounts for 80 to 85% of all energy used in the production process.

The remaining energy is expended electric energy from external suppliers. In Portugal, more than 60% of the electric supply is obtained from renewable resources like hydroelectric, eolic and biomass.

2 Environmental Data

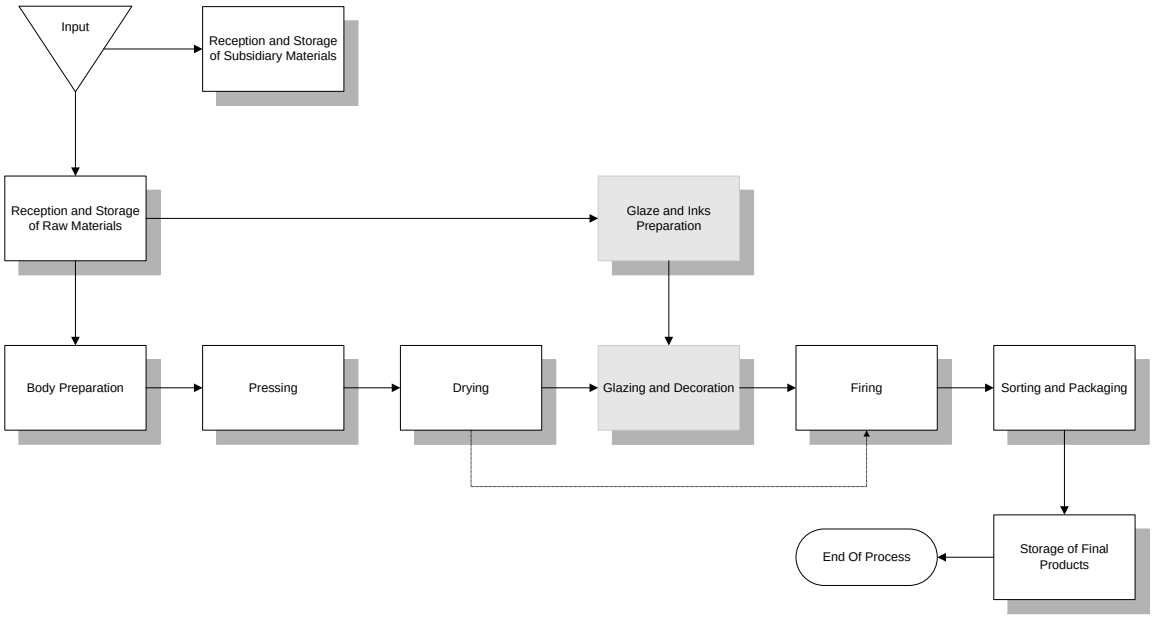
2.1 Metodology

This declaration was prepared according with the requisites of the **EN ISO 14021:2001 + A1:2011** international standard, concerning self-declared environmental claims (type II environmental labeling).

2.2 Functional Unit and System Frontiers

The environmental performance declared refers to 1 m² (one square meter) of finished ceramic floor tile available to purchase at the company premises. The extraction of raw materials and other subsidiaries as well as its transport to the factory were not considered. Also all environmental impacts after production were not considered. This environmental declaration have a “gate to gate” approach.

The generic process flowchart is the following:



2.3 Environmental Impact During Production

The environmental impacts were calculated using the available data for the total production of one year (referenced to 2014) per functional unit:

Air	Lead (Pb)	$1{,}50 \times 10^{-6}$ kg/m²
	Copper (Cu)	$3{,}68 \times 10^{-7}$ kg/m²
	VOC	$2{,}96 \times 10^{-3}$ kg/m²
	CO2	6,32 kg/m²
	Fluor (HF)	$1{,}37 \times 10^{-4}$ kg/m²
	CO	$1{,}18 \times 10^{-2}$ kg/m²
	NOx/NO2	$3{,}73 \times 10^{-3}$ kg/m²
	SOx/SO2	$3{,}14 \times 10^{-4}$ kg/m²
	Particles (PTX/PM10)	$7{,}88 \times 10^{-3}$ kg/m²

Water	No emissions to water	-
	Water utilization	$4{,}32 \times 10^{-4}$ L/m²
Non Dangerous Residues	Recyclable	1,23 kg/m²
	Disposable	$4{,}28 \times 10^{-2}$ kg/m²
Dangerous Residues	Recyclable	$2{,}02 \times 10^{-3}$ kg/m²
	Disposable	$2{,}81 \times 10^{-4}$ kg/m²
Energy	Natural Gas	0,11 GJ/m²
	Electricity	5,8 kW.h/m²

2.4 Utilization Information

Product life expectancy for ceramic tiles is more than 50 years under normal conditions. All packaging materials all fully recyclable or could be reused. Cardboards are made from recycled papers and could be 100% recycled. Plastics, including straps, films and shrink wrap covers, are 100% recyclable. Pallets are meant to be reused and, in their life's end, could be fully recycled.

The products that we use to build and furnish our indoor environments can have a significant impact on indoor air pollution levels. CINCA have obtained the GREENGUARD Gold Certification for its Ceramic Floor and Wall Tiles. Products that have achieved GREENGUARD Certification are scientifically proven to meet some of the world's most rigorous, third-party chemical emissions standards — helping reduce indoor air pollution and the risk of chemical exposure while aiding in the creation of healthier indoor environments.

GREENGUARD Gold Certification Criteria for Building Products and Interior Finishes

Criteria	CAS Number	Maximum Allowable Predicted Concentration	Units
TVOC (A)	-	0.22	mg/m³
Formaldehyde	50-00-0	9 (7.3 ppb)	µg/m³
Total Aldehydes (B)	-	0.043	ppm
4-Phenylcyclohexene	4994-16-5	6.5	µg/m³
Particle Matter less than 10 µm (C)	-	20	µg/m³
1-Methyl-2-pyrrolidinone (D)	872-50-4	160	µg/m³
Individual VOCs (E)	-	1/2 CREL or 1/100th TLV	-

(A) Defined to be the total response of measured VOCs falling within the $C_6 – C_{16}$ range, with responses calibrated to a toluene surrogate.

(B) The sum of all measured normal aldehydes from formaldehyde through nonanal, plus benzaldehyde, individually calibrated to a compound specific standard. Heptanal through nonanal are measured via TD/GC/MS analysis and the remaining aldehydes are measured using HPLC/UV analysis.

(C) Particle emission requirement only applicable to HVAC Duct Products with exposed surface area in air streams (a forced air test with specific test method) and for wood finishing (sanding) systems.

(D) Based on the CA Prop 65 Maximum Allowable Dose Level for inhalation of 3,200 µg/day and an inhalation rate of 20 m^3/day

(E) Allowable levels for chemicals not listed are derived from the lower of 1/2 the California Office of Environmental Health Hazard Assessment (OEHHA) Chronic Reference Exposure Level (CREL) as required per the CDPH/EHLB/Standard Method v1.1 and BIFMA level credit 7.6.2 and 1/100th of the Threshold Limit Value (TLV) industrial work place standard (Reference: American Conference of Government Industrial Hygienists, 6500 Glenway, Building D-7, and Cincinnati, OH 45211-4438).

The GREENGUARD Certification is recognized and referenced in numerous building programs, standards and specifications around the world. Products with GREENGUARD Certification or GREENGUARD Gold Certification can contribute to the achievement of points in established green building rating systems (as the LEED® system managed by USGBC®), satisfy code or ordinance criteria and meet indoor air quality specific RFP requirements.

2.5 End Of Life Information

Under normal use conditions, life expectancy of ceramic floor and wall tiles is greater than any other covering. In the case of product renewal, they could be also recycled to be used as raw materials for other industries. Anyway, if disposal on appropriated landfills is intended, our products are considered completely inert so there is no need of any special care.

2.6 Other Information

Following its commitment towards sustainable development, CINCA is a member of U.S. Green Building Council® (USGBC®), one of the most prestigious organizations dedicated to sustainable construction. USGBC groups more than 13.000 organizations worldwide and more than 180.000 professionals around a vision that is possible to develop in the upcoming generations construction standards that are environmentally sustainable, by changing the way buildings are conceived, built and managed. USGBC manages LEED® (Leadership in Energy and Environmental Design), the most broadly recognized green certification system for construction, management and maintenance of all buildings, houses e communities. More than 148.000 m² of construction are LEED certified on a daily basis all around the world.

LEED Credit ([1])	Information
MR Credit 4 Recycled Content (1-2 points)	It has up to 3% of pre-firing recycled materials (pre-consumer). It has up to 9,5% of after-firing recycled materials (pre-consumer).

([1]) LEED® 2009 for New Construction & Major Renovations™ (Updated April 2013)

LEED Credit ([1])	Information
MR Credit 5 Regional Materials (1-2 points)	Are produced in our Fiães Production Unit located in Portugal. Uses natural raw materials with origin in the region of Leiria – Portugal.
MR Credit 2: Construction Waste Management (1–2 points)	All the packaging materials (card boxes, wrapping plastics and pallets) are fully recyclable and/or could easily reused.
IEQ Credit 4.3 Low-Emitting Materials (Flooring Systems) (1 points)	Non-applicable on the in the context of the product (very high temperature firing – 1150ºC – burns all VOC's).
SS Credit 7.1 Heat Island Effect. Nonroof (1 points)	Non-applicable on the in the context of the foreseeable utilization (internal use – this credit is only applicable to external uses).
ID Credit 1 Innovation in Design (1-5 points)	In normal use conditions, its life expectancy is superior to many other product intended for the same utilization. It is considered fully inert and could be recycled as an inert material in the construction industry or as raw material for other industries.

2.7 Life Cycle Assessment (Cradle to Gate)

2.7.1 Declared Unit

Name	Value	Unit
Declared Unit	1	m^2
Grammage	22.15	kg/m^2
Conversion Factor to 1 kg	0.04515	

2.7.2 System Boundary

This is a cradle to gate EPD based on industry averages. The system boundary involves raw materials extraction and transport, as well as the tiles production. Production stages include milling and pre-preparation of raw materials, spray drying to form body powder, pressing, drying, glazing, firing and packaging. Transport is only relevant for delivery of raw materials to the plant and forklift usage within the factory. Process waste is recycled within the process. Ceramic scrap is used in body preparation as part of factory recycling.

2.7.3 LCA Scenario

Reuse- Recovery- Recycling Potential (D): Ceramic floor tiles normally end up in inert landfill sites with other building waste after their utilization. Anyhow, ceramic tiles are considered to have a potential life duration of more than 50 years, surpassing frequently the lifetime of the construction where used upon. They can be recycled back for utilization in different applications. However, no possible benefits of recycling were taken into account in the present analysis.

2.7.4 Results

Description of the System Boundary

Product Stage				Construction Process Stage				Use Stage				End Of Life Stage				Benefits and Loads Beyond the System Boundaries
Raw Material Supply	Transport	Manufacturing	Transport	Construction Stage	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	Demolition	Transport	Waste Processing	Disposal	Reuse- Recovery- Recycling Potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	MND	MND	MND	MND	MNR	MNR	MNR	MND	MND	MND	MND	MND	X	MND

X – Included in the LCA; MND – Module Not Declared; MNR – Module Not Required

Results of the LCA – Environmental Impact: 1 m^2 of ceramic floor tiles

Parameter	Unit	A1	A2	A3	C4
Global warming potential	kg CO_2 eq	3.71	0.60	7.20	0.23
Depletion potential of the stratospheric ozone layer	kg CFC11 eq	3.90E-7	7.50E-8	7.80E-7	5.90E-8
Acidification potential of land and water	kg SO_2 eq	1.70E-2	7.56E-4	3.71E-3	4.93E-4
Eutrophication potential	kg PO_4^{3-} eq	1.35E-2	3.46E-3	7.35E-3	1.25E-3
Form. pot. of tropospheric ozone photochem. Oxidants	kg Ethen eq	6.10E-3	7.15E-4	1.63E-3	3.25E-4
Abiotic depletion potential for non-fossil resources	kg Sb eq	2.72E-2	4.05E-3	6.03E-2	2.73E-3
Abiotic depletion potential for fossil resources	MJ	63.62	9.15	127.00	6.07

Results of the LCA – Resource Use: 1 m^2 of ceramic floor tiles

Parameter	Unit	A1	A2	A3	C4
Renewable primary energy as energy carrier	MJ	4.23	0.08	10.47	0.76
Renewable primary energy resources as material utilization	MJ	0.00	0.00	0.00	0.00
Total use of renewable primary energy resources	MJ	4.23	0.08	10.47	0.76
Non renewable primary energy as energy carrier	MJ	48.94	9.20	120.41	5.04
Non renewable primary energy as material utilization	MJ	0.00	0.00	0.00	0.00
Total use of non renewable primary energy resources	MJ	48.94	9.20	120.41	5.04
Use of secondary material	kg	IND	IND	IND	IND
Use of renewable secondary fuels	MJ	IND	IND	IND	IND
Use of non renewable secondary fuels	MJ	IND	IND	IND	IND
Use of net fresh water	m^3	4.18E-2	5.23E-3	4.32E-3	5.73E-3

IND – Information Not Disclosed

Results of the LCA – Outflows and Waste Categories: 1 m^2 of ceramic floor tiles

Parameter	Unit	A1	A2	A3	C4
Hazardous waste disposed	kg	IND	IND	2.81E-4	IND
Non hazardous waste disposed	kg	IND	IND	4.28E-2	IND
Radioactive waste disposed	kg	IND	IND	0.00	IND
Components for re-use	kg	IND	IND	IND	IND
Materials for recycling	kg	IND	IND	1.23	IND
Materials for energy recovery	kg	IND	IND	IND	IND
Exported electrical energy	MJ	IND	IND	0.00	IND
Exported thermal energy	MJ	IND	IND	0.00	IND

IND – Information Not Disclosed