

CERDOMUS

ENVIRONMENTAL DECLARATION 2024

(data updated as of 31/12/2023)



ENVIRONMENTAL DECLARATION drawn up pursuant to Regulation (EC) No 1221/2009 (EMAS) as well as amended and supplemented by Reg. EU 2017/1505 and Reg. EU No 2018/2026



UNI EN ISO 9001:2015
UNI EN ISO 14001:2015

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COMPANY DETAILS

Company Name: **Cerdomus S.r.l.**

Legal Representative: **Paolo Turbati**

Delegate for Quality, Safety and Environment: **Mr. Massimiliano Gozzi**

Management Representative for EMS: **Eng. Marco Sangiorgi**

Registered and operational office: **Via Emilia Ponente, 1000 - 48014 Castel Bolognese (RA), Italy**

Tel: 0039 0546652111 Fax: +39 0546 50010

E-Mail: info@cerdomus.com

PEC - Certified Email Address: cerdomus@pec.it

Shipping Warehouse Office: **Via Calamello, 1035 - 48014 Castel Bolognese (RA)**

Tel: 0039 0546652600

E-Mail: u.spedizionip5@cerdomus.com

Italian Tax Identification and VAT Number: **02620780391**

Registration number in the Italian Business Register: **RA- 217992**

On 1 January 2019 Cerdomus S.r.l. was formed from Cerindustries S.p.A, which was born out of the transfer of the Cerdomus Ceramiche S.p.A business unit on 1 October 2009. Cerdomus S.r.l. connects a number of trademarks, including the most important ones, CERDOMUS and PORCELLANA DI ROCCA, which are manufactured in the currently ISO 9001 - ISO 14001 certified and EMAS registered production plant located in Castel Bolognese (RA), Italy.

Based on past experience, the management aims to maintain and increase environmental performance, as it regards the certifications it has obtained not as an objective, but as a springboard to further develop the current environmental management system it has adopted.

The management of Cerdomus S.r.l. has therefore decided to adopt, keep active and improve the Quality and Environmental Management System, complying with international standards such as:

- UNI EN ISO 9001:2015
- UNI EN ISO 14001:2015
- Regulation (EC) No. 1221/2009 (EMAS) as amended and supplemented by EU Reg. No 2017/1505 and EU Reg. No. 2018/2026.

The scope of these certifications is the design and development, production and marketing of tiles and trims (special pieces) in fine porcelain stoneware through the process of milling, pressing, drying, glazing, firing, selection, cutting, lapping, packaging, as well as customer service.

The aim of this document is to provide detailed information on production activities and, therefore, on the possible effects that these may have on the environment, and to describe what has been done so far to improve environmental performance, and to set out the objectives and programmes planned for the future.

COMPANY POLICY FOR QUALITY AND ENVIRONMENTAL PROTECTION

Cerdomus Srl considers both the Quality of its processes and products and the protection of the Environment to be of fundamental importance. In order to comply with such values, its policy is to:

- *Pursue continuous improvement of customer satisfaction through the quality, reliability and innovation of its products;*
- *Safeguard the environmental integrity by pursuing continuous improvement of its environmental performance and consequently monitor and optimise consumption and emissions;*
- *Guarantee strict respect on the part of the entire organization for the applicable regulations with regard to product requirements and environmental protection, as well as occupational health and safety, through the performance of systematic controls;*
- *Build and constantly improve the motivation, competence and awareness of staff in terms of its fundamental contribution to achieve the company's business and environmental objectives;*
- *Maintain constant information and constructive dialogue with customers, suppliers, the territory and the people who inhabit it, in order to better understand their needs and expectations and to disclose the company's commitment in terms of quality and environmental protection.*
- *Increase the quality level of business processes, also by improving the infrastructures used for their functioning.*

Cerdomus is committed to continuous and systematic action in order to achieve these objectives. This includes the implementation, maintenance and continuous improvement of a Quality and Environmental Management System.

Cerdomus invites all staff to work alongside the company in maintaining and improving the results already achieved. Cerdomus considers ensuring the Quality of its products, maintaining customers' trust - and, more generally, the trust of all interested parties - and guaranteeing the protection of the Environment to be a commitment and a moral responsibility.

Everyone, within their respective responsibilities and competences, must regard quality of the product and environmental protection as a matter of primary importance and as an integral part of their work. The staff is therefore invited to provide ideas for improvement relating to its area of activities.

Castel Bolognese, 01/10/2021

Top Management

CERDOMUS S.R.L.
P.E.O.
Legale Rappresentante



1. COMPANY DESCRIPTION AND ACTIVITIES

1.1 Company presentation

Cerdomus S.r.l. was formed on 1 January 2019 out of the transfer of the company business undertaking of Cerindustries S.p.A.. It then developed further and established itself as a company with a focus on advanced technology, diversification, and product quality.

Its over 40 years of experience, first as Cerdomus Ceramiche S.p.A and then as Cerindustries S.p.a., have enabled the Company to become renowned around the world for its top-quality products and for the constant commitment it has shown by continually investing in plants that meet the highest technological standards, production capacity and respect for the environment.

One of the top companies in the ceramics industry, Cerdomus S.r.l. is based at its modern, well-equipped plant at Castel Bolognese (RA), Italy, not far from the ceramics cluster around Modena, where it is able to maintain its originality in research and production.

Intense research work conducted by a specialized team ensures a range of products with constantly evolving aesthetic characteristics, which undergo regular quality control and are constantly being improved so as to offer a brand of superb quality.

1.2 The history of the company

- Cerdomus Ceramiche S.p.A was founded in 1969, with the establishment of the company on an area for agricultural use, located in Via Emilia Ponente, 1000 in Castel Bolognese (RA), Italy.
- In 1979, it expanded its equipment to accommodate the new rapid single-fired white-paste (white body) mixture technology.
- In 1996, the construction of the modern plant began. This was dedicated entirely to porcelain stoneware in order to create innovative products of superior technical and aesthetic quality.
- 1998 saw the expansion of the porcelain stoneware production facilities and building of the new headquarters. A two-storey metal-and-glass structure, with relief decoration in hand-made brick based on original designs, accommodates the company's administration, sales and marketing departments and showroom.
- In 2002, the company expanded its warehousing space for finished products.
- In 2006, construction began of an extension of the main building to be used for processing finished product.
- In 2007, following this expansion, the company set up its polishing work centre so as to offer the customer the vastest possible selection area for the materials it produced. The same year saw the construction of the new shipping warehouse - located in via Calamello, 1035 – Castel Bolognese (RA) – with a total area of about 85,000m², of which about 4,200m² is covered.

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- In 2008, there began a radical restructuring of the production plant's atomization, glazing, firing and selection units, which optimized and simplified production layout. The company also planned and built internal and external paths, thus clearly demarcating the areas to be used by operating machinery and pedestrian paths.
- On 1 October 2009, following the acquisition by Porcellana di Rocca S.p.A. (with its main plant at Rocca S. Casciano), Cerindustries S.p.A was born from the Cerdomus Ceramiche S.p.A business unit.
- At the end of 2009, Cerindustries S.p.A. ceased production at the Rocca San Casciano site to concentrate production at the factory in Via Emilia Ponente, 1000 in Castel Bolognese (RA).
- In 2011, Cerindustries S.p.A. expanded the polishing work centre's areas at the Castel Bolognese (RA) production plant by introducing production lines and machines for the multi-format cutting of fired materials.
- In 2014, in the Castel Bolognese (RA) production plant, following the disposal of two old firing kilns no longer in use since 2008, a new firing line was installed and a kiln was transferred to that location from the former Rocca San Casciano production site.
- In 2015, the Castel Bolognese (RA) production plant saw the old fired-materials handling plant replaced by a new one consisting of five latest-generation automatic laser-guided vehicles providing increased load capacity.
- In 2016, a new automated large-format line was installed in the selection area.
- In 2017, Cerindustries S.p.A. senior management changed. Between the end of that year and the beginning of 2018, the MONO1 operation department (where small size tiles of up to 30x30 cm were produced) and the Special Pieces and l'Astorre Art Ceramics production plant were discontinued since they were by then obsolete.
- In 2018, a new full polishing line was installed alongside the two existing grinding and cutting lines, served by a new waste water treatment plant.
- On Jan. 1st, 2019, Cerindustries S.p.a. changed its name to Cerdomus S.r.l.
- In 2019, Cerdomus S.r.l. integrated the Environmental Management System also with the ISO 9001:2015, thus implementing the Quality and Environmental Management System.
- The Cerdomus S.r.l. Top Management underwent changes in 2021.
- In September-October 2022 Cerdomus S.r.l. began restructuring its plants, with the dismantling of 4 production lines and 2 wet cutting/grinding/lapping lines, and the installation of 1 continuous production line and 2 dry grinding/cutting lines, in the context of the project called "**Modernisation of the production lines**" of its production facility located in the municipality of Castel Bolognese, on via Emilia Ponente 1000, whose purpose was the installation of a new continuous line. To this end, a request for a procedure to verify whether the property is subject to EIA (Screening) pursuant to Art. 10 of Emilia-Romagna Regional Law 4/2018, Annex B, Cat. B.2.60, and Art. 19 of Legislative Decree 152/2006 was submitted to the Emilia-Romagna Region. These plant changes led to an increase in the maximum production capacity of the installation, equal to approximately 10.57%, from 95,680 tons/year (4,160,000 m²/year)

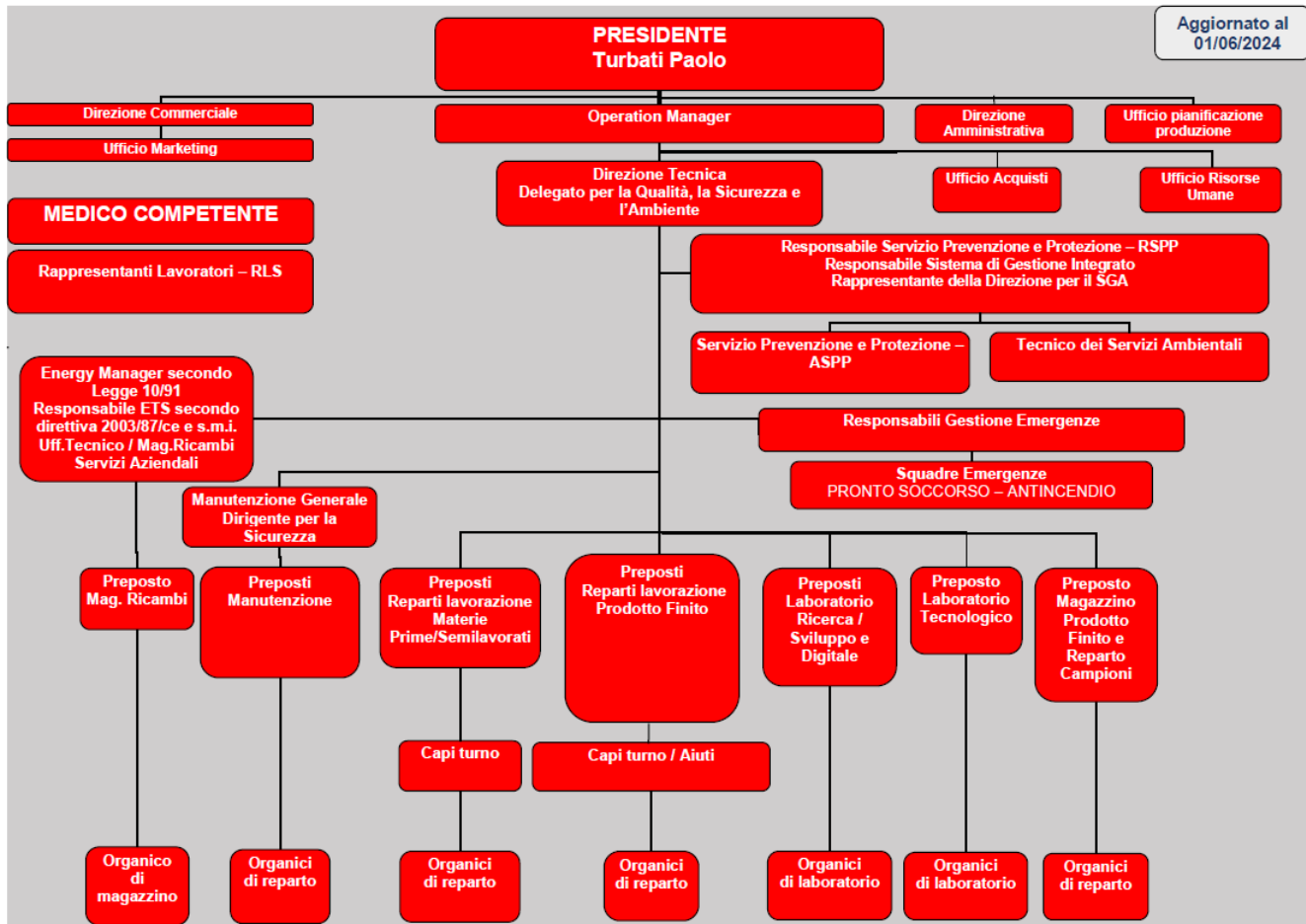
corresponding to 262 tonnes/day, to 105,800 tonnes/year (4,600,000 m²/year) and corresponding to 290 tonnes/day. The project was described in the preliminary environmental study and the potential impacts that could derive from its implementation analysed. The aforementioned plant change notified and subject to verification of eligibility for EIA (screening), concluded with the issue of Emilia Romagna Region's Director Resolution **no. 2075 of 02/02/2023**, which excluded the "modernisation of the production lines" from the additional EIA procedure, in compliance with the specific environmental conditions provided; in particular, for emissions into the atmosphere, the annual mass flow of conveyed emissions from the installation was substantially unchanged compared to the situation before the modification.

On 09/02/2023 CERDOMUS srl also submitted, via the AIA IPPC Regional Portal, the suitable documentation for the authorisation phase contained in the aforementioned Resolution, addressed to the Ravenna ARPAE Authorisations and Concessions Service.

At the conclusion of this authorisation process on 10/05/2023, the Union of Romagna Faentina - One-Stop Desk for production activities, notified via certified email (PEC) to Cerdomus srl the release of **Resolution AIA DET-AMB-2023-2288 of 05/05/2023 - non-substantial change** in force. In summary, with the project called "Modernisation of production lines", Cerdomus modified some production lines of the Castel Bolognese plant by replacing some equipment with advanced technology machinery, in order to improve production yields and provide a higher quality product. The modification intervention addressed multiple needs, including the modernisation of systems that were approximately 25 years old and technologically obsolete, the installation of a processing line capable of producing large tiles measuring up to 1600x3200 mm, and the energy efficiency of processes, thus replacing four production lines with a single more efficient production line and a reduction in energy consumption.

1.3 Company governance structure

CERDOMUS S.r.l. - Assetto organizzativo ed Organico generale per la Qualità, la Sicurezza e l'Ambiente



The diagram above shows Cerdomus S.r.l.'s current organisational structure for Quality, safety and environment. The current Director has formally entrusted the plant's Technical Director for safety and the environment with managerial, spending and control powers. The Management Representative for EMS is Engineer Marco Sangiorgi.

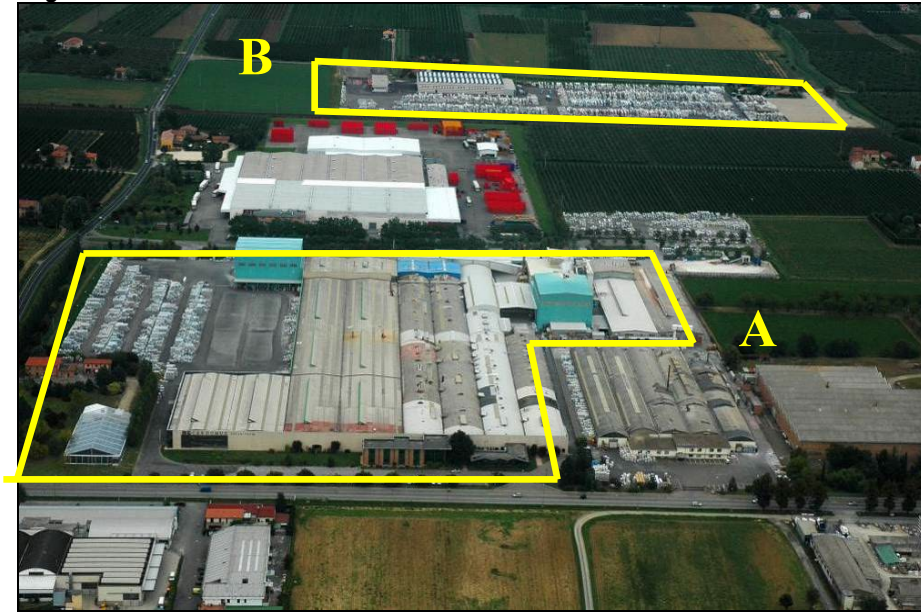
1.4 Geographical placement and urban planning

Cerdomus S.r.l.'s principal assets:

- One production plant in Castel Bolognese (identified as area A in Fig.1.1 on the following page): this is located in Via Emilia Ponente, 1000 and covers a total surface area of approximately 104,000m², of which approximately 56,000m² are covered. The covered surface includes production areas, warehouses, offices, showroom and service rooms; while the uncovered surface is divided into finished product warehouse, purification areas, parking lots and garden.
- one shipping warehouse (identified as area B in Fig. 1.1. on the following page) is located in Via Calamello, 1035 and covers a total area of approximately 85,000m², of which about 4,200m² are covered. The covered area includes an office building and a warehouse for the storage of samples.

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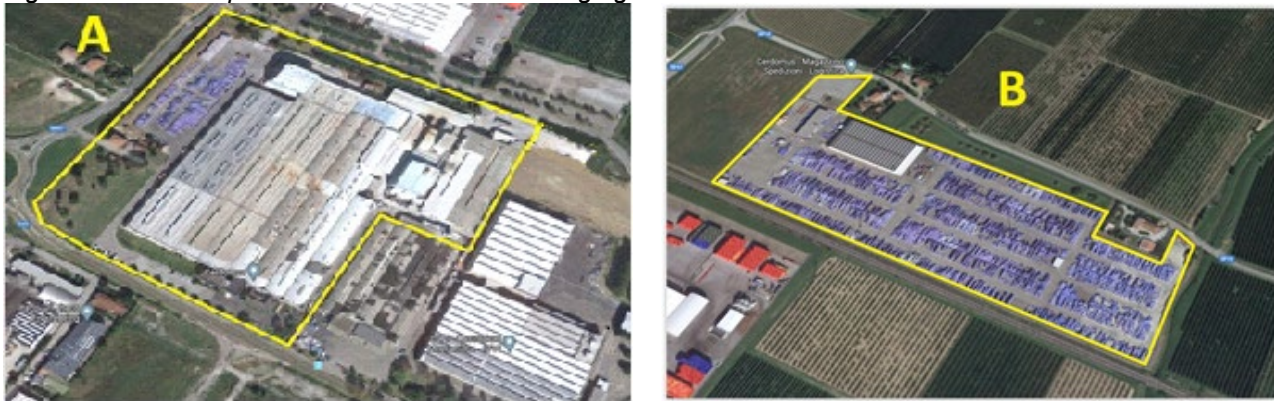
Fig 1.1- Overview of the site –



As it is possible to observe from Fig.1.1, the main site of Cerdomus S.r.l. includes two non-adjacent areas (identified by letters A and B):

- Area A: main production plant comprising raw material storage area, laboratories, water purifier, finished product warehouse, office buildings, showroom, employee car parks;
- Area B: shipping warehouse including the finished product storage area, container loading and shipment area, office buildings and samples warehouse.

Fig 1.2 — Satellite photos of the two areas belonging to the site –



As can be observed from Fig.1.2, the production plant (area A), as indicated by the General Regulatory Plan (GRP) of the municipality of Castel Bolognese, is located in "an already urbanized industrial and workshop area" and borders:

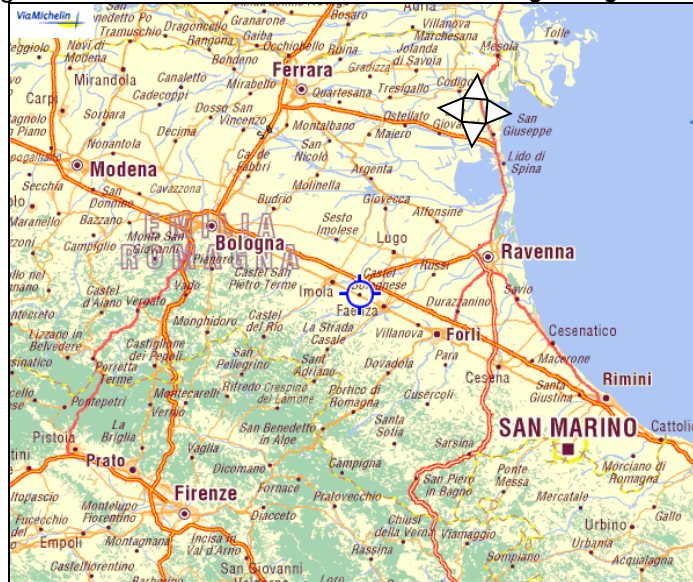
- to the southwest, Via Emilia Ponente S. S. No. 9;
- to the northwest, Via Borello S. P. No. 47;
- to the northeast, Via Della Resistenza and an agricultural area;
- to the southeast, the "La Fabbrica" company and an agricultural area;

As one can observe from Fig.1.2 of the previous page, the shipping warehouse (area B), as indicated by the GRP of the municipality of Castel Bolognese, is classified as "area for outdoor storage of finished products" and borders:

- to the southwest, the Bologna-Ancona railway line,
- to the northwest, Via Borello S. P. No. 47,
- to the northeast, Via Calamello and a house,
- to the south east, an agricultural area.

As indicated in the following Fig.1.3, the area of the settlement is located in the Po Valley, on the slopes of the Tuscan-Romagna Apennines, along the S. S. No. 9-Via Emilia, and is about 38 km from Bologna, about 30 km from Ravenna and 100 km from Florence. The production site is located 44 metres above sea level (GPS coordinates: 44 ° 19 '42.47" N and 11°46 '55.00" E); it is located about 2 km west of the centre of Castel Bolognese (RA) and about 7 km east of Imola (BO) and about 10 km west of Faenza (RA).

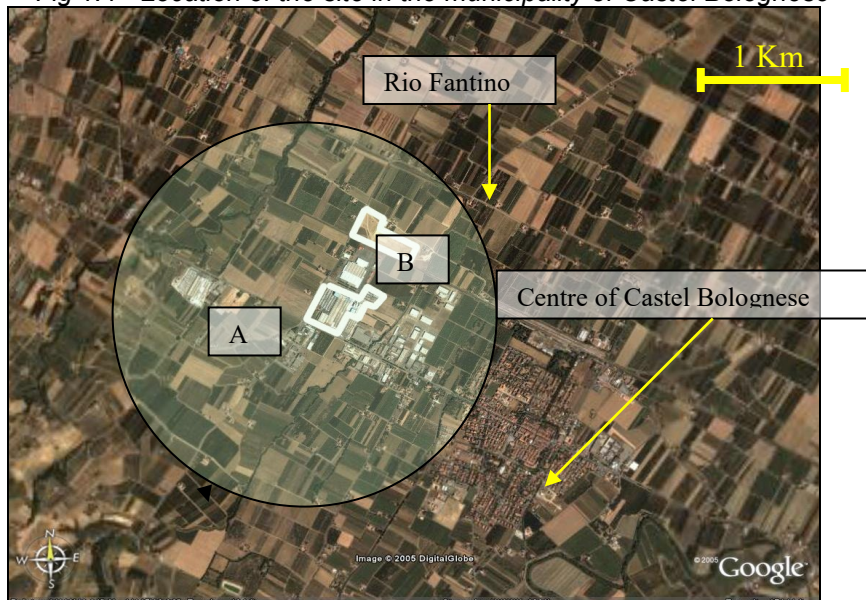
Fig 1.3 - location of the site in the Emilia Romagna region –



In Figure 1.4 of the following page, the location of the plant within the municipality of Castel Bolognese is shown, with particular reference to the immediately surrounding area (approximate radius of 1 km). Within this range, the following are considered to be potentially exposed to environmental impact:

- the Rio Fantino stream;
- agricultural crops;
- several homes.

Fig 1.4 - Location of the site in the municipality of Castel Bolognese -



1.5 Geological and stratigraphic classification of the site

On a local scale, the area of the plant Cerdomus S.r.l. in Castel Bolognese is affected exclusively by Pleistocene sedimentary formations characterized, lithologically and stratigraphically, by 3rd-order terrains of the terraces of the Senio torrent, which are of a clayey-loamy-sandy nature on the surface. The soils of the “terrace” are lenticular and lie over the Plio-Pleistocene grey-blue clays formation that forms the substrate.

The surrounding area is partly urbanized as an industrial-workshop area and partly used as agricultural land, cultivated with orchard and arable land. The granulometry of the lithological particles on the surface is fairly homogeneous, although locally sandy and clayey areas with calcareous concretions called “Cat's brains ” are found. It is extremely difficult to outline these granulometric differentiations as the passage from one to the other is not well-defined but gradual.

There are no morphological and hydro morphological differentiation components at the site under examination or in adjacent ones which may have an impact. At present, surface erosion is practically non-existent. The combination of these phenomena gives rise to a slightly inclined plane towards the northeast with very weak declivity. In the area, there are no prevailing degradative processes related to lithology, structure, acclivity, precipitation intensity and human activities.

1.6 Local hydrology and hydrogeology

From the local point of view, the area under consideration is gently rolling terrain and the surface water supply is considerably limited and is reduced practically to the only rainwater falling on the area. In the most downstream sector of the plain, groundwater aquifers were set during the recent sandy-loamy floods and are fed mainly by the under-flowing waters of the main streams and by effective infiltration in the relatively more permeable areas.

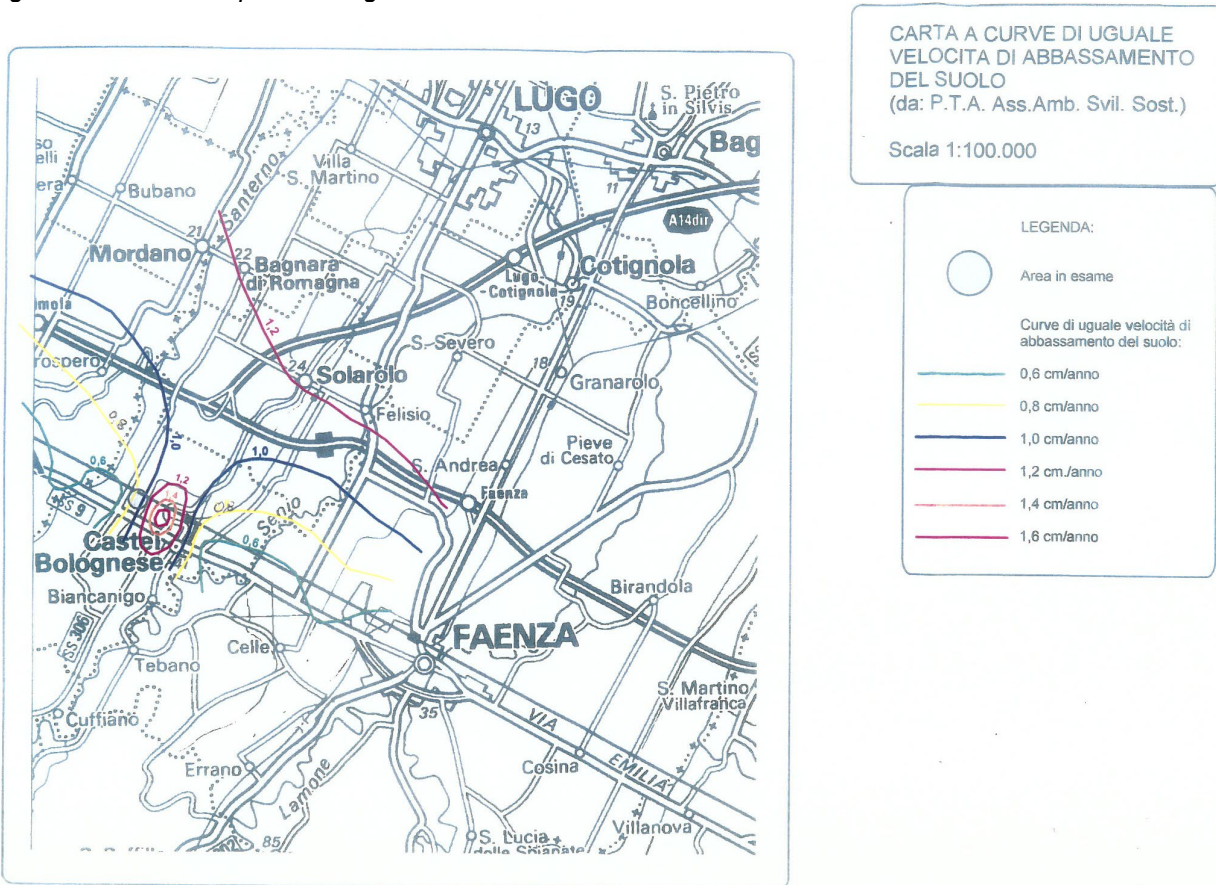
At present, regulation of surface water is ensured by the system of drainage ditches in the cultivated areas, which drain the water to the main hydrological element represented by the Rio Fantino stream, which flows in the eastern zone and, within the area under investigation, presents hydraulic dimensions which do not represent a flood risk.

1.7 Subsidence in Cerdomus S.r.l. production plant area.

Examining the results of the various analyses carried out over time on local subsidence phenomena in the province of Ravenna obtained by measurement of levelling that has occurred in past years and applying them to the area of Castel Bolognese under consideration, we can deduce the following (See Fig.: 1.5):

- The area surrounding the plant Cerdomus S.r.l. has very low subsidence rates of between 0.8-1.00 cm/year
- In Castel Bolognese's city centre, slightly higher subsidence rates of 1.40–1.60 cm/year were measured but which are not critical compared to other areas of the province, such as those south of Lugo (subsidence rate of 2.80-3.00 cm/year).

Fig. 1.5 - Contour map of same ground subsidence -



2. PRODUCT LIFE CYCLE

Porcelain stoneware **ceramic tiles** (also referred to as “**tiles**”) are finishing building materials used for covering floors and walls. Tiles are slabs of various formats and sizes, made from clay, sand, feldspars and other natural substances fired at high temperatures. This material mix, or paste, determines the particular ceramic type of the tiles. The paste mixture is then given shape through special forming processes and is fired in special kilns at very high temperatures (up to 1220 °C). Ceramic tiles are products whose environmental impact is lower than other materials because of the intensity of technological, production plant engineering and manufacturing innovation promoted by the Italian ceramics industry. To establish the **environmental impact of ceramic tiles**, their whole **life cycle** and hence all the phases including extraction, production of raw materials, destruction and final destination of waste have to be analyzed.

The **first of the analyzed phases** refers to the **extraction and processing of the raw materials** used in the production of the tiles. The environmental impact of **quarries** can be seen in, on the one hand, the **changes in the landscape**, and on the other in **resource consumption, dust emissions and waste production**.

The production phase is the main segment of the life cycle. The most significant environmental aspects associated with the manufacture of tiles are: gaseous emissions, water consumption and wastewater discharges, waste, energy consumption and noise; all these aspects are described below in this Environmental Declaration. Cerdomus, subject to its production needs and product quality, looks for suppliers which are closest to its production plant and gives priority to companies with environmental certifications in order to reduce the environmental impact of the transportation of cargo.

Water consumption by the Italian ceramics industry is lower than required since waste water is reused in the production process to limit environmental pollution.

This industry sector in Italy is also able to recycle most of the waste produced. Ceramic processing typically has significant energy requirements. Thanks to technological and plant innovation, the entire sector now consumes less than half of energy compared to the 1970s.

The **next** phase in the tiles' life cycle is **final laying**. Materials used for the laying and filling of joints have little impact toxicologically speaking.

In terms of safety, tiles limit the health and environmental risks associated with laying.

Tiling demolition rounds off the life cycle of this ceramic product. Demolition waste, which is by nature inert, can be disposed of in the environment without any particular risk. In a service life ranking, tiles hold a pre-eminent position compared to other finishing materials. Properly installed tiling can, in fact, last a long time, and thereby generates a smaller amount of debris.

Cerdomus, as a ceramic company with corporate membership of Confindustria Ceramica (Italian Ceramics Industry Association), holds an Italian EPD (Environmental Product Declaration) MEDIA SETTORIALE certification for its products.

This EPD certification is an environmental product declaration that is certified and may be voluntarily disclosed, in accordance with codified criteria, which is gaining global interest as a tool for qualifying and selecting products with environmental value.

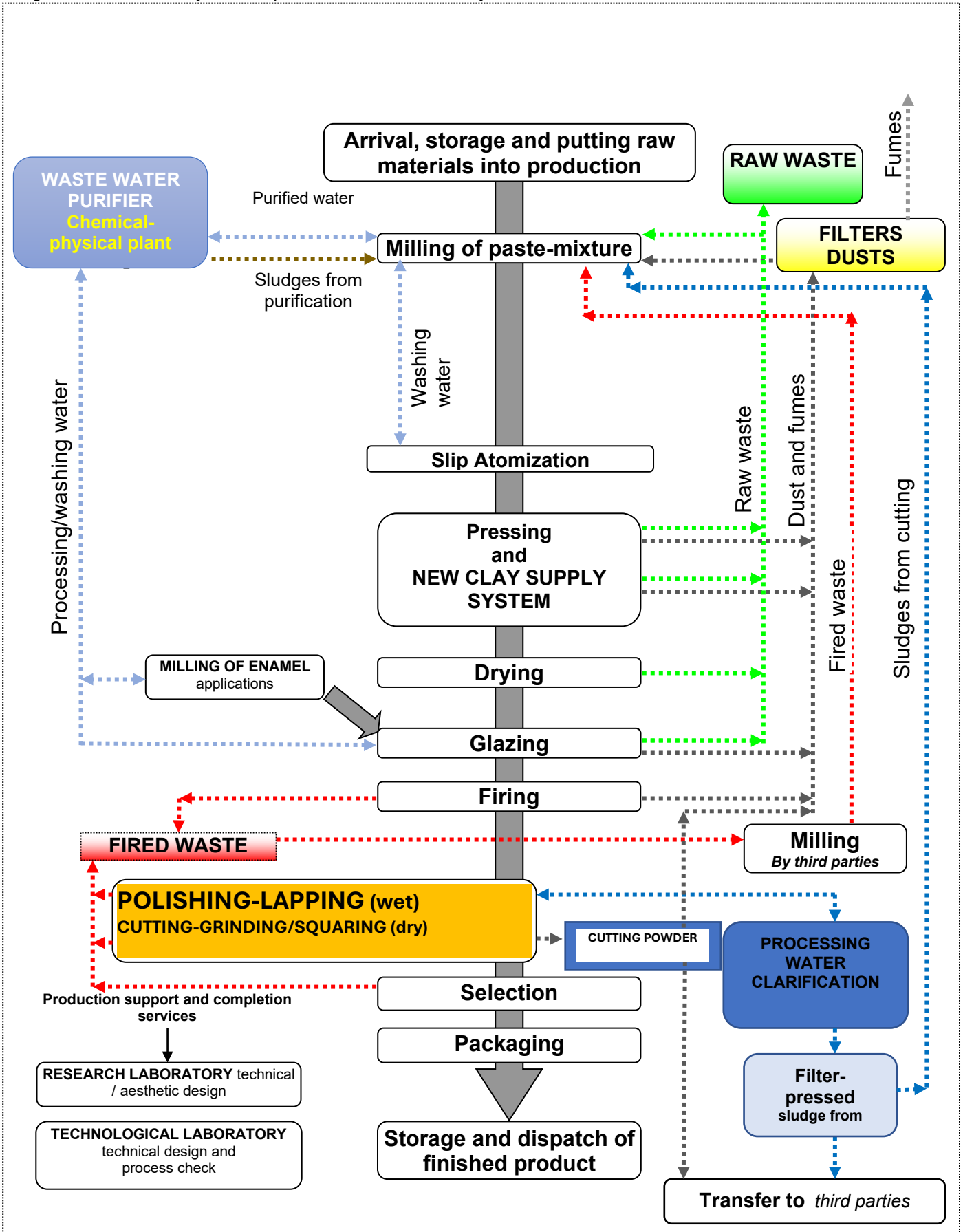
The study analyzes the environmental data of more than 90 Italian companies producing ceramic tiles over their entire life cycle and thus, for the large number of companies involved, is a world first for the construction industry.

The *EPD media settoriale* study presents lower environmental impact data than other similar studies such as the Global Warming Potential (GWP) which represents the effect on global warming expressed in CO₂ equivalents. Results that highlight the high levels of environmental performance resulting from the continuous investments that companies have put in place to improve their environmental performance.

In a global market in which sustainability has become a key competitive tool, the EPD media settoriale study will further strengthen the leadership of the Italian ceramic tile industry within all the most prestigious sustainable construction rating systems such as LEED and within green procurement in the public sector (GPP: green public procurement).

3. DESCRIPTION OF PRODUCTION CYCLE

Fig 3.1 - Production layout with production waste recovery -



The production cycle (as shown in Fig. 3.1) is divided into a series of operations and activities carried out consecutively; the individual phases of the production cycle, called processes, are generally associated with a specific department, appropriately identified within the plant.

Each process supplies the subsequent one a semi-finished product called *output product*; it is instead referred to as an *input product* when it is received by another process.

Production waste (washing water, 'green' waste, fired waste, and sludges from cutting) is reintroduced into the production cycle as shown in Fig. 3.1.

Each raw material, semi-finished product and the finished product must have quality specifications which are controlled by an internal plan certified by a third party issuing the product certification.

3.1 Supply and storage of raw materials for the paste mixture and for the preparation of applications

The raw materials used for the preparation of the paste mixture (referred to below as 'support') are stored separately in special covered boxes and are then loaded into the loading hoppers of the milling plant by means of a loader.

The raw materials necessary for the preparation of applications (enamels, engobes and dyes used for the decoration and colouring of the support) are purchased in Big Bag industrial sacks or other suitable containers and then stored in the dedicated area.

3.2 Milling of raw materials for paste mixture

The process begins with the dosing of clays, kaolins, feldspars, recovery material, water and with the subsequent wet milling within two continuous mills: 1 SACMI MTC054 with capacity of 54,000 litres and 1 MTC041 with capacity of 41,000 litres. In the atomization work centre, there are also five discontinuous SACMI MTD340 mills with a capacity of 34,000 litres each, which, however, to date, are no longer used for the milling phase.

As it exits milling, a liquid solution called slip is produced, which is strained and then stored inside underground tanks equipped with agitators.

The processing/washing water is collected and purified; the water and sludge resulting from this process are reintroduced into the production cycle within the milling mills in the quantities as per the paste mixture formulation.

3.3 Atomization

Atomization phase consists in drying the slip: this process takes place within two SACMI ATM40 atomizers, each with a production capacity of about 12,000 kg/hour. The slip from the underground storage tanks is sent to the ATM machine via high-pressure pumps (30bar) and is nebulized inside it using a nozzle ring. Through a jet of hot air (about 500°C) produced by a methane gas burner, the nebulized slip is dried and transformed into atomized form ("powder" composed of granules with dimensional characteristics and pre-established residual humidity between 5.5% and 6.5%) that is collected at the ATM exit and sent to special storage silos by using conveyor belts.

Both ATMs are equipped with a vein colouring system that allows adding coloured pigments to the slip, thus obtaining an atomized product coloured throughout its mass.

3.4 Pressing

At the end of 2022, 4 SACMI hydraulic presses were dismantled in order to make space for a state-of-the-art SACMI PCR2000 continuous press, which is able to create a continuous carpet of raw support with a maximum width of 1750 mm; this support is then cut continuously into the formats required. With this press, it is possible to produce formats from 800 x 800 mm to 1600 x 3200 mm. The pressing system currently consists of 2 SACMI

hydraulic presses (Traditional lines 204 and 206) and 1 compaction system that shapes the slab (New continuous line).

The atomized product is drawn down from the storage silos by means of conveyors and is sent to hydraulic presses that use special isostatic moulds to compact the support and define the shape and type of structure of the product (Traditional Lines 204 and 206). In the new continuous line, however, the material is conveyed via belt to compaction, which shapes 6 to 22 mm thick slabs; the raw material slabs pass into the cutting machine to obtain the desired size; The output of the presses is "green" tiles with a residual humidity of between 5% and 6%, which are then sent to drying.

Production waste and the dust collected from the appropriate filtration plants serving the pressing work centres are either reintroduced to the production cycle, if possible, or are disposed of in the proper manner.

3.5 Raw tile drying

The drying system is made up of 2 SACMI vertical dryers (Traditional lines 204 and 206), 1 SACMI horizontal dryer 30 m long (New continuous line) and 1 pre-kiln dryer (New continuous line).

The drying phase takes place inside dryers equipped with methane gas burners at an average temperature of about 180°C and consists in the elimination of much of the remaining moisture from the "green" tiles.

Upon exiting the dryers, the tiles are now what is called "raw" and have mechanical characteristics such that they can be wet-decorated (with silk-screen pastes, enamels, engobes and so on) in the subsequent glazing process.

Here also, production waste and the dust collected from the appropriate filtration plants serving the various operating units are reintroduced into the production cycle, if possible, or properly disposed of.

3.6 Preparation of enamels

The enamel milling work centre produces all the semi-finished products used in the glazing work centre, milling the raw materials for enamelling inside discontinuous mills.

The processing/washing water is collected and sent to the purifier to be then reused within the production cycle.

Recent developments in the technology of digital decoration of tiles have reduced the need to make enamels and semi-finished products with traditional systems, as inks made directly by third parties are used.

3.7 Glazing of raw tiles

The glazing plant is made up of 2 lines (traditional lines 204 and 206) and 1 continuous glazing line.

The "raw" tiles, coming out of the drying process, move along a motorized transportation line consisting of belts, along which there are conveniently placed machines capable of spreading quantities of enamel and silk-screen pastes of a specific weight on the surface. Technological advances of recent years have significantly changed the decoration process as a result of the introduction of digital screen printing machines, which can reproduce complex graphics imported directly from computer files onto the support using special coloured inks.

The glazing plants are designed for the specific production of medium/large formats (from 300mmx300mm, 800mmx800mm, 600mmx1200mm, 1200mmx1200mm and 1600mmx3200mm), all equipped with a digital decorator. At the end of the glazing lines are installed loading machines that transfer the raw enameled and decorated tiles into roller boxes where they are stored pending subsequent firing process (Traditional lines 204 and 206). The slabs released by the horizontal dryer of the new continuous line undergo sequential glazing processes; specifically, the tiles pass inside glazing booths for digital

printing and decoration and, from there, to final enamel layer application; the tiles then pass inside a pre-kiln pre-heating dryer, to be subsequently conveyed to the actual kiln by ceramic rollers installed on the same line. Here also, production waste and dust collected by special filtration systems serving the glazing work centres are reintroduced into the production cycle, if possible, or disposed of properly. Similarly, processing/washing water is collected and sent to the purifier to be subsequently reused within the production cycle.

3.8 Firing

The firing system is made up of a total of 3 SACMI roller kilns (of which 1 is currently not working), of which the recently installed SACMI FMA 295 roller kiln for large formats, with a capacity of 8500 m²/day places on the new continuous line.

As far as traditional production lines are concerned, the decorated raw tiles, stored in the roller boxes, are transferred to the firing lines via LGV vehicles. In the new continuous line, however, enamelling is performed in the kiln. The firing process takes place in continuous roller kilns equipped with methane gas burners, within which the material follows a firing curve composed of a heating cycle (up to a maximum temperature of about 1220 ° C) and subsequently a predetermined cooling cycle which causes the material to take on the desired dimensional, mechanical and surface characteristics.

At the end of the firing phase, the product can either be sent to the selection and packaging phase or it can be further processed to produce higher-value surface characteristics or dimensions different from those made by the press.

The fired production waste is given to third parties to be ground and brought to pre-established granulometry so that this waste can be reused during the paste milling phase.

3.9 Polishing - grinding - cutting

The new requirements of the market have imposed the need to subject the product to a series of additional processes that give it higher-value characteristics. Additional processing consists mainly of:

- sanding/polishing wet surface treatment: the product is processed to obtain a higher surface quality and superior dirt resistance;
- dry cutting-grinding: the product is cut to obtain submultiples of the original size and worked on the edges in order to obtain more precise dimensions and to allow joint-free installation;

The processes performed within the department are always wet as regards the sanding/polishing line; the processing/washing water is collected and sent to a dedicated water purification plant, to be then reused within the same department's production cycle of the same department. The existing water clarification plant is always used for the treatment of waste water; the plant is equipped with a filter press for compacting the process sludge.

As regards the 2 new cutting-grinding lines, processing is dry.

Therefore, the additional processes of the sanding-cutting-grinding department take place on 3 lines:

2 dry cutting-grinding lines and 1 wet sanding-polishing line.

Also in this case, the firing production waste is given to third parties to be ground and brought to a pre-established grain sizes, so that it can be reused in the paste grinding phase as well as to process water called cutting dust, which is generated from dry grinding lines

From September 2020, up to 20% of the filter-pressed sludge from cutting is added to some types of mix; this was previously sent for recovery through an authorized company.

3.10 Selection of finished product

The last phase of the production cycle consists in the selection and packaging of the product; this process occurs primarily on the automated selection lines that divide the product by class (on the basis of geometrical/dimensional characteristics and the presence of any decoration defects/decolouration) and tone (based on the comparison with the tone of the product sample). The tiles, divided evenly, are then boxed and placed on the pallet.

The selection and packing system is made up of four (4) automated SYSTEM selection lines (served by laser-guided vehicles for pallet handling).

Here also, fired production waste is given to third parties to be ground down to a pre-established granulometry so that this waste can be reused during the paste mixture milling phase.

3.11 Packaging and storage of the finished product

The palletized material is protected by a heat shrink polyethylene cap and then transported outside, using forklifts, to the appropriate storage warehouses to await shipment.

3.12 Shipping warehouse

The finished product, once packed, is stored in two warehouses: one located within the main production site (Area A of Fig.1.1); the other at the shipping warehouse about 1 km from the plant (Area B of Fig.1.1).

The transport of the material between the warehouse placed inside the plant and the shipping warehouse is entrusted directly to a truck owned and handled by a driver working for Cerdomus S.r.l.

3.13 Research Laboratory and Technological Laboratory

The company has a research laboratory in which all new products are designed and developed for industrialization; the technological laboratory carries out quality controls on raw materials, semi-finished products, and finished product.

3.14 Water purifiers

Industrial waste water from the atomization, enamel milling and glazing work centres is carried into the storage tank using booster pumps. Waste water, with added specific flocculants, is sent to a sedimenter using lifting pumps, where the water is clarified by precipitation of the suspended solids contained in the solution. The sedimented part (sewage sludge) is expelled from the lower part of the sedimentation tank, filter-pressed or directly reintroduced in the paste milling stage, while the clarified waters are stored in storage tanks and are reused as milling water or washing water for the production line work centres.

Instead, the waste water from the polishing/grinding/cutting department is purified using a water clarification and microfiltration plant; the sludges are then filter-pressed and the solid sludges are partially reused in certain types of paste mixtures.

There is no outward flow of waste water from the production process at the plant.

3.15 Dust purification

Dust generated by the various stages of processing is sucked by special purification plants with fabric sleeve filters, which treat the air before expelling it into the environment. Dust contained in the filter sleeves is collected by an archimedean screw placed on the bottom of the purifier and channelled into special containers: the dust can then be reused or disposed of as raw waste or mixed with water and sent to storage tanks to be then reused during the milling phase.

A total of 18 dust filtration and purification systems and 6 AIA authorised drying chimneys (without filtration systems) have been installed to serve the production departments, each of which represents an emission point placed under periodic control by AIA monitoring.

3.16 Fume purifiers

The fumes generated during the firing phase are sent to special sleeve fume purification plants where the filtration takes place by chemical reaction, using hydrated lime as a reagent. The filtering sleeves, coated with lime, retain dangerous substances (such as Fluorine, NO_x and SO_x), which are collected at the filter outlet and properly disposed of by qualified operators.

Two fume filtration and purification installations have been installed to serve the firing work centre.

Specifically, starting from January 2023 the SACMI KAT single-layer roller kiln called FR1G (belonging to the E35 atmospheric emission point, which has been decommissioned) was removed and decommissioned from the plant layout of the kiln department and a new fume filter (called E46) was also installed to serve the new SACMI FMA 295 kiln integrated with the new continuous line for large sizes, called FR01; furthermore, in June-July 2023, the SACMI KMS single-layer roller kiln called FR2G was shut down due to production stoppage, and will remain disconnected from any cooking fume emission-filter point, while the emissions into the atmosphere from the SACMI FMS single-layer roller kiln called FR03 were conveyed to the E22 atmospheric emission point.

In summary, the Firing Department is made up of 3 ovens (FR01 [active], FR03 [active] and FR2G [production stopped and disconnected from filtration systems]); 2 fume filtration and purification systems (E22 FR03 Active and E46 FR01 Active), each of which represents an emission point placed under periodic AIA monitoring have been installed in and are currently serving the Firing Department.

3.17 Cogeneration

Inside the facility, a new MTU cogeneration plant has been installed, with a power equal to around 2,540 KWe. The previous 3,600 KWe plant remained active until 31/10/2021, the date of its decommissioning.

As planned, the new plant, as well as producing electricity (used primarily for self-consumption), reuses the thermal energy contained in the exhaust gases, sending them directly into the atomizer, and the thermal energy from the water used to cool the engine to pre-heat the combustion air for the burner and the slip entering the ATM. The installation of the new system was completed and came into operation on 16/10/2023.

4. TRAINING AND PARTICIPATION

The staff is trained on environmental aspects and shares the company's commitment to the environment and safety and our commitment to staff training (including new recruits) on the environment, safety and hygiene at work is underpinned by a well-established annual training plan. For this purpose, a simple, easy-to-understand information booklet has been drawn up which shows all of the company's activities and forms of protection it has adopted. In addition to this booklet, new entrants are also always provided with and shown the most recent version of the environmental declaration. Staff awareness and training levels are maintained through specific training meetings and interventions, and also by checking how effective the training is. Environmental awareness resulting from training can also be detected from how orderly and clean the plant is.

Table 4.1 shows data on the number of training hours spent by staff on safety and environment issues.

The company's Safety Officers are informed of the various environmental aspects even during the annual meeting centered on safety and the environment.

Table 4.1 —Staff Training—

Year	Average number of employees	Number of employees hired in the year	Training hours on safety and environment	Total hours worked	Index of training (hours of training/hours worked) x 1000
2020	170	6	309	235,212	1.31
2021	179	24	917	272,925	3.36
2022	181	19	348	267,482	1.30
2023	191	22	739	283,481	2.60

5. ENVIRONMENTAL ASPECTS OF SITE ACTIVITIES

All gaseous emissions are subject to an integrated environmental authorisation (AIA), Measure 337 dated 19/08/2009 and measure DET-AMB 2288 dated 05/05/2023 issued by SAC RA ARP Ae of Ravenna, which expires on 18/08/2025.

In the course of the drafting of the initial environmental analysis it was established what were the direct significant, direct non-significant and indirect environmental aspects to which the company would pay particular attention as aspects that have or may have significant impact on the environment.

The updating of these direct / indirect environmental aspects is reassessed every year during the updating of the environmental analysis or following significant changes in the production/plant process, considering mainly:

- Analysis of the legal limits with which the company must comply;
- Changes in production layout or finished product;
- Limits or indicators close to the values recorded by the company;
- Aspects not regulated by laws but essential to maintain a healthful environment (eg. unpleasant odours).

5.1 Significant direct environmental aspects

- Use of non-renewable raw materials such as clay, sand, feldspar and decorative applications consisting of natural elements and pigments; these materials make up the main mass of the finished product (support) and the decoration of the latter.
- Consumption of Natural Resources (water, electricity, natural gas, diesel)
 - processing water is taken from two authorized wells, while the one for civil use is supplied by the municipal aqueduct and accounted for on invoicing.
 - electricity: used for processing equipment (towing, moving mechanical parts, photocells, etc.);
 - natural gas: used in atomizers, dryers and firing kilns;

- diesel fuel: used for emergency power generators and automotive for lift trucks and mechanical loaders.
- Waste management: the waste produced on the site is of widely varying nature, identified by the EWC code and regulated by law. Duly authorized companies are used for waste disposal and recovery.
- Emissions into the atmosphere: channelled to the purification plants serving atomizers, firing kilns and dust extraction from the production departments; these emissions are regulated by legal limits, therefore they are monitored according to a control plan.
- Internal/external noise: regularly checked by an authorized company, and regulated by the municipal zoning (externally) and by Italian Legislative Decree 81/08 and subsequent amendments (internally).
- Hazardous substances: the company strictly controls materials that contain potentially hazardous substances, including: used lubricating oil, lubricating greases, enamels, paints, thinners, solvents, fuels.
- Diffuse dust: present in paste mixture milling and atomizers work centres, these emissions consist of dust. Annual checks are carried out on workers' exposure, in accordance with ACGIH and Italian national standards. Raw materials loading-unloading yards are covered, and cleaning is carried out by mechanical means owned by the company. A person is responsible for the daily cleaning of the floor of the plant by means of automatic scrubbers and floor cleaners.
- Asbestos: the main production plant (area A of Fig.1.1) consists of six blocks with Eternit roof covering. Various safety interventions have been carried out on these roof coverings: in 2003 and 2010, interventions were carried out by a specialized company that treated the roof coverings with special inert coatings and partially contained them with insulated metal panels.
In 2020 about 360 square meters of Eternit roof coverings were removed and disposed of in the area around Granital.
In 2022 the asbestos present in the Eternit roof coverings was then remapped and evaluated according to guidelines laid down by the Emilia-Romagna Region with regard to the state of conservation.
The investigation was also extended to the work areas below the roof coverings, to check for any presence of air-dispersed fibres.
- Spent oils: deriving from ordinary and extraordinary maintenance activities on hydraulic presses and lubricated screw compressors. Given the quantities, a tank with a volume of 1300 litres was placed in the plant where the waste oils are stored before disposal.
- Greenhouse-effect ozone-depleting substances: there are refrigeration and air conditioning systems containing greenhouse gases. In particular, there are three plants containing R22 gas in quantities exceeding 3kg.
- Greenhouse gas emissions: the company is part of the European scheme for the management and control of greenhouse gas emissions (ETS), with particular reference to the trading of CO2 emission shares, for the reference period 2021-2025.

5.2 Non-significant direct aspects

- Surface water bodies: the only body of water near the production plant is the Rio Fantino stream, but this aspect is not considered significant given the very low probability of contamination of the same with dangerous substances deriving from the activities of Cerdomus.
- Induced traffic: the vehicular traffic deriving from the activities of the production plant does not significantly alter that already present on the roads connecting to the site, since these are the main high traffic arteries (SS Emilia and S.P. Borello).
- Visual impact: the production site and the shipping warehouse are in an already industrialized area and do not significantly alter the landscape.

- State of the soil: both the production plant and the shipping warehouse are built on waterproofed surfaces using asphalt and concrete. The risk of soil contamination is therefore not significant.
- Radioactivity of raw materials, finished product: raw materials used for the paste mixture and consequently the finished product do not present dangerous levels of radioactivity, as shown by the analyses carried out regularly for product certifications required for export to countries outside the EU.
- PCT and PCB: in the production plant, in the medium-voltage receiving and low voltage distribution cabinets, there are seven oil transformers that originally contained PCBs. These transformers were reclaimed during the year 1999 and the verifications carried out in April 2013 confirm the absence of PCBs. There are no installations containing PCT.
- Electromagnetic fields: there are no devices in the production plant or shipping warehouse that generate significant electromagnetic fields, except in non-operational areas, where only informed, trained and specialized personnel can access.
- Waste water discharge: waste water produced is entirely recycled and reused within the production cycle, after treatment in the purifier. Civil waste water is channelled into the Rio Fantino stream water body after separation of the solids in Imhoff tanks. For the shipping warehouse, there is a Single Environmental Authorization for the discharge of domestic waste water not entering the sewerage network issued by the province of Ravenna: AUA No 3173 valid for 15 years.

5.3 Indirect environmental aspects

- Disposal of waste / hazardous substances: check of authorizations of collection and disposal centres responsible for waste collection and verification of authorizations and the suitability of the means of transport used for collection.
- Noise: companies that provide services to Cerdomus are made aware of the environmental aspect under consideration during pre-construction coordination meetings.
- Diffuse dust: companies that provide services to Cerdomus are made aware of the environmental aspect under consideration during pre-construction coordination meetings.
- Environmental performance and practices of contractors and suppliers: preparation of contracts suitable for monitoring activities carried out, delivery of specific instructions relating to environmental aspects. In addition, a declaration of commitment to compliance with environmental standards, monitoring of activities, in particular on waste storage, is required. Also the DUVRI (Single Document On Risks Generated By Interference Between Activities Conducted Simultaneously In The Same Workplace) will be delivered.
- Product packaging disposal: the packaging used consists of stretch film, wooden pallets and cartons. Wood pallets are intended for subsequent reuse, or energy recovery, while paper and plastic packaging, being non-hazardous waste, are intended for subsequent recovery. The company reports on the cardboard packaging indications of recyclability and recovery.
- Product disposal: the finished product, once its life cycle is over, can be disposed of as non-hazardous waste and can be recycled as a filler for environmental restorations, road surfaces and earthworks.

6. CONSUMPTION OF NATURAL RESOURCES

The resources that the site uses for its activities are:

- WATER
- ENERGY

- RAW MATERIALS

These resources refer to tile production as shown in table 6.1.

Table 6.1 - Annual production of finished product deposited in warehouse –

Year	Production in tonnes	Production in m ²
2020	51,785	2,251,506
2021	67,604	2,939,314
2022	68,331	2,970,898
2023	68,644	2,984,523

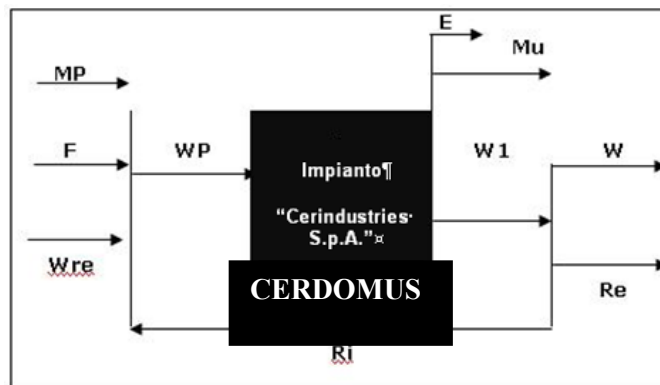
Due to the search for new markets and the sale of products already in stock in the warehouse, production levels were lower in 2019 and 2020 than in 2021, when there was a significant increase in production levels. This was partly due to the capacity of sales management to open up new sales channels and markets, and also thanks to a higher number of agents coming from the Cerdomus Academy project; these levels remained practically the same in 2022 and 2023, confirming what was achieved in the previous year.

6.1 Water

External supply waters are:

- Industrial water taken from private wells, duly reported (two for processing water and two used exclusively for fire fighting), used in the production stages both as raw material and for washing and cooling systems;
- Industrial water from other companies that do not have the equipment for the purification and reuse of the same (currently not active);
- Drinking water of the civil aqueduct, used for all the toilets of the site;
- Purified water generated by the in-house industrial waste water purification process, reused in the production process in the grinding phase for raw materials.

Fig. 6.2 — Water Balance —



Legend

F = Water consumption	W1 = Produced waste water
WP = Overall water requirement	W = Waste water intended for discharge
MP = Water content in the incoming material	Mu = Water contained in the materials
Ri = Waste water recycled internally	Re = Waste water recycled externally
Wre = Waters from third parties	E = water evaporated

Rainwater falling in the open areas used exclusively for storing finished products (ceramic tiles boxed on pallets and shrink-wrapped) and the car park for staff and customer vehicles, is partly channelled into the public drains and partly drained into the surface waters in the Fantino Stream (a single drain that also discharges domestic waste water). Some of the rainfall that collects in the covered courtyard where raw materials are stored is also

channelled into several holding tanks, sent to the water treatment plant using booster pumps, and then used as grinding water.

The sludge from the process of purifying water from the atomization, enamel milling, and glazing work centres is recovered and reintroduced into the production process directly during the milling phase of the raw materials that make up the mixture, while the purified water is stored in tanks and reused, mixed with well water, as milling or washing water by the production work centres.

Instead, the waste water from the polishing/grinding/cutting department is purified using a new water clarification and microfiltration plant; the sludges are then filter-pressed and the clarified water is returned into the cycle, replenished as needed with well water.

Table 6.3 - Water intake: source, uses, destination and information on recovery or recycling –

Source	Main uses	Final destination	Possibility of recovery/recycling
Private wells	Raw material for loading paste mixture mills	Evaporation as a result of the atomization process and during firing	/
	Washing atomizers	Use as milling water	Use as milling water
	Raw material for loading enamel mills	Evaporation in firing	/
	Washing of enamel preparation mills	Sending to purification plant	Use as milling and washing water
	Washing work centres	Sending to purification plant	Use as milling and washing water
	Replenishing processing water of polishing/grinding/cutting work centre	Sending to polishing/grinding/cutting plant	Fully recovered and recycled
From third parties	Raw material for loading paste mixture mills	Sent to the purification plant	Use as milling and washing water
First rain water	Raw material for loading paste mixture mills	Purification plant	Use as milling and washing water
Public Aqueduct	Civil use	discharge into surface water	/

Table 6.4 - Water consumption, production in t and m² and specific index -

Year	Water consumption m ³	Finished Product t	Specific consumption m ³ / t F.P.	Finished Product m ²	Specific consumption m ³ / 100m ² F.P.
2020	42,416	51,785	0.82	2,251,506	1.88
2021	47,517	67,604	0.70	2,939,314	1.62
2022	42,783	68,331	0.63	2,970,898	1.44
2023	43,333	68,644	0.63	2,984,523	1.45

In 2021, water consumption increased by approximately 12% compared to 2020, despite a 30% increase in production stored in warehouses. This is due mainly to a more rational use during the paste mixture grinding phase, differentiating the type of raw materials entering the paste mixture grinding mills. In 2022 and 2023, despite having maintained production just below 3 million m², water consumption fell compared to 2021, both due to the dismantling of

the 4 traditional glazing lines and the entry into operation (in 2023) of the 2 grinding and dry cutting lines.

6.2 Energy

Energy consumption has always been an extremely significant aspect for the ceramic industry, considering that 25% of the industrial cost is attributable to energy costs (electricity and natural gas).

For the activities of the production plant, Cerdomus buys the following energy carriers from third-party suppliers: electricity and natural gas. CERDOMUS currently has 1 operational 2.5MWe cogeneration plant, which was commissioned on 16/10/2023, while at the moment it has no energy production from renewable sources of any kind.

6.2.1 Electricity

Mains electricity is supplied by EDISON Energia; until October 2021, a 3.6MWe cogeneration plant was in operation at the site which contributed 90% of the facility's energy needs; from the decommissioning of the plant until October 2023, all of CERDOMUS's electricity requirements have been met through mains electricity. The new 2.5MWe cogeneration plant was activated in 16/10/2023, and produces electricity and thermal energy used entirely in the atomisation process.

In the following Table 6.5 the detail of consumption.

Table 6.5 – Electricity consumption and self-consumption –

Year	Electricity taken from the grid (kWh / year)	GJ	Self-consumed electricity (kWh / year)	GJ	Electricity used (kWh / year)	GJ
2020	3,697,494	13,311	11,111,028	40,000	14,808,522	53,311
2021	8,158,584	29,371	9,198,069	33,113	17,356,653	62,484
2022	16,051,716	57,787	0	0	16,051,716	57,787
2023	12,913,644	46,489	3,448,604	12,415	16,362,248	58,904

From previous table, we can see that in 2020, self-produced and self-consumed electricity was equal to 67% of annual requirements; in 2021 this percentage was significantly reduced to reach 11% of the energy used due to the decommissioning of the old cogeneration plant, which was deactivated in September 2021 to allow the installation of the new 2.5MWe cogeneration unit; throughout 2022, mainly due to the exceptional trend in natural gas market prices, the new cogeneration plant was not used and, consequently, the entire electricity needs of the plant were met by the grid. In 2023, the new cogenerator was put back into operation in October and, for this reason, the percentage of self-produced and self-consumed electricity began to grow again, reaching approximately 26% of the plant's annual requirement.

This variation in the incidence of self-consumed energy on total energy derives from the annual operating hours of the cogeneration plant closely linked to the production of the atomizer connected to it and, in general, to the production structure of the plant. In 2020 the numbers of self-produced and self-consumed electricity were high as, despite the shutdown due to COVID-19 (pursuant to Prime Ministerial Decree, the entire plant was shut down for 6 weeks, from 23/03/2020 to 04/05/2020), market demand increased significantly compared to 2019 and the old 3.6MWe cogeneration plant was used for all months of production.

In 2021, the data is completely different from the previous year: electricity taken from the grid has significantly increased, and the percentage of self-consumed electricity has dropped to around 11% of the energy used. This is due to various factors: first of all, the increase in demand recorded in 2019 and 2020 was confirmed and increased further in 2021, to the extent that the site's third kiln was returned to operation, after being out of use since April

2017; this led to an increase in the hours of operation for the plants, and in particular, the atomizer, which entailed an increase in the overall energy requirements of the facility. Conversely, the operation of the cogeneration plant dropped significantly in 2021: the 3.6MWe plant in operation in January 2021 was used only until September of the same year, when the particular conditions of the energy markets made it economically inconvenient to use cogeneration plants. Subsequently, in October 2021, the plant was decommissioned to allow the installation of the new 2.5MWe cogeneration unit, whose construction ended in December 2021, but, as expected, the plant did not come into operation until October 2023. During 2022, no cogeneration plant was in operation (the installation of the new cogeneration plant had been completed, but the cost of natural gas did not make using the plant convenient), the entire requirement of the plant was met by electricity distributed by the grid: during this year, the plant layout of the plant was significantly modified. A plant renovation began in 2022, for the purpose of eliminating four traditional pressing and glazing lines, a 94.4 m long single-layer roller firing oven, two wet cutting and grinding lines and a heat shrinking line for packaging pallets of finished product. They were replaced with: complete new generation production line consisting of a continuous roller press, horizontal dryer, glazing line for large sizes, a single-layer 164.4 m long firing oven, two dry cutting and grinding lines and a new heat shrinking system for large sizes. Beyond the operation of the cogeneration plant, it is for this reason that in 2022 the plant's energy needs declined, despite market demand remaining high and at good levels. In 2023, apart from the restart of the cogeneration plant in October 2023, which marginally affected the overall energy used from the grid, an increase in the plant's energy needs was recorded resulting from the start-up of the new plant (from May 2023) and the consequent increase in the operating hours of the atomizer, which was required to address production increase.

6.2.2 Thermal energy

Natural gas is supplied by EDISON Energia; in the following Table 6.6 the detail of consumption.

Table 6.6 –Natural gas consumption –

Year	Total consumption (including services) (Sm ³)	GJ	Consumption for cogeneration (Sm ³)	GJ
2020	9,544,918	336,754	3,413,946	120,447
2021	10,970,373	387,045	2,693,647	95,034
2022	8,281,708	292,187	0	0
2023	9,137,670	322,385	1,003,493	35,404

Similarly to the dynamics described for electricity, methane consumption was also significantly influenced by the hours of operation for the plants, trends in the facility's pace of production and the operation of the cogeneration plant. Also in this case, it can be observed that in 2020 and 2021 the total and specific consumption of the cogeneration plant achieved the maximum values of the four-year period: in 2020, despite production stoppage due to COVID-19, because it is the only year of the period considered in which the cogeneration plant operated throughout the year, during all productive months; in 2021 the total consumption of methane grew significantly, despite the fact that the methane used for cogeneration was decreasing due to the greater demand for methane by the production plants following the restart of the third furnace and the shutdown of the cogeneration plant in October 2021.

In 2022, however, the natural gas consumed dropped significantly compared to previous years: this is due to the fact that during the entire year no cogeneration plant was in operation and the total numbers from the distribution network matched the numbers required to power the production plants and which, if compared to the total gas consumption used in 2021, except for cogeneration use, was in line with previous year figures.

During 2023, an increase in the volumes of methane consumed can be noted, mainly due to the activation of the new cogeneration plant in October 2023, and to the new plant/production structure resulting from the installation of the new CONTINUOUS line. The total value of methane consumption for 2023, minus the volumes consumed by the cogenerator, was in fact in line with consumption in 2022, despite the new plant being commissioned in May 2023.

6.2.3 Energy Balance

Table 6.7 - Energy balance: parameters and indicators for evaluation -

Metrics	Unit of measurement	Indicators 2020	Indicators 2021	Indicators 2022	Indicators 2023	B.A.T. ceramics (complete cycle)
Average specific consumption of natural gas referred to the finished product unit	GJ/t	6.51	5.73	4.28	4.7	6.5
Average specific consumption of electricity per unit of finished product	GJ/t	0.26	0.44	0.85	0.68	6.5
Average total specific consumption of energy per unit of finished product	GJ/t	6.76	6.16	5.13	5.38	6.5

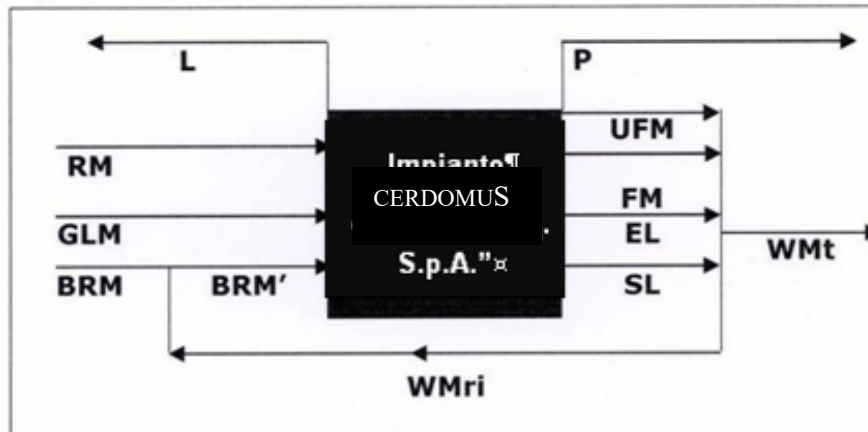
From the indicators reported in this table it can be seen that the average total specific energy consumption decreased from 2020 to 2022, undergoing a trend reversal during 2023: this is due to the fact that in 2020, production was concentrated into only two kilns because of the significant drop in demand, and, consequently, the hours of operation of the plants, with a resulting increase in the inefficiency of the facility. Instead, from 2021 onwards, we can see an inversion of the trend, with a drop in specific energy consumption. In 2021, thanks to a consolidation of the increase in demand, the third kiln installed on site, which had been out of use since April 2017, was returned to operation. As shown in Tab. 6.5 and 6.6, this led to an increase in the site's energy requirements, but also increased the efficiency of production thanks to a reduction in system downtime. This data was also confirmed in 2022, despite the lack of cogeneration plants in operation, as the average total specific consumption was at its lowest in the four-year period, equal to around 24% lower than the maximum value reported in 2021; this data is also in line with the B.A.T. ceramics (complete cycle). From the indicators from 2021, and even more so from 2022, we can also see an increase in the average specific consumption of electricity, and a drop in the consumption of natural gas, due to a higher amount of electricity taken from the grid because of both an increase in requirements and the decommissioning of the cogeneration plant in October 2021. In 2023 there was a slight reversal of the trend with total specific consumption increasing compared to 2022, but still lower than 2022 and 2021: as can be seen from the previous table, the specific consumption relating to electricity decreased compared to 2022, while the specific consumption relating to natural gas increased. This is due to: in the first case, the activation of the new cogeneration plant and the related self-produced and self-consumed electricity, which reduced the quantity of electricity from the grid; in the second case, once again, the start-up of the cogeneration plant powered by natural gas (used for the production of electricity and not directly for the creation of the finished product) and the start-up of the new production line. Indeed, in May and June 2023, the new plant produced at a reduced capacity during the start-up and testing period, which implied low production efficiency and, in some periods, the switching on of thermal machines (and, consequently, the consumption of natural gas) without the creation of any finished products.

6.3 Raw Materials

Raw materials used both of clay origin and sand origin have a humidity percentage of generally between 5% and 18% upon arrival.

The diagram below shows the balance of materials in a dry state on site and materials inflows and outflows. The focus here is on the product and the flows of materials that are most directly or potentially associated with it.

Fig. 6.8 –Materials quantities sheet –



RM = Reagenti	P = Prodotto finito
GLM = Materie prime per smalti	UFM = Scarto crudo
BRM = Materie prime per supporto	FM = Scarto cotto
BRM' = Materiali riciclati internamente	EL = Reagenti esausti
WMri = Materiali riciclati internamente	SL = Fanghi (da trattamento acque)
	WMt = Materiali (rifiuti) in uscita totali = = WMre , materiali riciclati esternamente + WMd , materiali destinati alla discarica)
	L = perdita al fuoco ed altre perdite (per differenza, con analisi di congruità)

The following circumstances are noted:

- Raw waste (**UFM**) (air purification dust, raw tile waste and water purification sludge) is stored in a covered area and partly recovered in the production of atomized product, while the rest is sent for recovery through authorized disposal companies.
- All fired waste (**FM**) is sent for recovery through authorized disposal companies.

Table 6.9 - Raw materials: phase, type, physical appearance and main constituent elements -

Phase	Type raw materials	Aspect appearance	Main constituent elements
Preparation of paste mixture	Clays, sands, feldspars, kaolin	Powdery granular solid	Clay minerals, quartz, feldspars
	Dyes and pigments	powdery	Colouring metallic oxides

Phase	Type raw materials	Aspect appearance	Main constituent elements
Preparation of enamels, silk-screen pastes and glazing	Frits	Granular and in flakes	Silico-aluminates or silicates or silico-borates of: alkaline earth metals and / or other metallic elements obtained in a combination of different substances during their fusion
	Inorganic raw materials	Powdery	Alumina, kaolin, clays, metal oxides, feldspars
	Organic additives (vehicles-oils)	Liquid	Water, water soluble glycols, polymers of natural origin
	Pigments	Powdery	Low solubility inorganic solids derived from carbonates, silicates and oxides

The raw materials used in the plant are also checked for safety. Clays, sands and feldspars for paste mixture are natural quarry materials, to which no risk phrase is generally associated.

The raw materials for paste mixtures, enamels, dyes, and various reagents are chemical products for which the company reports the amount purchased, the risk phrases, the percentage of the chemical elements contained in the product on the company database for management in the future (e.g. chemical risk assessment).

Cerdomus S.r.l. has at its disposal all the safety data sheets relating to the raw materials purchased (stored in the Technical Office) and these are managed according to procedure by the PRPP (Person Responsible for Prevention and Protection).

All raw materials and semi-finished products are stored inside the sheds and this rule is extended to all products used for production in order to avoid any possibility of spillage to the environment.

The main flows of the balance of dry materials presented in Fig.6.8 are explained in the following Table 6.10.

Table 6.10 – Input raw materials and weight per m² –

Year	Consumption Raw materials (t)	Finished Product (m ²)	Quantity of raw materials per unit of finished product (kg / m ²)
2020	55,368	2,251,506	24.6
2021	70,348	2,939,314	23.9
2022	69,729	2,970,898	23.5
2023	72,951	2,984,523	24.4

Since 2017, recycled material has begun to be used in the mix, and in particular fired waste (eco-chamotte) introduced in percentages of up to 2%. Since September 2020, for some types of paste, the waste produced internally by the polishing/grinding/cutting department (cutting sludge) has also been added in a proportion up to 20%, after filter-pressing; before, this was sent for recovery by an authorized company. Since 2020, all the raw waste produced internally has also been recovered in the production cycle. From 2020 until 2022 this resulted in a decline in the raw materials use index per unit of finished product. Due to the outbreak of the war in Ukraine and the consequent difficulty in locating the Ukrainian clays that Cerdomus predominantly used in its mixture grinding, it was necessary to provide for a mixture reformulation, with the consequent forced interruption of the percentage of waste recovery (sludge cutting), which would have undermined the stability and quality of our final product. Therefore, the rate of use of raw materials per unit of finished product was on the rise in 2023.

7. WASTE WATER DISCHARGE

As documented in the previous Chapter 6, at the production plant of Cerdomus S.r.l. there are no outward flows of industrial waste water from the production cycle.

All industrial waste water is sent to the water treatment plants and reused in processing while the water from the toilets flows into the surface water collection point as per permit to discharge civil water (as regards the settlement identified by Area A of Fig.1.1), issued by the municipality of Castel Bolognese by Prot. No. 14504 of 6 Dec.2004, valid for four years and renewing automatically.

Regarding the shipping warehouse located in via Calamello 1035 (Area B of Fig.1.1), there is a Single Environmental Authorization for the discharge of domestic waste water not discharged into the sewerage network, issued on 20/10/2015 by the province of Ravenna: AUA no. 3173 of 20/10/2015, valid for 15 years.

8. DANGEROUS SUBSTANCES AND PRODUCTS

The following materials shall be considered as such and kept under control:

- **LUBRICATING OIL AND GREASE:** the stocks of these materials are placed within specific areas and have a maximum amount of storage of five drums with a capacity of 180 litres each, all positioned in containment basins. They are purchased only when needed.
- **ENAMELS:** these substances consist of oxides of metals and other substances which have been properly ground, dissolved in water and kept in suspension by means of agitators. When not used in production they are stored in special areas; they form the basis for the colouring and decoration of tiles. Approximately 300 t of raw materials are used for enamels every year.
- **INKS FOR DIGITAL DECORATORS:** used for decorating products and already supplied in 1 m³ tanks and small closed 5-liter containers. When not used in production they are stored in special areas near the glazing lines. Ink wastes are disposed of with EWC code 080312* while empty containers are disposed of with EWC code 150110*. About 35 t of digital inks are used per year.
- **PAINTS, THINNERS AND SOLVENTS:** about 20 litres of solvent substances are stored on the site at the spare parts warehouse and the sample work centre; usually they are purchased as required without large storage capacity.
- **FUELS:** stored in special tanks. Specifically, there are: one above-ground tank for automotive diesel fuel to supply forklifts and loaders; four above-ground tanks for diesel fuel to supply emergency power generators. In the shipping warehouse, there are two above-ground tanks for automotive diesel oil (forklifts). Approximately 16,000 kg of diesel oil are used per year.
- **LPG:** stored in special storage cages ventilated and placed under lock; on average there are 10 cylinders at the main plant and 20 at the shipping warehouse. In both cases, the cylinders are used for the heat shrink of plastic protective packaging.
At the shipping warehouse, there is a tank with a capacity of 5000 litres, on loan for use from Autogas Nord, used for heating the processing area inside the samples warehouse.
- **PCB:** PCB-containing transformers are no longer used in the company, as they have been gradually remediated and/or replaced with equipment that does not contain such substances.
- **CHEMICAL REAGENTS:** used in the water treatment plant, they are stored in special containers.

9. EMISSIONS INTO THE ATMOSPHERE

The risk of introducing polluting substances into the atmosphere is associated mainly with the **channelled emissions** throughout all production operations.

There are **diffuse**, dust emissions, mainly associated with locations where raw waste is collected and raw materials are moved.

Attempts are being made to limit this phenomenon by frequent cleaning of both the production work centres and of the raw material unloading yards, with the use of automatic scrubbers and floor cleaners used by internal personnel.

In 2007 and the following year the old dust collection containers from the purifiers were replaced with collection tanks. The particulates are dissolved in water and sent directly to the milling so as to significantly reduce the dustiness due to transport and storage, in the appropriate boxes, of the collection vessels.

Table 9.1 on the following page lists the authorised emissions, all of which are associated with polluting substance filtration and abatement plants.

All gaseous emissions are subject to an integrated environmental authorisation (AIA), provision DET-AMB-2023-2288 del 05/05/2023, DET-AMB 728 of 16/02/2022, DET-AMB 2450 of 23/05/2019 and DET-AMB-2019-3996 of 02/09/2019 (minor amendment), issued by ARPAe Ravenna - SAC, which expires on 18/08/2025.

The main pollutants are: particulate material, fluorine compounds and lead compounds. The authorization conditions also include other pollutants, in particular nitrogen oxides (NO_x, expressed as NO₂), sulphur oxides (SO_x, expressed as SO₂), volatile organic substances (VOS, expressed as total organic carbon) and the aldehydes.

The systems for purifying the firing fumes coming from the kilns are fabric sleeve filters (usually Teflon-coated Nomex - 500g / m²) with solid reagent pre-coating (calcium hydroxide used for fluorine absorption).

Filtration systems for dust from the production work centres are equipped with polyester fabric sleeves of 500g/m².

The values entered in Table 9.1 are extrapolated from analytical reports and inserted in spreadsheets made available by the Emilia Romagna Region, which take into account sampling point, date, temperature, values and normalized flow rates of the single emission point.

In Tables 9.2, 9.3, 9.4, 9.5 and 9.5A data on Authorised Mass Flows of pollutants, data measured on installations during self-checks carried out by an accredited ACCREDIA Laboratory and, in the last column, the Emission Factors expressed in g/ m² of finished product deposited in the warehouse are reported.

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Table 9.1 – Summary of gaseous emissions –

Emission point	Controlled pollutant type	Authorized limit in mg/Ncm
Dryers E1 – E3 – E8 – E9 – E10	Particulate material	5
	Fluorine	2.5
	Lead	0.3
	Nitrogen oxides (Nox)	100
	Sulphur oxides (Sox)	250
	CO	50
Dryer E11	Particulate material	5
	Fluorine	3
	Lead	0.3
	Nitrogen oxides (Nox)	100
	Sulphur oxides (Sox)	250
	CO	60
E19	Particulate material	20
E21	Particulate material	20
E22	Particulate material	5
	Fluorine	5
	Lead	0.4
	Nitrogen oxides (Nox)	200
	Sulphur oxides (Sox)	500
	Organic carbon (VOS)	50
	Aldehydes	20
E23	Particulate material	20
	Fluorine	3
	Lead	0.3
	Nitrogen oxides (Nox)	350
	Sulphur oxides (Sox)	35
E24	Particulate material	20
E27	Particulate material	10
E29	Particulate material	20
E30	Particulate material	15
	Fluorine	3
	Lead	0.3
	Nitrogen oxides (Nox)	350
	Sulphur oxides (Sox)	35
E32	Particulate material	5
E33	Particulate material	5
E34	Particulate material	20
E37	Particulate material	10
E38	Particulate material	6
E40	Particulate material	10
E42	Particulate material	20
E46	Particulate material	5
	Fluorine	5
	Lead	0.4
	Nitrogen oxides (Nox)	200
	Sulphur oxides (Sox)	500
	Organic carbon (VOS)	50
	Aldehydes	20
E47	Particulate material	10
E48	Particulate material	10

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Table 9.2 – Polluting emissions 2020 –

POLLUTANT	No. of emission points for each pollutant	Authorised annual mass flow per pollutant [kg/year]	Annual average Mass Flow from self-checks for each pollutant [kg/year]	Emission factor for each pollutant [g/m ²]
Particulate material	22	48,824	2,893	1.28
Lead	11	641	3	0.001
Fluorine	11	6,412	505	0.22
VOS	2	23,652	1,016	0.45
Aldehydes	2	9,461	69	0.03
Sulphur oxides	11	388,199	56,669	25.17
Nitrogen oxides	11	476,106	9,735	4.32
CO	7	23,652	2,229	0.99
Crystalline silica	1	2,015	-	-

Definition	Value
Authorised total annual mass flow [kg/year]	978,962
Total annual average mass flow from self-checks [kg/year]	73,119
Production discharged in warehouse [m ² /year]	2,251,506

Table 9.3 – Polluting emissions 2021 –

POLLUTANT	No. of emission points for each pollutant	Authorised annual mass flow per pollutant [kg/year]	Annual average Mass Flow from self-checks for each pollutant [kg/year]	Emission factor for each pollutant [g/m ²]
Particulate material	22	48,298	2,426	0.82
Lead	11	589	6	0.002
Fluorine	11	5,887	223	0.08
VOS	2	18,396	4,533	1.54
Aldehydes	2	7,358	739	0.25
Sulphur oxides	11	335,639	40,801	13.88
Nitrogen oxides	11	455,082	17,110	5.82
CO	7	23,652	-	-
Crystalline silica	1	2,015	-	-

Definition	Value
Authorised total annual mass flow [kg/year]	896,916
Total annual average mass flow from self-checks [kg/year]	65,838
Production discharged in warehouse [m ² /year]	2,939,314

Table 9.4 – Polluting emissions 2022 –

POLLUTANT	No. of emission points for each pollutant	Authorised annual mass flow per pollutant [kg/year]	Annual average Mass Flow from self-checks for each pollutant [kg/year]	Emission factor for each pollutant [g/m ²]
Particulate material	22	48,298	2,368	0.80
Lead	11	589	1	0.0003
Fluorine	11	5,887	379	0.13
VOS	2	18,396	3,794	1.28
Aldehydes	2	7,358	577	0.19
Sulphur oxides	11	335,639	42,190	14.2
Nitrogen oxides	11	455,082	21,437	7.22
CO	7	23,652	2,487	0.84
Crystalline silica	1	2,015	-	-

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Definition	Value
Authorised total annual mass flow [kg/year]	896,916
Total annual average mass flow from self-checks [kg/year]	73,233
Production discharged in warehouse [m ² /year]	2,970,898

Table 9.5 - Polluting emissions for 2023 referring to AIA-DET-AMB authorisation no. 1401 and no. 728 (replaced during 2023, by the current AIA no. 2288) -

POLLUTANT	No. of emission points for each pollutant	Authorised annual mass flow per pollutant [kg/year]	Annual average Mass Flow from self-checks for each pollutant [kg/year]	Emission factor for each pollutant [g/m ²]
Particulate material	22	48,298	3,260	1.09
Lead	11	589	-	-
Fluorine	11	5,887	398	0.13
VOS	2	18,396	1,440	0.48
Aldehydes	2	7,358	203	0.07
Sulphur oxides	11	335,639	-	-
Nitrogen oxides	11	455,082	-	-
CO	7	23,652	-	-
Crystalline silica	1	2,015	-	-

Definition	Value
Authorised total annual mass flow [kg/year]	896,916
Total annual average mass flow from self-checks [kg/year] <u>integrated environmental authorisation AIA DET AMB no. 1401 and no. 728</u>	5,301
Production discharged in warehouse [m ² /year]	2,984,523

Table 9.5 A - Polluting emissions for the year 2023 referring to AIA-DET-AMB authorisation no. 2288 of 05/05/2023 in force-

POLLUTANT	No. of emission points for each pollutant	Authorised annual mass flow per pollutant [kg/year]	Annual average Mass Flow from self-checks for each pollutant [kg/year]	Emission factor for each pollutant [g/m ²]
Particulate material	24	48,255	924	0.31
Lead	10	565	5	0.002
Fluorine	10	5,877	639	0.21
VOS	2	18,396	4,657	1.56
Aldehydes	2	7,358	14	0.005
Sulphur oxides	10	326,945	17,305	5.80
Nitrogen oxides	10	451,604	22,299	7.47
CO	6	23,472	2,239	0.75
Crystalline silica	1	2,015	-	-

Definition	Value
Authorised total annual mass flow [kg/year]	884,490
Total annual average mass flow from self-checks [kg/year] <u>integrated environmental authorisation AIA DET AMB no. 2288</u>	48,081
Total annual average mass flow from self-checks [kg/year] <u>VALUES SUM integrated environmental authorisation AIA no. 2288 no. 1401 and no. 728</u>	53,382
Production discharged in warehouse [m ² /year]	2,984,523

9.1 Greenhouse gas emissions

Table 9.6 – Greenhouse gas emissions –

Year	Consumption of natural gas [Sm ³ / year]	CO ₂ emission [t/year]
2020	9,544,918	19,071 **
2021	10,970,373	21,915 **
2022	8,281,708	16,630**
2023	9,137,670	18,467 **

**Certified CO₂ emissions.

CO₂ emissions, for the years up to 2012, have been calculated taking into consideration only those coming from the combustion of natural gas.

Starting from 2013, with the inclusion of companies in the ceramic sector in the ETS system for the period 2013-2020, CO₂ emissions were calculated as required by law (Italian Legislative Decree 30/2013) and checked by external body, see Table 9.6. Below are the references for Cerdomus regarding the emission trading scheme and the results of the checks carried out:

Plant authorisation No.: 2256

Unique identifier No.: IT000000000205244

Certifying body: Certiquality s.r.l.

ETS emission data validation - 2020: 624/1/21, audit on 10/02/2021

ETS emission data validation - 2021: 624/1/22, audit on 04-05/04/2022

ETS emission data validation - 2022: 624/2/23, audit on 25/03/2023 and 04-05/04/2023

ETS emission data validation - 2023: 624/2, audit on 25/03 and 03-04/04/2024

10. WASTE

Below is the list of waste produced at the production site, EWL codes, type, classification, type of waste, state, destination and annual production in kg for 2020 to 2023.

Table 10.1 - Waste identification and production data -

EWL Code	p	Type Waste	State	D	Prod. 2020 (Kg)	Prod. 2021 (Kg)	Prod. 2022 (Kg)	Prod. 2023 (Kg)
150101		Paper and cardboard	S	R	32,690	48,110	64,570	83,490
150102		Plastic	S	R	57,060	74,870	68,190	61,040
150103		Wood	S	R	170,090	102,730	153,320	107,170
150106		Mixed packaging	S	R	80,490	127,540	92,080	124,390
200301		Unsorted urban waste	S	R	-	-	10,660	26,720
170405		Iron and steel	S	R	41,280	51,540	82,990	55,800
170411		Copper cables	S	R	-	-	2,600	-
101201		Mixture residues (raw waste)	S	R	385,100	-	-	-
101203		Dust and particulate matter	DS	R	-	-	6,330	1,213,320
101208		Waste ceramics (fired waste)	S	R	1,441,920	1,852,900	1,852,670	2,269,310
080203		Aqueous suspensions cont. ceramic materials	SSS	R	-	-	16,400	-
080202		Aqueous sludges containing ceramic materials - sludges from cutting	SSS	R	1,272,420	38,780	1,622,420	808,840
170904		Construction and demolition waste	S	R	-	68,060	90,020	-
161106		Refractories	S	R	25,220	12,400	15,720	19,840
160304		Inorganic waste other than waste referred to in row 160303	S	R	-	-	-	30,000
170604		Different insulating materials	S	S	3,720	-	-	-
160214		Electronic equipment no longer in use	S	R	751	520	-	743
170802		Gypsum-based construction materials	S	R	-	360	640	-
200101		Paper and cardboard, archive material to be pulped	S	R	-	8,320	-	-
Total non-hazardous waste sent for recovery				R	3,507,021	2,386,130	4,078,610	4,800,663
Total non-hazardous waste sent for disposal				S	3,720	-	-	-
150111*	p	Spent spray cans	S	R	-	-	160	-
130205*	p	Spent oil	L	R	1,200	4,140	2,240	4,240
101209*	p	Spent lime	DS	S	42,220	39,320	49,680	37,980
150202*	p	Absorbents, Filter sleeves	S	R	2,228	1,290	1,512	1,600
060201*	p	Calcium hydroxide	DS	S	4,680	-	-	-
120109*	p	Oily emulsions	L	S	-	8,200	5,840	3,360
170603*	p	Other insulation materials	S	S	130	4,680	1,223	1,800
200121*	p	Neon fluorescent tubes	S	R	154	200	161	145
160211*	p	Electronic equipment	S	R	36	40	-	-
150110*	p	Packaging cont. haz. subst.	S	R	970	810	450	730
080312*	p	Inks cont. haz. subst.	L	S	1,317	1,280	1,170	3,414
160121*	p	Hazardous components	S	S	-	-	-	212
160107*	p	Oil filters	S	R	-	210	-	-
161105*	p	Refractories cont. hazardous substances	S	S	-	-	1,540	-
160213*	p	Electronic equipment-monitors	S	R	-	-	167	120
160601*	p	Waste lead acid batteries	S	R	2,800	2,513	-	2,250
120112*	p	Spent waxes and fats	SSS	S	-	60	55	-
160708*	p	Waste containing oil	L	S	21,120	-	-	-

061302*	p	Spent activated carbon	S	S	-	70	-	-
161001*	p	Aqueous waste solutions cont. hazardous substances	L	S	-	33,120	-	-
Total hazardous waste sent for recovery				R	7,388	9,203	4,690	9,085
Total hazardous waste sent for disposal				S	69,467	86,730	59,508	46,766
Total waste produced					3,587,596	2,482,063	4,142,808	4,856,514

Legend: **h** = Hazardous waste **d** = Destination (**R**: Recovery, **Di**: Disposal) State: **L** = Liquid, **S** = Solid, **DD** = Dusty, **SSS** = Semi-solid sludge

The raw waste material bearing EWC code 101201, fired waste bearing EWC code 101208, cutting powder waste bearing EWC code 101203 and cutting sludge bearing EWC code 080202, are treated as waste and are delivered to and recovered externally by authorised disposal companies, for the proportion exceeding the quantities recoverable within the production cycle.

The above quantities refer to the total waste produced both at the production site of Via Emilia Ponente (Area A of Fig.1.1), and in the warehouse of Via Calamello (Area B of Fig.1.1), and extrapolated from the Standard Form Of Environmental Declaration (*Modello Unico di Dichiarazione ambientale* (MUD)) which is transmitted annually to the Chamber of Commerce, Industry, Crafts and Agriculture (CCIAA) of Ravenna.

Compared to 2020, the data reported above shows a marked decrease in waste delivered, being such waste mainly from the minor “generation” of EWL 101201 raw waste and EWL 080202 ceramic cutting sludge, resulting from a decrease in the production levels of finished product stored in the warehouse, and, above all, the increase in the percentage of recovery of waste within the production cycle (for 2021); due to the outbreak of the war in Ukraine and the consequent difficulty in procuring the main Ukrainian clays that Cerdomus used in its paste mixture grinding, it was necessary to implement the forced replacement of these clays and mixture reformulation. As a result, the percentage of waste recovery also drastically decreased since the beginning of 2022, because it would have undermined the stability and quality of our finished product, thus recording an increase in waste delivered for 2022-2023. For the 2020-2023 four-year period the indicator of the internal/external reuse factor of waste/residues was between approximately 99.0% and 99.4%.

Waste is managed in the manner summarized in the following table:

Table 10.2 - Waste identification and related management –

EWC Code	Waste Type	Management
150101	Paper and cardboard	Storage in caissons and transfer to authorized company.
150102	Plastic	Pressing and storage in dedicated area and transfer to authorized company.
150103	Wood (mainly broken pallets which are no longer reusable)	Storage in removable containers and transfer to authorised company.
150106	Mixed packaging	Storage in removable containers and transfer to authorised company
170405	Iron and steel	Storage in caissons in dedicated area and transfer to authorized company.
101201	Residues of preparation mixture (raw waste)	Production waste stored indoors, in a dedicated area, delivered to a company authorised for recovery.
101203	Cutting powder	Production waste stored in big-bags within a dedicated area, delivered to a company authorised for recovery.
101208	Ceramic waste, tiles (fired waste)	Production waste stored in a dedicated area, delivered to a company authorised for recovery.
080202	Aqueous sludges containing ceramic materials - sludges from cutting	Production waste stored indoors in a special removable container in a dedicated area, delivered to a company authorised for recovery.

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170904	Construction and demolition waste	Rubble produced occasionally, stored in a dedicated area, granted to a company authorised for recovery.
170107	Mixtures of concrete and bricks	Produced occasionally, stored in dedicated area and handed over to authorised company for recovery.
161106	Refractories	Produced occasionally during maintenance periods, stored in removable containers supplied as required by authorised companies.
170202	Glass	Temporarily stored in special containers and disposed of by an authorised company.
170411	Copper cables	Storage in caissons in dedicated area and transfer to authorised company
160214	Electronic equipment no longer in use	Temporarily stored in special containers and disposed of by an authorised company.
150111*	Spent spray cans	Temporarily stored in special containers and disposed of by an authorised company.
160601*	Lead batteries	Temporarily stored in special containers and disposed of by an authorised company.
130205*	Spent oil	Storage in containers in dedicated area and transfer to authorised company. Maximum quantity 500 l.
101209*	Spent lime	Produced by the kiln fume purifier, collected in Big Bags of 300 kg and given periodically to authorised company for disposal.
150202*	Filter sleeves and filter material mixed	Temporarily stored in Big Bags and disposed of by an authorised company.
170503*	Soil and stones containing dangerous substances	Produced occasionally, stored in special containers and disposed of by authorised companies.
120109*	Oily emulsions	Storage in containers in dedicated area and transfer to authorised company.
170603*	Other insulation materials	Produced by the maintenance of firing kilns, collected in Big Bags and delivered to an authorised company for disposal.
200121*	Neon fluorescent tubes	Stored indoors in a special sector and delivered to an authorised company.
160211*	Discarded equipment containing chlorofluorocarbons	Produced occasionally during maintenance periods, temporarily stored in special containers and disposed of by an authorised company.
150110*	Packaging containing dangerous substances	Packaging waste placed on pallets, covered with shrink nylon, delivered to authorised disposal company
080312*	Waste ink containing dangerous substances	Temporarily stored in special containers and disposed of by an authorised company
160121*	Diverse hazardous components (oil-stained pipes)	Temporarily stored in special containers and disposed of by an authorised company
160107*	Oil filters	Temporarily stored in special containers and disposed of by an authorised company.
160602*	Nickel-lead batteries	Stored in special indoor collection containers and transferred to authorised company for recovery.
160213*	Discarded electronic equipment (monitors)	Temporarily stored in special containers and disposed of by an authorised company
061302*	Spent activated carbon filters	Temporarily stored in special containers and disposed of by an authorised company
120112*	Spent waxes and fats	Temporarily stored in special containers and disposed of by an authorised company
160708*	Waste containing oil	Temporarily stored in special containers and disposed of by an authorised company

11. SOIL AND SUBSOIL

The land occupied by the site was, before 1969, designated as an agricultural zone. As regards the geographical location and geological classification of the two sites, please refer to Chapter 1 of the present Document. Since the foundation of the company there have never been any forms of pollution of any kind and currently, the uncovered area is waterproofed by means of asphaltting and concrete.

Areas used for storing raw materials are all protected by canopies and are not, therefore, affected by the weather. The canopies are equipped with guttering that provides for the normal outflow of rain water to the sewers.

The goods loading/unloading areas are all paved, while the areas dedicated to the storage of raw materials are cemented (containment box).

The operations of unloading the raw materials for the formation of the paste mixture always take place in covered areas.

The technical report assessing the real possibility of soil and groundwater contamination is posted annually on the AIA-IPCC portal pursuant to Ministerial Decree no. 272 dated 13/11/2014; based on the considerations and measures adopted for the prevention and/or reduction of soil and groundwater pollution, it is believed that it is not necessary to proceed with a report.

12. NOISE

In the period of July/August 2022, phonometric surveys were carried out in order to complete three-year acoustic monitoring in accordance with the applicable AIA.

The CERDOMUS srl plant in Via Emilia Ponente 1000 covers an area of about 105,000 square meters (about 50,000 square meters of warehouse with its production area, offices and showroom) and borders:

- to the SOUTH -SOUTH-WEST with Via Emilia Ponente, crossed by heavy traffic. Past the street there are industrial activities and the R1 Receptor.
- to the WEST -NORTH-WEST with Strada Borello, past which there is an agricultural area and the R2 and R3 Receptors.
- to the EAST with an agricultural area and the R4 Receptor.
- to the NORTH-NORTH-EAST with other industrial warehouses.
- to the EAST-SOUTH -EAST with other industrial activities belonging to the same class.

The Shipping Warehouse in Via Calamello 1035 affects only receptors R5 and R6 to the NORTH-NORTH-EAST.

Summary table for receptors:

Codifica ricettore	Descrizione ricettore	Altezza in piani
R1	Edificio residenziale	2
R2	Edificio residenziale	1
R3	Edificio residenziale	2
R4	Edificio residenziale	2
R5	Edificio residenziale	2
R6	Edificio residenziale	2

The finished product is temporarily stored to the NORTH -EAST area of the main plant and subsequently transported by truck -shuttle to the storage area located to the NORTH of the main plant (with entrance in Via Calamello). The finished products are then loaded on the customers' trucks via forklift trucks.

The processing of floor tiles and coverings is carried out in some "main departments" termed:

- MONO DEPARTMENT 2

- GRANITAL DEPARTMENT
- ATOMIZER DEPARTMENT 1
- ATOMIZER DEPARTMENT 2
- POLISHING/GRINDING/CUTTING DEPARTMENT

Most emissions remain active 24 hours.

The production and ancillary facilities of the production hall are located inside the warehouses, with external noise input (e.g.: motors, fans, etc.).

In the storage area there are forklift trucks that follow an obligatory path.

Customers' heavy vehicles (about 10-20 per day) only reach the loading and unloading area adjacent to the entrance.

The Municipality of Castel Bolognese, with City Council Resolution no. 33 of 25/06/2007 and subsequent amendments, approved the Municipal Acoustic Classification Plan in accordance with Regional Law no. 15, art. 3 of 9th May 2001. The different classes are shown in Table 12.1., namely:

Class I - Specially protected areas. This class includes areas in which quiet is a fundamental element for their use: hospitals, schools, rest and recreational areas, rural residential areas, areas of high urban interest, public parks, etc.

Class II - Areas intended for mainly residential use. This class includes urban areas mainly affected by local vehicular traffic, with a low population density, with a limited presence of commercial activities and the absence of industrial and craft activities.

Class III – mixed areas. This class includes urban areas affected by local vehicular traffic or passing traffic, with average population density and the presence of commercial activities, offices, a limited presence of craft activities and the absence of industrial activities; rural areas affected by activities that use operating machinery.

Class IV – Areas of intense human activity. This class includes urban areas affected by heavy vehicular traffic, with high population density, with a high presence of commercial activities, offices, and craft activities; areas near major roads and railway lines; ports; areas with limited presence of small industries.

Class V – mainly industrial areas. This class includes areas affected by industrial settlements and with few houses.

Class VI – exclusively industrial areas. This class includes areas exclusively affected by industrial activities and without residential areas.

Table 12.1: Absolute noise emissions limit values – Leq in db (A) (article 3) Italian Prime Ministerial Decree dated 14/11/1997

Land use destination classes	Reference Times	
	Daytime (06.00 am-10.00 pm)	Nighttime (10.00 pm-06.00 am)
I specially protected areas	50	40
II mainly industrial areas	55	45
III mixed areas	60	50
IV intense human activity areas	65	55
V mainly industrial areas	70	60
VI exclusively industrial areas	70	70

As shown, the site is located within a Class V industrial area, with a daytime limit of 70.0 dBA and a nighttime limit of 60.0 dBA. There are roadside buffer areas for the Via Emilia and the railway nearby.

12.1 Receptors

The sensitive reception points examined are:

- R1** - House located to the SOUTH of the site analyzed;
- R2** – House located to the WEST of the site analyzed;
- R3** – House located to the NORTH-WEST of the site analyzed;
- R4** – House located to the NORTH-EAST of the site analyzed;
- R5** – House located to the NORTH of the warehouse analyzed;
- R6** – House located to the NORTH-EAST of the warehouse analyzed;



In summary, the classes of the individual receptors are:

Codifica ricettore	Classe acustica di appartenenza
R1	IV
R2	III*
R3	III*
R4	V
R5	IV
R6	IV
*NOTA: il primo fronte esposto della facciata dell'edificio è in classe IV.	

12.2 Survey methodology and location of measuring stations

Assisted spot surveys were carried out with sources turned on and sources turned off, in the daytime period and the nighttime period, at the previously identified sensitive receptors external to the site, namely the buildings with the following codes: R1, R2, R3, R4, R5 and R6.

At receptors R5 and R6, only the daytime limits were checked, considering the hours of operation of the warehouse (maximum hours 07.00-18.00).

Additionally, in line with the previous monitoring, surveys were carried out using the same methods on the following locations identified on the border of the property; measuring stations with codes from P1 to P10, as shown in the following figure:



Summarized below is the main acoustic data detected in the **daytime and nighttime reference periods, with sources turned on**:

Ricettore	Livello diurno dBA	Livello notturno dBA	L90 diurno dBA	L90 notturno dBA	Limiti assoluti di immissione		Limiti DPR 142/04		Verifica limiti assoluti di immissione		
					Limite diurno dBA	Limite notturno dBA	Limite diurno dBA	Limite notturno dBA	Superamento limite diurno dBA	Superamento limite notturno dBA	Note
P1	57.4	53.1	53.9	43.8	70	60	70	60	-	-	
P2	67.2	60.9	53.0	48.8	70	60	70	60	-	0.9	*
P3	62.5	59.4	54.5	45.0	70	60	70	60	-	-	
P4	59.1	52.8	55.3	49.1	70	60	70	60	-	-	
P5	60.7	51.6	55.4	44.8	70	60	70	60	-	-	
P6	57.9	51.7	48.6	44.9	70	60	70	60	-	-	
P7	62.6	57.5	62.0	56.9	70	60	70	60	-	-	
P8	55.2	51.5	50.6	50.5	70	60	70	60	-	-	
P9	58.0	53.6	56.7	52.3	70	60	70	60	-	-	
P10	66.7	53.9	65.9	53.2	70	60	70	60	-	-	
R1	64.5	62.0	55.1	51.8	65	55	70	60	-	7	**
R2	58.6	54.4	54.3	49.4	60	50	70	60	-	4.4	**
R3	61.4	57.1	54.8	48.8	60	50	70	60	1.4	7.1	**
R4	49.2	42.3	39.4	40.5	70	60	70	60	-	-	
R5	48.9		35.2		65	55	65	55	-	-	
R6	51.1		43.3		65	55	65	55	-	-	

*NOTA: Il superamento del limite è dovuto al traffico veicolare.

**NOTA: Il superamento del limite è dovuto al traffico veicolare. Togliendo tale contributo, ovvero verificando lo statistico L90, si verifica che il contributo delle sorgenti Cerdomus rispettano i limiti di zona.

Summarized below is the main acoustic data detected in the **daytime and nighttime reference periods, with sources turned off**:

Ricettore	Livello diurno dBA	Livello notturno dBA	L90 diurno dBA	L90 notturno dBA	Limiti assoluti di immissione		Limiti DPR 142/04		Verifica limiti assoluti di immissione		
					Limite diurno dBA	Limite notturno dBA	Limite diurno dBA	Limite notturno dBA	Superamento limite diurno dBA	Superamento limite notturno dBA	Note
R1	61.2	59.1	48.3	47.3	65	55	70	60	-	4.1	*
R2	59.5	55.2	46.3	44.0	60	50	70	60	-	5.2	*
R3	63.2	57.6	48.4	44.9	60	50	70	60	3.2	7.6	*
R4	42.3	38.5	38.5	34.0	70	60	70	60	-	-	
R5	41.8		31.0		65	55	65	55	-	-	
R6	38.3		34.3		65	55	65	55	-	-	

*NOTA: Il superamento del limite di zona è dovuto al traffico veicolare. Confrontando tali livelli con i limiti da DPR 142/04 si può verificare il rispetto dei limiti di legge.

Differential criterion

For the verification of the differential limit, the following is shown. Article 4 of D.P.C.M. 14/11/97 "Differential emission limit values", specifies that the differential emission limit values, defined in art. 2, paragraph 3, letter b) of law no. 447 of the 26th October 1995, are: 5 dB for the daytime period and 3 dB for the nighttime period, within residential areas.

The provisions referred to above do not apply in the following cases, as any noise effect is negligible:

- if the noise measured with windows open is lower than 50 dB(A) during the daytime period and 40 dB(A) during the nighttime period;
- b) if the environmental noise level measured with windows closed is lower than 35 dB(A) during the daytime period and 25 dB(A) during the nighttime period.

Considering that, as is often the case, it is not possible to verify compliance with the differential criterion by performing measurements inside the house in question, and considering that the situation with windows closed (letter b) of paragraph 2) is less restrictive than the former (as the average window blocks over 15 dBA), it is fundamental to be able to estimate, once the environmental noise level is known in front of the building, the corresponding level inside with open windows, in other words, the sound reduction. For this sound reduction, based on various publications, an average value has been verified at around 4-5 dBA; in the case under analysis, a conservative value of 3 dBA will be considered. It should be noted that the estimates are in favour of the safety of the receptors, as the legal limits were checked close to the edge of the receptor, and not 1m from the facade of the same.

Verification of the differential limit will later be evaluated for the residential environments of the residential receptors, taking the value measured with sources turned off as the residual noise level.

Since receptors R1, R2 and R3 are located within the roadside buffer area, and since DPCM 14/11/97 indicates that road traffic noise is not included in the differential limit test, the emission levels attributable to Cerdomus sources and the corresponding residual noise levels cleared of road traffic noise were determined using L90 statistics subtracted from the measurements.

The results shown below with regard to each receptor make it possible to verify compliance with the differential criterion in the daytime and nighttime periods.

Ricettore	Livello misurato a sorgenti accese		Livello di rumore Residuo		Insertion loss dBA	Differenziale	
	Livello diurno dBA	Livello notturno dBA	Livello diurno dBA	Livello notturno dBA		Diurno dBA	Notturno dBA
R1	55.1*	51.8*	48.3*	47.3*	3.0	3.8	1.5
R2	54.3*	49.4*	46.3*	44.0*	3.0	5.0	2.4
R3	54.8*	48.8*	48.4*	44.9*	3.0	3.4	0.9
R4	49.2	42.3	42.3	38.5	3.0	3.9	0.8
R5	48.9		41.8		3.0	4.1	
R6	51.1		38.3		3.0	**	

*Nota: L90 dedotto dalla misura.

**Nota: livello determinato all'interno dell'ambiente abitativo inferiore a 50 dBA. Differenziale rispettato per non applicabilità.

12.3 Evaluation of results - conclusions

This monitoring activity was carried out with the purpose of verifying the acoustic compatibility of the sound sources of the site with the applicable legal limits, in accordance with the provision indicated in the applicable AIA, which requires a survey of emission levels at the receptors every three years.

The verification of the legal limits was carried out both at the border of the property and close to the regularly monitored receptors.

The results of the survey made it possible to confirm compliance with the legal limits set by the Municipal Acoustic Classification, during both the daytime period and the nighttime period.

12.4 External vehicular traffic movements

The flow of vehicles arriving and departing from both the production plant and the shipping warehouse has never given rise to complaints from the population or local authorities.

For a more detailed analysis of the traffic data, see the Emilia-Romagna Regional Road Traffic Monitoring System (MTS), created by the Emilia-Romagna Region, the Provinces and ANAS. This is formed by 283 stations, in operation 24 hours a day, installed primarily on state and provincial roads.

In particular, there are two stations in the vicinity of the site, both on the main road (State Road 9 Via Emilia), northbound and southbound.

An analysis of the data shows an approximate average daily traffic level of 15,000 vehicles/day for the northbound station (towards Imola), and around 20,000 vehicles/day for the southbound station (towards Faenza).

During normal operations at Cerdumus, considering that the heavy vehicle traffic generated is mainly attributable to the delivery of raw materials, the transport of waste and the shipping of finished products, a flow of around 20/25 trucks per day is estimated. Considering the volumes of traffic described above on Via Emilia, it is clear that the traffic generated by the site is insignificant. Furthermore, the traffic generated by the site is primarily directed outside the municipality, and therefore, as well as being negligible compared to the current traffic flow, it almost exclusively affects areas outside residential centres.

13. BIODIVERSITY

The Cerdumus site is located in the Industrial Area of Castel Bolognese, divided into two areas, used as a production building and finished product warehousing.

As already mentioned in point 1.3, the surface area of the company includes:

→ the production site of Via Emilia Ponente (area A of Fig.1.1), with a total area of 104,239 m² of which 55,720 m² of built-up area, from which a biodiversity index is shown:

$$i_b = \text{built area/tot.area} = 0.53$$

The total waterproofed surface is approximately 87,500 m², hence a waterproofing index:

$$i_i = \text{waterproofed area/total area} = 0.84$$

The remaining non-waterproofed area is dedicated to greenery and planting, from which the index:

$$i_{vp} = \text{green and planted area/total area} = 0.16$$

→ the warehouse in Via Calamello (area B of Fig.1.1), with a total area of 84,954 m², of which 4,241 m² of built-up area, from which a biodiversity index is shown:

$$i_b = \text{built area/tot.area} = 0.05$$

The total waterproofed surface is approximately 70,000 m², hence a waterproofing index:

$$i_i = \text{waterproofed area/total area} = 0.82$$

The remaining non-waterproofed area is dedicated to greenery and planting, from which the index:

$$i_{vp} = \text{green and planted area/total area} = 0.18$$

In the last three years, the biodiversity and waterproofing indices have not changed for either of the 2 sites.

The outer open areas have asphalt or concrete surfaces to ensure the waterproofing of the underlying soil and thus avoid any form of infiltration of any dispersed substances.

At the production site, part of the run-off water is channelled into collection tanks and then sent to the water purifier.

In the warehouse in Via Calamello, the run-off waters are conveyed to a rolling basin before being let out into a surface water body (Rio Fantino).

In the last three years, the planting index has not changed for either of the two sites.

Since 2014 the company, in collaboration with the trade association Confindustria Ceramica, has introduced best practice phytosanitary rules in the management of the shipping of the tiles to the USA to prevent the introduction of foreign organisms to the ecosystem in that country.

The added value resulting from the application of a monitoring and inspection system following these guidelines can be seen in the following assurances offered the customer:

- Control of the storage and preparation process of the pallet withdrawn from the warehouse and destined for the USA;
- Control of the process of loading in USA-bound shipping containers in order to prevent the presence of pests (eg: gastropods, insects, seeds, etc...);
- Control of service delivery by applying the principles of traceability;

- Verification of the system by persons appropriately trained by The Plant Health Service of the Emilia-Romagna Region.

The certification of the adoption of this best practice for shipping to the USA was carried out in June 2014 by Certiquality and includes the CERDOMUS and PORCELLANA DI ROCCA brands.

Currently, there are around 122 certified Italian companies/brands.

In order to protect biodiversity, the Emilia-Romagna Region has identified "protected areas", sites belonging to the "Nature Network 2000" and the "Regional Ecological Network", and has issued laws for the protection of minor fauna.

The protected areas include parks, nature reserves, ecological rebalancing areas, and protected natural and semi-natural landscapes, as well as the Nature Network 2000 sites.

The Nature Network 2000 sites closest to the facility are:

- IT4050004 SIC "BOSCO DELLA FRATTONA", around 8.5 km away to the North-West
- IT4070025 SIC "CALANCHI PLIOCENICI DELL'APPENNINO FAENTINO", around 7.5 km away to the South
- IT4070011 SIC-ZPS "VENA DEL GESSO ROMAGNOLA", around 8.5 km away to the South

For this environmental element, there are no noted impacts caused by Cerdomus operations, due to both the significant distance of the site from the closest area and the results of specialist evaluations carried out with regard to the atmosphere and noise.

14. EMERGENCY

With regard to emergency situations, in addition to prevention activities, a number of activities have been planned to ensure prompt and effective intervention.

The emergency plan clearly indicates what actions and practices should be undertaken to ensure personal safety and minimise environmental impact.

Therefore:

- There are first-aid intervention teams who have been properly trained and organized in such a way as to ensure continuous coverage;
- Checks are carried out on first aid and fire fighting equipment to make sure that they are effective, efficient and complete;
- Staff are properly informed of what to do in an emergency;
- To deal with faults in the purification plants, planned, preventive maintenance systems have been adopted by the company so as to always ensure proper operation of the dust and fume suction fans. The company also carries out checks, at specified dates, for any vibrations of moving parts and carries out maintenance routinely whenever there is a malfunction;
- All purification plants are equipped with pressure switches capable of detecting any faults or malfunctions. Controls have daily records;
- Any accidental spills are channelled to the sewage treatment plant;
- Fire drills are planned.
- Alerting and evacuation drills are regularly carried out.

15. SAFETY AND HYGIENE IN THE WORKPLACE

Cerdomus S.r.l. has drawn up the risk evaluation document on the basis of Italian Legislative Decree no. 81/2008 in its plant, identifying potential hazard sources and planning improvement measures.

In these analyses account was taken of:

- Technological changes to the plants and / or production methods to be used;
- Preparing risk reduction procedures;
- Verification of measures taken;
- Training and information for all staff.

To assess the performance of the site regarding occupational safety and hygiene, statistical parameters extrapolated from the register of accidents and occupational diseases that the company has (see Table 15.1) have been used.

Table 15.1 - Safety and hygiene: parameters and indicators for evaluation –

Year	No. of accidents	No. of hours worked	No. of persons employed	Injury days	Index of severity	Index of frequency	Duration average
2020	2	235,212	170	95	0.40	8.5	47.5
2021	3	272,925	179	57	0.21	11.0	19.0
2022	3	267,482	181	62	0.23	11.2	20.7
2023	9	283,481	191	90	0.32	31.7	10.0

The accident indices for 2023 appear to have worsened compared to previous years, especially the frequency index. This is due to an increase in sizes produced, resulting in a greater likelihood of injuries due to collisions, cuts or crushing. However, in 2023 there was a decrease in the average duration of injuries.

16. ELECTROMAGNETIC POLLUTION

At the production site of Via Emilia Ponente (area A) are present:

- One inbound medium voltage electric switch cabinet (15,000 V);
- Three transformer cabinets MV/LV;
- One LV/MV transformer station serving the cogeneration engine.

All these cabinets are located in generally non-operational areas, and so induced electromagnetic pollution is not considered to be significant.

17. OZONE DEPLETING SUBSTANCES

At both sites, there are air conditioning systems for the air conditioning of office, production and canteen/break areas.

All plant and equipment is regularly surveyed and undergoes regular maintenance and cleaning (at least twice a year).

There are 31 systems with a quantity of refrigerant greater than 3kg (of which 3 containing R22). They are checked at least once a year by a qualified professional for leaks, have a proper system booklet, and are entered on the F-GAS portal.

With regard to systems containing R22 there is no planned disposal plan and they will continue to be in operation for the remainder of their useful lives, at which point they will be substituted as required by other systems using newly designed types of refrigerant.

18. PLANNED OBJECTIVES AND TARGETS

Objectives	Milestone/s	Indicator	Responsibility	Resources	Completion/ Deadline	Progress
Reduction of energy costs for lighting the internal and external areas of the plant	Installation of LED lights to replace traditional ones starting from the areas of the warehouse where they are used 24 hours a day	45% kWh saved	Energy Manager	Technical Department Maintenance Manager HSE € 10,000 / year	31/12/2022	COMPLETE
	Installation of LED lights to replace traditional ones in the pressing and glazing departments				31/12/2023	COMPLETE
	Installation of LED lights to replace traditional lighting in the grinding/cutting and heat-shrinking department				31/12/2024	COMPLETE
	Installation of LED lights to replace traditional lighting in the sorting and lapping department				31/12/2025	
Reduction of emissions deriving from the firing of ceramic material and reduction of methane consumption	Shutdown of 2 firing kilns currently installed in the Cerdomus facility, and installation of a new firing kiln with the same production capacity as the two to be removed.	Nm³/h Scm/h	Managing Director	Production Director Technical Department Maintenance Manager SACMI	01/06/2023	COMPLETE State-of-the-art kiln installed with an equal/superior production capacity.
Increase in energy efficiency	Installation of a new cogeneration plant, 2.5MW in size, optimized according to the company's consumption and with thermal recovery for heating slip waters.	€ 100k/month saved	Energy Manager	Technical Department Maintenance Manager HSE € 3,5 Mln	30/06/2024	COMPLETE New cogeneration plant installed

Objectives	Milestone/s	Indicator	Responsibility	Resources	Completion/ Deadline	Progress
Skills and awareness of staff as pertains the environment	Raising awareness of operating staff on environmental matters. Internal training/information on the correct management of environmental emergencies, with particular emphasis on good practices to be implemented in the event of spillage of substances near surface water	2 man-hours	DQA	RQ Environmental Manager HSE	30/06/2022	COMPLETE
					30/06/2023	COMPLETE
					30/06/2024	IN PROGRESS
					30/06/2025	
Production optimization	Project to renovate the lines and increase the automation of production processes; resulting reduction in energy consumption	€	General Management	Production Director Technical Department Maintenance Manager SACMI	01/06/2023	COMPLETE
Reduction of emissions into the atmosphere	Replacement of diesel forklift trucks with electric ones in warehouse P5	€ 4,000 of diesel saved in 6 months	General Management	P5 Warehouse Manager Maintenance Manager HSE € 500,000	30/06/2024	COMPLETE
Reduction in energy consumption	Compressed air leak detection campaign	Estimated annual savings of € 23,000	Energy Manager	Technical Department Maintenance Manager HSE € 4,500	31/08/2024	IN PROGRESS

Objectives	Milestone/s	Indicator	Responsibility	Resources	Completion/ Deadline	Progress
Reduction in energy consumption	Installation of inverter on 3-bag filters	Estimated annual savings of € 24,000	Energy Manager	Technical Department Maintenance Manager HSE € 80,000	31/08/2024	IN PROGRESS
Reduction in energy consumption	Replacement of atomisation department motors with machinery in the highest energy efficiency class	Estimated annual savings of € 6,800	Energy Manager	Technical Department Maintenance Manager HSE € 9,400	31/12/2024	IN PROGRESS
Reduction in natural gas consumption	Installation of heat recovery system from the chimneys of the LC1 oven to the LC1 dryer	Estimated savings of 40 Scm/h	Energy Manager	Technical Department Maintenance Manager HSE € 240,000	31/08/2024	IN PROGRESS

19. GLOSSARY

Initial Environmental Analysis: written document containing the analysis of performance and of the impact with regards to the company's environmental issues.

Environmental aspect: business activities that interfere and interact with the environment.

Atomization: controlled drying of the nebulized slip using hot air.

Firing: thermal process with which the ceramic material acquires the mechanical and chemical inertia characteristics of the product.

Vein Colouring: mixture colouring process during the atomization process.

dB: decibel, unit of measurement of sound pressure level.

dB(A): sound pressure level expressed in dB whose individual spectrum components have been passed in frequency according to curve A. Weighting A gives greater weight to frequencies ranging from 1000 to 4000 Hz, while reducing that of high frequencies and those below 500 Hz. The levels weighted to and then expressed in dBA are comparable to the auditory response of individuals.

Environmental effects: any total or partial variation, positive or negative, consequent to site activity.

EMAS: EU system which companies carrying out industrial activities can voluntarily join to evaluate and improve the environmental efficiency of industrial activities and to present this to the public with relevant information. The aim of EMAS is to continuously improve the environmental efficiency of industrial activities.

Gaseous emissions: are divided into - channelled, which exit the plants' chimneys; diffuse, which refer to areas of a certain size containing evaporating or vented surfaces of limited capacity.

Drying: thermal process with which almost all of the water contained in a pressed body is eliminated.

Frits: pre-packed glass that is ground and applied to the tile surface. Cooling leads to the solidification of the molten layer thus forming a glass which gives the tile surface both a particular aesthetic aspect (colour brilliance, decoration, etc.) and its technical characteristics (hardness, chemical resistance, etc.).

Vitrification: a process during which the ceramic mass glazes as its crystal lattice changes and it shrinks, loses porosity and increases in mechanical strength.

Injury incidence rate: number of injuries / number of employees x 1000

Nm³: Normal cubic metre, volume measurement unit (reference conditions: temperature T = 0 ° C; pressure P 1013 hPa).

NOx: nitrogen oxides; gases produced in combustion processes due to oxidation of the nitrogen contained in both fuels and combustion air. They can lead, in the presence of other pollutants, to the formation of photochemical smog in the atmosphere, especially in densely urbanized areas.

SOx: sulphur oxides; gases produced in the combustion processes by oxidation of the sulphur contained in both fuels and combustion air. They can lead, in the presence of other pollutants, to the formation of photochemical smog in the atmosphere, especially in densely urbanized areas.

pH: measurement of the concentration of H⁺ ions present in a given solution; they give an indication of acidity or alkalinity of the solution being examined.

Pressing: operation with which the atomized substance takes on a precise geometric shape (that of the tile).

Glazing: a method that involves the application of enamels and silk-screen pastes on the ceramic support.

Glazed or enamel: waterproof vitreous coating.

Porcelain stoneware: ceramic tiles made by pressing, with an unglazed surface or with different surface treatments (glazing, decoration, polishing, etc.). The raw materials are mixtures of clays, feldspars and sands, colouring pigments, etc. Firing takes place at relatively high temperatures (over 1200 °C), and the resulting structure is very compact (water absorption must be less than 0.5%). The technical specification of porcelain stoneware is given in Appendix G of UNI EN 14411.

Digital screen printing: decoration technique using inkjet machines for decorating tiles

20. MAIN LEGISLATIVE REFERENCES

CERDOMUS established and maintains active a Quality and Environmental Management System which guarantees the identification and updating of the legislation and other mandatory requirements concerning the company activities, defining responsibilities and operating methods for the collection, verification and control of legal requirements applicable to the organization as well as the monitoring of the organization's documentary and action compliance with the legislation.

CERDOMUS declares that it complies with the environmental regulatory provisions applicable to its activities, keeping updated through the newsletter of the trade association CONFINDUSTRIA CERAMICA, continuous staff training, and making use of advice from specialized companies.

Sector	Reference law
External Noise	Italian Prime Ministerial Law. D.P.C.M. 01.03.1991 No. 447 dated 26.10.95 Regional Deliberation 673 of 2004 - Definition of the technical criteria for the preparation of the document DEL Emilia Romagna No. 2053 dated 09.10.2001
Single Environmental Document	Italian Law Decree 152 / 06 Regional Law No. 3 of 20 / April 2012 Significant Impact on the Environment Regional Law No. 20 dated 24.03.2000 – Land Use Regional Law No. 21 of 2004 - Prevention and integrated reduction of pollution
Water	Italian Law Decree 152/06 Article 124 et seq. water discharge Italian Law Decree 152/06 Section III Water Management
Waste	Italian Law Decree 152/06 Waste Management Italian Law Decree 152/06 Article 189 et seq. Italian Law Decree 205 of 03/12/2010 Italian Law Decree 116/2020 of 26/09/2020
Atmosphere - Air Protection and Emission Reduction	Italian Law Decree 152/06 part five Italian Legislative Decree 59/2005 Legislative Decree 102 dated 30/07/2020: EMISSIONS, mod part IV of Legislative Decree 152/06
Authorisations	Italian Law Decree 152/06 art. 269 Regional Law 21/2004
Asbestos cement roofing	Italian Ministerial Decree 06/09/94
Waste water discharge	Italian Law Decree 152/06 Regional Law no. 5 art. 5 of 01/06/2006 Italian Law Decree 267 Article 107 of 18/08/2002
Environmental Damage	Italian Law Decree 152/06 part six
Greenhouse gas generating plants	Italian Law Decree No. 216 Reg. 21/06/2012 No. 601/2012 EU Act. Directives 2003/87/CE and 2004/101/CE
CONAI	Italian Law Decree 152/06 art. 218 and art. 221, ann. E point 2, Italian Ministerial Decree 22nd April 2014
ETS	Directive 2003/87/EC and subsequent amendments EU Reg. No. 600/2012 EU Reg. No. 601/2012 Italian Legislative Decree 30/2013 Document EA6/03 January 2010
E-PRTR	Regulation (EC) No. 166/2006 art. 4 Italian Presidential Decree 157/2011
MUD - Standard Form Of Environmental Declaration	Italian Prime Ministerial Law. D.P.C.M. 17.12.2021

21. CURRENT AUTHORISATIONS AND ENVIRONMENTAL CERTIFICATIONS

Sector Affected	Institution	Authorisation No	Note
AIA - integrated environmental authorisation	Arpae - Agenzia prevenzione, ambiente, energia dell' Emilia-Romagna (Emilia Romagna Prevention, Environment and Energy Agency) Ravenna SAC (Permits and Concessions Service)	No. 608 of 14/09/2007	
		No. 337 of 19/08/2009	
		No. 508 of 16/11/2009	Transfer
		No. DET-AMB (Environmental Decision)-2018-4551 of 06/09/2018	Non-substantial modification and transfer
		No. DET-AMB-2019-2450 of 23/05/2019	Non-substantial modification and transfer
		No. DET-AMB-2019-3996 of 02/09/2019	Non-substantial modification
		no. DET-AMB-2021-1401 of 23/03/2021	Non-substantial modification
		no. DET-AMB-2021-4910 of 04/10/2021	Non-substantial modification
		no. DET-AMB-2022-728 of 16/02/2022	Correction of DET-AMB-2021-4910 due to clerical error
no. DET-AMB-2023-2288 of 05/05/2023	Non-substantial modification		
CERTIFICATIONS Environmental	ISO 14001:2015 Certiquality	Cert. No. 9677 of 28/06/2021 (Current issue 01/08/2022 - expires on 27/06/2024)	Annual Renewal
	EMAS - Eco-Management and Audit Scheme Italian National Institute for Environmental Protection and Research (ISPRA)	Reg. no. IT-000705 (15/12/2006 1st issue) Renewal of Validation 01/08/2022 - expires on 28/06/2025	
CERTIFICATIONS Quality	ISO 9001:2015	Cert. No. 27915 of 14/11/2019 reg. no. IT-118707 (Current issue 13/07/2022 - expires on 12/07/2025)	Annual Renewal
Waste water discharge	Municipality of Castel Bolognese	Plant Prot. No. 14504 of 06/12/2004	Domestic waste water
	Province of Ravenna	Shipping Warehouse (P5) AUA No. 3173 of 20/10/2015	
Regional concessions for well water withdrawals	ARPAe Regional Environment and Energy Prevention Agency	No. DET-AMB-2023-1751 and No. DET-AMB-2023-1752 dated 06/04/2023 (Change of ownership) SISTEB CODE: BO05A0074 and BO03A0066	
Fire Prevention	Fire-Brigade - Provincial HQ Ravenna	<u>Production plant:</u> - CPI prot. No. 00001996 of 17/02/2015, file No. 11293, for activities 2.1.B, 3.7.B, 12.2.B, 34.2.C, 49.3.C, 56.2.C, 70.2.C, 74.3.C, 49.3.C, 1.1.C of Italian Presidential Decree DPR 151/2011. - Certificate of Periodic Renewal of Fire Safety Compliance (Article 5 of Italian Presidential Decree 01/08/2011 No. 151) of 16/12/2019 valid until 17/12/2024.	
		<u>Shipping Warehouse (P5):</u> - CPI prot. 13157/36597 of 21/10/2010 for activity 3.7.B, 4.3.A, 12.2.B, 34.1.B, 36.1.B, 44.1.B, 70.2.C, 74.1.A of Italian Presidential Decree DPR 151/2011 - Certificate of Periodic Renewal of Fire Safety Compliance (Article 5 of Italian Presidential Decree 01/08/2011 No. 151) of 18/10/2023 valid until October 2028.	
Plant manager for ETS	A.G.E.S. Min. Environment	No. 2256 of 2011	

Packaging	CONAI	Member Code No. 12917712	
Electric workshop license	Customs and monopolies agency	Prot.2014°12098 of 14/07/2014	
Italian Economic and Administrative Index REA code	CCIAA - Italian Chamber of Commerce, Industry, Crafts and Agriculture	RA- 217992	

22. REGISTRATION INFORMATION

This declaration has been drawn up by:

Marco Sangiorgi (Head of IMS Integrated Management System and Management Representative for the EMS) and *Marco Ossani* (*Environmental Services Technician*) and was officially delivered to all Cerdomus S.r.l. employees, up to the rank of department head.

This document is available and can be downloaded from the website: www.cerdomus.com

The next declaration will be drawn up within 1 year.

The management of Cerdomus S.r.l. undertakes to update all the information contained in the Environmental Declaration annually for the purposes of validation.

The verification of this Environmental Declaration was carried out by accredited environmental verifier *Certiquality* - registration number of accreditation IT-V-0001.

NACE 23.31, rev. 2 (ex 26.30)

Any copies, clarifications or details of this Environmental Declaration may be requested from:

- Marco Sangiorgi (Head of IMS and Management Representative for the EMS)

Tel. +39 0546.652111 / 0546.652141 – Fax +39 0546.50010

m.sangiorgi@cerdomus.com.

or:

- Ossani Marco (Environmental Services Technician)

Tel. +39 0546.652111 / 0546.652251 – Fax +39 0546.50010

m.ossani@cerdomus.com.

Castel Bolognese, 28/05/2024