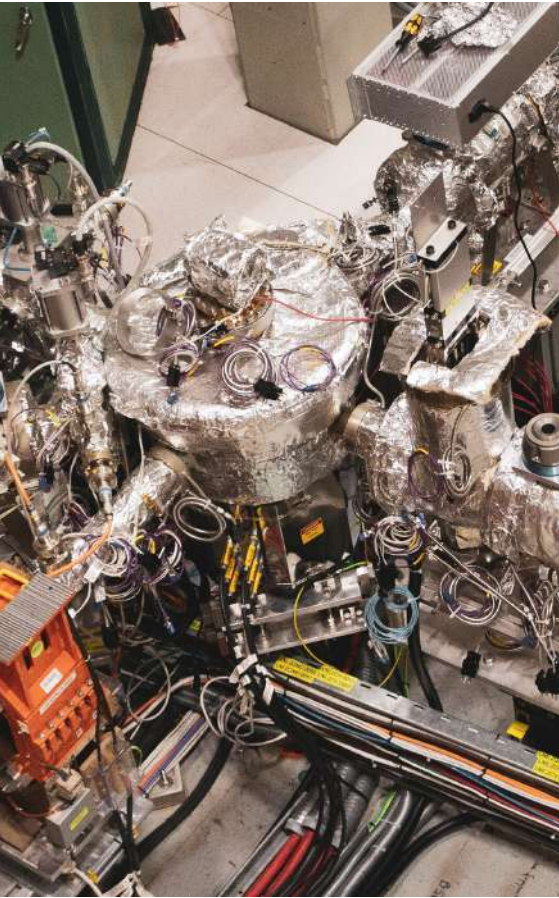


**JUNE
2019**

RESEARCH AND INNOVATION PROJECT INVENTORY



CERAME-UNIE INVENTORY OF EUROPEAN RESEARCH AND INNOVATION PROJECTS

This document brings together the information on research and innovation funded projects that are of high relevance to the ceramics industry. The document focusses on EU funded projects (Life+, SPIRE,...). Both ongoing projects and recently finalised projects are mentioned.



The following information was compiled with the help of CU members. It is to be considered as a living document and information on additional projects is always welcomed.

The main data provided in this document are:

- the acronym of the project and its full name;
- the project period;
- budget;
- funding programme;
- aim of the project;
- key ceramic partners and the countries involved;
- links to the project webpages.

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ONGOING PROJECTS

SPIRE FUNDED PROJECTS

DREAM: DESIGN FOR RESOURCE AND ENERGY EFFICIENCY IN CERAMIC KILNS

AIM

The DREAM project aims to design, develop and demonstrate a radically improved architecture for ceramic industrial furnaces, characterised by optimised energy consumption, reduced emissions, and lower operating costs compared to currently available technological solutions. This will be obtained by substantially enhancing specific furnace parts (control system, refractories, emissions abatement system) and by adding new modules and subsystems (CHP unit, heat pipes) to the current furnace architecture.

PARTNERS

10 partners from 4 countries, including:

- SACMI - Italy (project coordinator)
- RATH GMBH - Germany
- Mirage Granito Ceramico SPA - Italy
- Keraben Grupo SA - Spain

LINKS

- http://cordis.europa.eu/project/rcn/205615_en.html
- <https://www.spire2030.eu/dream>



START YEAR

2016

END YEAR

2019

BUDGET

5 076 105 €

FUNDING

SPIRE

DRYFICIENCY - WASTE HEAT RECOVERY IN INDUSTRIAL DRYING PROCESSES

AIM

The overall objective of the DRYficiency project is to lead energy-intensive sectors of the European manufacturing industry to high energy efficiency and a reduction of fossil carbon emissions by means of waste heat recovery to foster competitiveness, improve security of energy supply and guarantee sustainable production in Europe. The project addresses three sectors, namely brick, pet care/feed and food industry. The results are however of major relevance for a number of other energy-intensive industries such as e.g. pulp and paper industry. The key elements of the solution are two high temperature vapour compression heat pumps: a closed loop heat pump for air drying processes and an open loop heat pump for steam drying processes. The DRYficiency solution will be demonstrated under real production conditions. in operational industrial drying processes in three leading European manufacturing companies from the pet food, food and brick industries.

START YEAR

2016

END YEAR

2020

BUDGET

6 465 899 €

FUNDING

SPIRE



PARTNERS

112 partners from 5 countries, including:

- Wienerberger AG- Austria
- European Heat Pump Association - Belgium

LINKS

- http://cordis.europa.eu/project/rcn/205646_en.html
- <http://dry-f.eu/>

ETKINA – THERMAL ENERGY RECOVERY

AIM

ETEKINA is an EU funded research project aiming to recover 57-70 % of the waste heat stream in energy intensive industries. ETEKINA stands for “heat pipe technologies for industrial applications” and officially started October 2017.

Ten companies and institutes from across Europe have joined forces to improve the energy performance of energy intensive processes. Their solution is based on heat exchanger technology (HPHE) using heat pipes for thermal recovery. As part of the project, three HPHE prototypes will be built and tested for three different production plants in the aluminium, steel and ceramics sectors. The different industrial environments produce different exhaust streams with different waste heat quantity and quality (chemical composition, different particles coming out along with the gases, temperature and pressure of the flue gases, ...), and provide different processes where the recovered heat might be utilized. The challenge: the recovery solution should be adapted increasing the overall efficiency and being cost-effective.



ETEKINA
Thermal energy recovery

START YEAR

2017

END YEAR

2021

BUDGET

5 507 380 €

FUNDING

SPIRE

PARTNERS

Atlas Concorde, Brunel University London, Econotherm, ESCI, Fagor Ederlan, IK4-Ikerlan, Insertec, Jožef Stefan Institute, SIJ Metal Ravne, Unimore

LINKS

- <https://www.etekina.eu/>

SHAREBOX: SECURE MANAGEMENT PLATFORM FOR SHARED PROCESS RESOURCES

AIM

SHAREBOX is funded under SPIRE-1-2014- Integrated Process Control. Sharebox will develop a secure platform for the flexible management of shared process resources that will provide plant operations and production managers with the robust and reliable information that they need in real-time in order to effectively and confidently share resources (plant, energy, water, residues, and recycled materials) with other companies in an optimum symbiotic eco-system. Industrial Symbiosis (IS) is the use by one company or sector of by-products, including energy, water, logistics and materials, from another.

START YEAR

2015

END YEAR

2019

BUDGET

6 000 000 €

FUNDING

SPIRE



PARTNERS

- 15 partners from 6 countries, including:
- Ceramic Industry Research Association (ITC-AICE) - Spain
 - Keros Cerámica S.L. - Spain
 - Kerafrit S.A. (KERAFRIT) - Spain

LINKS

- <http://sharebox-project.eu/>
- <http://sharebox-project.eu/partners/>

IBD: INTENSIFIED BY DESIGN® FOR THE INTENSIFICATION OF PROCESSES INVOLVING SOLIDS HANDLING

AIM

IbD is funded under SPIRE – 8 – 2015. IbD® will create a holistic platform for facilitating process intensification in processes in which solids are an intrinsic part, the cornerstone of which will be an intensified-by-design® (IbD). Through five IbD®-enabled industrial process intensification case studies, the project will develop and upgrade methods for the handling of solids in continuous production units based, on the one hand, on the intensification of currently existing processes and, on the other hand, through completely new approaches to the processing of solids. The IbD approach is hinged on the use of robust data about a process to 'redesign', modify, adapt and alter that process in a continuous, intensified system, and will be the new paradigm in the intensification of processes.

LINKS

- <http://ibd-project.eu/>
- <http://ibd-project.eu/partners/>



START YEAR

2015

END YEAR

2018

BUDGET

11 000 000 €

FUNDING

SPIRE

PARTNERS

- 22 partners from 8 countries, including:
- Euroatomizado, S.A. (EUROATOM)- Spain
 - Ceramic Industry Research Association (ITC-AICE) - Spain
 - MBN Nanomaterialia S.p.A.(MBN) - Italy
 - Outotec Oyj (OUTOTEC) - Finland

SMARTREC: DEVELOPING A STANDARD MODULARISED SOLUTION FOR FLEXIBLE AND ADAPTIVE INTEGRATION OF HEAT RECOVERY AND THERMAL STORAGE CAPABLE OF RECOVERY AND MANAGEMENT OF WASTE HEAT

AIM

Waste heat is a problem common to high temperature processing industries as a significantly underused resource, often due to challenges in economic heat valorisation. Secondary aluminium recycling and ceramic processing were identified as key examples with economically recoverable waste heat. Several challenges are inherent; these processes are batch-based rather than continuous with corrosive particulate-laden flue gas over a wide temperature range. The Smartrec system meets these challenges by development of a standard, modular solution for integration of heat recovery with thermal storage that valorises medium to high grade waste heat, adaptable to different temperatures and industries. A knowledge-based tool will be developed containing all relevant Smartrec parameters and information to model the system fully and allow users to determine their requirements, potential benefits and integrate Smartrec into their own systems via an open access workshop hosted by the consortium.

START YEAR

2016

END YEAR

2019

BUDGET

4 567 886 €

FUNDING

SPIRE



Smartrec

PARTNERS

- 8 partners from 6 countries, including:
- Econotherm Limited - United Kingdom
 - Ceramic Industry Research Association (ITC-AICE) - Spain

LINKS

- http://cordis.europa.eu/project/rcn/205693_en.html
- <http://smartrec.eu/>

HARMONI

AIM

The HARMONI project has recently been approved by the European Commission and the starting date is expected to be October 2017. HARMONI is a CSA project with the aim of proposing solutions to regulatory bottlenecks and standardisation. A.SPIRE will have a role in identifying barriers and relevant SPIRE projects, and providing recommendations to “debottleneck”. A.SPIRE is Leader of the Communication WP. The German Refractory Institute ECREF will be involved as a partner.



START YEAR

TBC

END YEAR

18 months after duration

BUDGET

70 000 €

FUNDING

SPIRE

PARTNERS

7 partners from 3 countries, including:

- CIRCE - Spain
- Cefic- Belgium
- DIN- Germany
- Cembureau- France

LINKS

- <https://www.spire2030.eu/harmoni>
- <https://www.din.de/en/innovation-and-research/research-projects/services/harmoni-252538>

DESTINY- DEVELOPMENT OF AN EFFICIENT MICROWAVE SYSTEM FOR MATERIAL TRANSFORMATION IN ENERGY INTENSIVE PROCESSES FOR AN IMPROVED YIELD

AIM

The DESTINY project aims to realize a functional, green and energy saving, scalable and replicable solution, employing microwave energy for continuous material processing in energy intensive industries. The target is to develop and demonstrate a new concept of firing granular feedstock for materials transformation using full microwave heating as alternative and complement to the existing conventional production.

The DESTINY system is conceived as cellular kilns in mobile modular plant, with significant advantages in terms of resource and energy efficiency, flexibility, replicability and scalability with reduced environmental footprint.

The DESTINY concept will be proved in two demo sites located in Spain and Germany, covering high energy demanding sectors of strategic interest as Ceramic (Pigments), Cement (Calcined clay) and Steel (Sinter, Iron Pellets/DRI, ZnO), to validate the critical parameters of the developed technology in relevant environment (TRL 6). It will be implemented 2 feeding modules per demo site and 1 mobile microwave kiln module and product treatment.

Influence of the DESTINY solutions in terms of stability, process efficiency and characteristics of raw materials, intermediate/sub/final products will be investigated to improve performance of the industrial processes addressed and guarantee the required quality of products. Numerical simulation tools will be used to drive the design and support the testing activities.

The industrialization and sustainability of DESTINY high temperature microwave technology will be assessed through the evaluation of relevant KPIs, with Life Cycle Methodologies. With the final aim of ensuring a large exploitation and market penetration for DESTINY, technology-based solutions business model, economic viability and replicability analysis will be conducted. For guaranteeing industrial transferability appropriate exploitation and dissemination activities have been defined during and even after the end of the project.

START YEAR

2018

END YEAR

2022

BUDGET

8 442 000€

FUNDING

SPIRE

PARTNERS

14 partners from 8 countries, including:

- Inceinnmat SI - Spain
- National Technical University Of Athens - Ntua -Greece
- Universita Politecnica Delle Marche - Italy
- Universitat Politecnica De Valencia - Spain
- Al Farben Sa - Spain
- Chumillas Technology Sociedad Limitada - Spain

LINKS

- <https://www.destinyh2020andbeyond.eu/>

AMITIE - ADDITIVE MANUFACTURING INITIATIVE FOR TRANSNATIONAL INNOVATION IN EUROPE

AIM

Additive manufacturing (AM) technologies and overall numerical fabrication methods have been recognized by stakeholders as the next industrial revolution bringing customers' needs and suppliers' offers closer. It cannot be dissociated to the present trends in increased virtualization, cloud approaches and collaborative developments (i.e. sharing of resources). AM is likely to be one good option paving the way to Europe re-industrialization and increased competitiveness. AMITIE will reinforce European capacities in the AM field applied to ceramic-based products.

Through its extensive programme of transnational and intersectoral secondments, AMITIE will promote fast technology transfer and enable as well training of AM experts from upstream research down to more technical issues. This will provide Europe with specialists of generic skills having a great potential of knowledge-based careers considering present growing needs for AM industry development. To do that, AMITIE brings together leading academic and industrial European players in the fields of materials science/processes, materials characterizations, AM technologies and associated numerical simulations, applied to the fabrication of functional and/or structural ceramic-based materials for energy/transport, and ICTs applications, as well as biomaterials. Those players will develop a new concept of smart factory for the future based on 3D AM technologies (i.e. powder bed methods, robocasting, inkjet printing, stereolithography, etc.) and their possible hybridization together or with subtractive technologies (e.g. laser machining). It will allow for the production of parts whose dimensions, shapes, functionality and assembly strategies may be tailored to address today's key technological issues of the fabrication of high added value object following a fully-combinatorial route. This is expected to lead to a new paradigm for production of multiscale, multimaterial and multifunctional components and systems

START YEAR

2017

END YEAR

2021

BUDGET

877 500 €

FUNDING

SPIRE

PARTNERS

16 partners from 6 countries, including:

- Institut National Des Sciences Appliquees De Lyon - France
- Universite Polytechnique Hauts-De-France - France
- Friedrich-Alexander-Universitaet Erlangen Nuernberg - Germany
- Bundesanstalt Fuer Materialforschung Und - Pruefung-Germany
- Universita Degli Studi Di Padova - Italy
- Politecnico Di Torino - Italy
- Universitat Politecnica De Catalunya - Spain
- Centre De Recherches De
- L'industriebelge De La Ceramique Asbl - Belgium

LINKS

- <https://cordis.europa.eu/project/rcn/207452/factsheet/en>

High-value ceramics are widely utilised in high-end engineering disciplines due to their low density, Outstanding mechanical strength alongside with their excellent thermal, corrosion and wear resistance for aerospace, and medical applications. However, conventional manufacturing techniques are time-consuming and show several limitations, such as geometrical variation induced by the shrinkage during sintering and low material yield, alongside with high tool wear during milling and machining. As of today, these drawbacks impede the industrial utilisation of these ceramic materials for a growing range of engineering and medical disciplines. To tackle this problem, DOC-3D-PRINTING will train a new generation of Early-Stage Researchers (ESR) to develop the whole value chain of ceramics 3D printing from elaborating feedstock to testing in products for commercialisation.

AIM

DOC 3D Printing will cover the whole value chain of ceramics 3D printing, from laboratory research to product development. Accordingly, the research objectives are:

- to develop feedstock customised for 3D-printing (AM) at reduced cost
- to design and build next generation of 3D printers and strategies specifically dedicated to ceramics production (net-shape ceramics faster with desired properties & design at reduced cost)
- to correlate input to output produced ceramics and demonstrate it for applications
- to define and establish standardisation, regulatory issues, qualifications and risks analysis
- to increase knowledge on modelling & characterizations and develop specific tools for that

The close interactions between academic and non academic sectors within research activities is a key aspect of the project in order to transfer scientific knowledge to the market and close the gap of the death valley, and to strengthen the education of PhD fellows through the relevant skills and an enhanced competitiveness.

START YEAR	END YEAR
2018	TBC
BUDGET	FUNDING
TBC	SPIRE

PARTNERS

9 partners from 6 countries, including:

- Eurocoating Spa- Italy
- Marion Technologies S.A.- France
- Gazi Universiti- Turkey
- Cerhum- Belgium
- University of Birmingham- United Kingdom

LINKS

- <http://www.doc-3d-printing.eu/en/about-the-project/project-overview.html>

LIFE FUNDED PROJECTS

HEART- IMPROVED HEAT RECOVERY IN CLAY ROOF TILES AND BRICKS PRODUCTION

AIM

This project aims to demonstrate that it is possible to significantly reduce the natural gas consumption and the CO2 emissions of existing state-of-the-art clay roof tiles or bricks production unit. TERREAL proposes to improve the current state of the art by applying energy recovery systems from other industries to the clay manufacturing process, and by integrating them in order to operate in a stable and reliable way 24 hours / day and 7 days / week. TERREAL concluded from preliminary studies that the existing state of the art can be improved by transferring technologies from other industries, and by integrating them into the clay manufacturing process: static exchanger and direct contact exchanger.

PARTNERS

- TERREAL- France

LINKS

- <http://life-heart-terreal.com/en/project/objectives/>
- http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4708&docType=pdf



START YEAR

2013

END YEAR

2017

BUDGET

2 982 466 €

FUNDING

LIFE

LIFE NANOCERAMICO2 - CLIMATE CHANGE PREVENTION BY THE INCLUSION OF NANOPARTICLES IN CLAYS FOR THE REDUCTION OF CERAMIC INDUSTRY CO2 EMISSIONS

AIM

The project's main objective was to reduce natural gas consumption and carbon dioxide (CO₂) emissions from the firing of ceramic materials in a factory producing bricks and roof tiles. This goal would be achieved through an innovative method that uses calcium carbonate (CaCO₃) nanoparticles in raw materials, which enables the firing temperature to be reduced. The project would design and develop a prototype to produce calcium carbonate (CaCO₃) nanoparticles and introduce them into the ceramic mass in order to obtain a homogeneous mixture. The project would test the firing of the mixture at semi-industrial and industrial scale.

START YEAR

2014

END YEAR

2017

BUDGET

923 190 €

FUNDING

LIFE



PARTNERS

2 partners from Spain:

- Erabrick (Cerabrick Grupo)
- Cerámico, S.A)
- Asociación para la Investigación y Desarrollo Industrial de los Recursos Naturales (AITEMIN)

LINKS

- http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5076

FERTILIFE – AGRICULTURAL CARBONIC FERTILIZATION WITH CERAMIC INDUSTRY GEI EMISSIONS

AIM

LIFE14 CCM/ES/000311 is a project co-funded by European Union within LIFE Program Climate Change Mitigation. In the LIFE_FERTILIFE project, waste gases from the ceramic industry will be used in agriculture as an acidifier in irrigation water. The LIFE_FERTILIFE project aims to develop a prototype in which CO₂ emissions from a ceramics factory will be captured and used to carbonate water that will be used to irrigate crops. The project will: 1. Demonstrate the feasibility of “carbonic fertigation” – the injection of carbon into an irrigation system – for citrus crops, and analyse the impact of the continued use of CO₂ in the soil and plant irrigation network. 2. Design and implement techniques for proper CO₂ dissolution in a drip irrigation system, and monitor the implementation of the system and its deployment on different plots. 3. Assess the impact of carbonic fertigation on root respiration, and thus on total soil organic matter content. 4. Quantify the impact of carbonic fertigation on the use of chelates and other fertilisers. The use of chelates (chemical compounds) in agriculture is necessary to help plants absorb trace elements such as iron from soils with high pH, as in the Mediterranean basin.

PARTNERS

4 partners from Spain, including:

- Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos (ASCER)
- Ceramic Industry Research Association (ITC-AICE) - Spain



LINKS

- <http://www.fertilife-project.eu/project/members/>
- http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5257

START YEAR

2015

END YEAR

2018

BUDGET

1 047 073 €

FUNDING

LIFE

FOUNDRYTILE: VALORIZATION OF IRON FOUNDRY SANDS AND DUST IN THE CERAMIC TILE PRODUCTION PROCESS

AIM

The LIFE FOUNDRYTILE project aims to demonstrate the valorisation of iron foundry sands and dust wastes in the ceramic tile production process, thus contributing to the implementation of Waste Framework Directive (2008/98/EC) and the goals of the Roadmap for a Resource-Efficient Europe. The new applications will have three main benefits: the preservation of natural resources, the increase in foundry waste valorisation and environmental footprint reduction. The innovation character is provided by the utilization of green and chemically bonded foundry dust and sand in tile production replacing natural products, clay (for red clay ceramic products) and sands (for white clay ceramic products). The demonstration character is provided by the pilot and industrial scale tests, to validate the environmental, technical and economic feasibility of foundry by products valorization in ceramic tiles production. The project results will be used to revise Best Available Techniques Reference Documents (BREFs) for both foundry and ceramic sectors (BREF codes SF and CER).

START YEAR

2015

END YEAR

2018

BUDGET

1 205 363 €

FUNDING

LIFE



PARTNERS

5 partners from Spain, including:

- Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos (ASCER)
- Ceramic Industry Research Association (ITC-AICE) - Spain

LINKS

- <http://foundrytile.eu/project/members/>
- http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5281

SILIFE – PRODUCTION OF QUARTZ POWDERS WITH REDUCED CRYSTALLINE SILICA TOXICITY

AIM

Prolonged inhalation of crystalline silica particles can cause lung inflammation and the lung disease known as silicosis. It is used in many manufacturing industries such as the cement, ceramics, steel, glass, mineral wool, aggregates, mortar and concrete sectors. Although it is not possible to substitute crystalline silica in many of the sectors where it is used, it is possible to nullify its toxicity by treating it with certain substances. The main objective of the SILIFE project is to produce commercial quartz powders that have very little or zero RCS toxicity. This new coating technology would be replicable in any industry that uses separate dry quartz powders as raw materials. Specifically, the project aims to design a pilot plant for the treatment of commercial quartz powders that has the capacity to treat 500 000 kg of quartz per year and demonstrate that the treated powders exhibit much less toxicity than the untreated quartz.

START YEAR

2015

END YEAR

2019

BUDGET

1 666 059 €

FUNDING

LIFE



PARTNERS

10 partners from 3 countries, including:

- Esmalglass - Itaca - Spain
- Centro Ceramico (CC) - Italy

LINKS

- <http://www.silife-project.eu/>
- http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5280

CERSUDS - CERAMIC SUSTAINABLE URBAN DRAINAGE SYSTEM

AIM

The main objective of LIFE CERSUDS is to improve the resilience of cities to climate change and promote the use of green infrastructure in their urban planning as a means of managing surface water flooding. It aims to achieve this through the development and implementation of a demonstration low-carbon SUDS. The system will consist of an innovative permeable surface with a very low environmental impact, based on the use of tiles with low commercial value.

PARTNERS

6 partners from 3 countries:

- Trecadis de Sempre S.L - Spain
- CHM Obras e Infraestructuras S.A. - Spain
- Centro Tecnológico da
- Cerâmica e do Vidro - Portugal

LINKS

- http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5665#RM



START YEAR

2016

END YEAR

2019

BUDGET

1 817 972 €

FUNDING

LIFE

HEROTILE PROJECT

AIM

In order to help the EU construction sector (refurbishment and new constructions) to achieve its energy efficiency targets and related CO2 emissions and to facilitate the global market uptake of an eco-innovative EU product able to help reaching these objectives, LIFE HEROTILE Project will develop:

- two new types of roof tiles (Marseillaise and Portuguese tiles) with a shape characterized by a higher air permeability through the overlap of the tiles, and then a better energy performance by passive disposal of the solar radiation through under-tile ventilation;
- a practical and simplified free-license software for architects and technicians – SENSAPIRO Software ENergy SAVings PItched Roofs- that, as developed on the basis of experimental data, it will be able to predict the energy performance of the same building in changing only the roof configuration.



PARTNERS

6 partners from 3 countries, including:

- Italian National Association of Clay Bricks and Roofing Tiles Producers (ANDIL) – Italy
- Braas Monier Building Group – Germany
- Terreal – France

LINKS

- <http://www.lifeherotile.eu/objectives/>

START YEAR

2015

END YEAR

2019

BUDGET

2 476 158 €

FUNDING

LIFE

ECONOMICK

AIM

The ECONOMICK project is about helping the European ceramic sector to reduce its environmental impact and improve its competitiveness by developing an innovative intermittent kiln that consumes about 45% less energy compared to those that are currently available. The innovative shuttle kiln that is being developed will have applications in the firing of sanitary ware, tableware and refractories. As well as energy savings, ECONOMICK is expected to result in reduced CO₂ and NO_x emissions and reduced raw material consumption. ECONOMICK kilns are also expected to reduce operating costs and improve production flexibility.

PARTNERS

The three company partners are:

- SETEC group
- Life Cycle Engineering
- Kerasan

LINKS

- <http://www.economick.eu>

ECONOMICK

START YEAR

2016

END YEAR

2019

BUDGET

1 500 000 €

FUNDING

LIFE

REMEB (RECYCLED MEMBRANE BIOREACTOR)



AIM

The REMEB project brings together 11 partners from seven different countries. The main objective of the REMEB project is the implementation and validation of a low cost recycled ceramic membrane bioreactor (MBR) for water reuse in municipal and industrial wastewater treatment plants.

Currently available MBRs using inorganic membranes tend to have high running and maintenance costs. The REMEB project proposes to develop a new type of MBR which will significantly decrease the cost of MBR technology. REMEB will use by-products from agro-industrial wastes (e.g. olive stones, hazelnut shells) and ceramic waste (chamotte) to develop the MBRs.

The REMEB project has partners in three countries: Spain, Italy and Turkey. The first stage of the project is taking place in Spain using chamotte, olive stones and waste from marble shaping and polishing. The membrane will then be replicated in Turkey and Italy using recycled materials and wastes that are available locally.

Validation of the technology will take place at a wastewater treatment plant in Aledo in the Murcia region of Spain, with the aim of using the water for irrigation purposes in this water scarce area.

START YEAR

2015

END YEAR

2018

BUDGET

2 361 622 €

FUNDING

LIFE

PARTNERS

FACSA, ITC-UJI, IMECA Process, ATLANTIS Consulting, BIOWATER, the Valencia Region Council of Chambers of Commerce, IPROMA, Centro Ceramico, SAM in Turkey, Antonio Ariño, University in Colombia and the Wastewater Management Entity of Murcia region and ESAMUR.

LINKS

- <http://www.remeb-h2020.com>

CLEANTECHBLOCK2

AIM

The CLEANTECHBLOCK2 project is a project that is led by Gråsten Brickworks in Denmark to pursue an innovative building component that will create a systemic change with the construction market and recycling market in Europe. The project follows on from where the project CleanTechblock left off, and aims to finalise the technical development that started under CleanTechBlock. The intention is to then commercialise this product which is a patented multifunctional sandwich-block based on the combination of two clay brick shells and foamed recycled glass. It is hoped that this newbuilding product will meet the market preferences for more environmentally friendly products, as well as make a positive contribution to the energy efficiency of buildings, while reducing the demand for raw materials.

The CleanTechBlock has demonstrated value for money and reduced labour time in the construction phase, on top of reduced transportation costs. As well as this, the sandwich-blocks offer an overall increase in the living areas of 3-5%, while also demonstrating compelling insulation properties.

CLEANTECHBLOCK2 is expected to result in an expected sales turnover of €67M and profits of €15M, 6 years after commercialization. The product is expected to be sold for both residential and non-residential construction and the primary target markets will be Denmark, Sweden and Germany. The CLEANTECHBLOCK2 project will help the EU to achieve its energy and environmental policy objectives.

START YEAR

2017

END YEAR

2019

BUDGET

1 100 750 €

FUNDING

LIFE



PARTNERS

Graaten Teglvaerk

LINKS

- http://cordis.europa.eu/project/rcn/210634_en.html

ATHOR -ADVANCED THERMOMECHANICAL MULTISCALE MODELLING OF REFRACTORY LININGS

AIM

The ATHOR (Advanced Thermomechanical multiscale modelling of Refractory linings) network is firstly dedicated to train researchers in multi engineering required fields for a better understanding of thermomechanical behaviour of refractory linings used in I&S applications. The project will cover all the main features of thermomechanical analysis of refractory linings including material characterization, impact of corrosion on thermomechanical properties, thermal shock resistance, modelling of non-linear thermomechanical behaviours, instrumentation of industrial devices and measurement in operation conditions. The 15 ESRs recruited will take advantage of the most sophisticated numerical tools to model, design and predict the life of different lining configurations in critical operational conditions. Being trained in scientific, technical and soft skills, these ESRs are the next generation of highly employable scientists and engineers in the refractory sector and related areas.

New testing methods and models will be developed to address the Scientific/Technological (S/T) challenges for these applications and help to design better performing refractory materials and linings. The research training is implemented through strong relationships between academia and industrial partners across the EU. The ATHOR network is structured to take full advantage of intensive cooperation between academia (AGH, MUL, RWTH, UMINHO, UNILIM, UORL), raw material suppliers (ALTEO, IMERYS), refractory producers (RHI MAGNESITA, PYROTEK, ST-GOBAIN) and consumers (TATASTEEL) with a direct link to the FIRE federation. This cross-disciplinary approach throughout the ATHOR value chain will dramatically increase the transfer of scientific knowledge to the refractory-consuming industries in the EU, ensuring their progress on social, environmental and economic aspects. The main scientific objective of the ATHOR network is to adapt and develop the most advanced modelling strategies and experimental technologies to the field of refractory to be able to perform reliable computations and measurement in the temperature range of the applications of these materials. ATHOR targets the development of high-end engineering technologies in the fields of material's science and numerical simulations to give a substantial contribution through the design of more robust and reliable refractory linings. Ultimately, it represents a reduction of the refractory costs, an increase of the equipment's availability and an enhanced process control. In addition to the great energy savings that meets the industrial partner's interests, the ATHOR project contributes also to tackling environmental issues.

START YEAR

2017

END YEAR

2019

BUDGET

1 100 750 €

FUNDING

LIFE

PARTNERS

14 partners in 8 countries. including:

- University of Limoges (France)
- University of Minho (Portugal)
- RHI-Magnesita (Austria)
- Pyrotek Scandinavia AB - Ed (Sweden)

LINKS

- <http://www.etn-athor.eu/>



AIM

Refractories are used in high temperature processes, involving raw materials that are largely considered as “critical”. Surprisingly, only 7% of the raw material volume arises from recycled sources. While it could be expected that the “4R” approach (reduce-reuse-remanufacture-recycle) is well established in steel companies, valorisation of refractory materials is most often sporadic and the sector’s Best Available Techniques reference document (BREF) only provides general recommendations in this respect.

The overall purpose of the LIFE 5ReFRACT project is to extend the “4R” approach to a “5R” paradigm (reduce-reuse- remanufacture-recycle-re-educate) and apply it to the steel sector and refractories market, thus achieving an integral valorisation of refractory materials (the aim is to increase the recovery of refractories up to 80% of the recoverable fraction). The LIFE 5REFRACT project will constitute the first industrial and systematic demonstration experience dealing with refractory waste in the steel sector.

Its specific objectives are the following:

- Development of new high added-value refractory materials that will be up to 70% reprocessed material from spent refractories.
- Reduction of soil occupation and pollution by avoiding the landfilling of up to 3,600 tonnes of refractory waste.
- Reduction of CO₂ emissions (3,340 tonnes CO₂/year) and energy consumption (approx. 6,100,000 kWh/year) by recycling refractories, as it is not necessary to produce magnesite and alumina from the source mineral.
- Establishment of guidelines for the European steel sector to adopt these strategies, disseminating the good practices defined in the sector.
- Contribution to the state of the art in refractory waste management so as to enrich and complete the BREF document on steel with specific methodologies and applications.
- Analysis of synergies between the steel industry and other energy-intensive industries in order to define new circular economy models based on the sharing and use of resources.

START YEAR

2018

END YEAR

2020

BUDGET

1 675 395 €

FUNDING

LIFE

PARTNERS

- REFRALIA, S.L., Spain Universidad de Málaga, Spain
- SIDENOR INVESTIGACIÓN Y DESARROLLO S. A., Spain
- Magnesitas Navarras, S.A., Spain
- 2.-0 LCA consultants, Denmark

LINKS

- <https://www.life5refract.eu/en/>
- https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=6759

OTHER FUNDED PROJECTS

AIM

A Solid Oxide Fuel Cell (SOFC) is a ceramic-based multilayer device that involves expensive and time-consuming multi-step manufacturing processes including tape casting, screen printing, firing, shaping and several high-temperature thermal treatments. The main goal of the Cell3Ditor project is the development of a 3D printing technology for the industrial production of SOFC stacks by covering research and innovation in all the stages of the industrial value chain. All-ceramic joint-free SOFC stacks with embedded fluidics and current collection will be fabricated in a two-step process (single-step printing and sintering) to reduce in energy, materials and assembly costs while simplifying the design for manufacturing and time to market.

Compared to traditional ceramic processing, the Cell3Ditor manufacturing process presents a significantly shorter time to market (from years to months) and a cost reduction estimated in 63% with an initial investment below one third of an equivalent conventional manufacturing plant (production of 1000 units per year).

LINKS

- <http://www.cell3ditor.eu/about/>

CELL3DITOR

Cell3Ditor

START YEAR

2016

END YEAR

2019

BUDGET

2 191 233 €

FUNDING

Fuel Cells and Hydrogen
Joint Undertaking

PARTNERS

8 partners from 6 countries, including:

- 3DCeram - France
- SAAN Energi AB - Sweden
- Francisco Alberro, S.A. - Spain

CRAM - TOWARDS A RAW MATERIALS STRATEGY FOR THE EUROPEAN CERAMIC INDUSTRY

AIM

ICRAM is aimed at providing data and information toward an industrial strategy for ceramic raw materials in Europe. A dual approach, by fostering an interplay between the knowledge on mineral/waste potential and that on ceramic technology, is needed to go beyond running EU projects in this field. It can help drawing some of the innovation paths in the next decade. Expected results: 1) identification of critical situations in raw materials supply (CRMs list from the ceramic industry viewpoint); 2) study of the ceramic raw materials flow in Europe; 3) technological classification of ceramic raw materials to support geological mapping and exploration; 4) industry-oriented definition of feasible alternatives (primary and secondary raw materials) to current key resources; 5) roadmap to new ceramic products and processes in function of the medium- to long-term availability of raw materials.



PARTNERS

ISTEC-CNR Faenza (coordinator), Centro Ceramico Bologna, University of Modena & Reggio Emilia (Italy); University of Patras (Greece); Laboratório Nacional de Energia e Geologia, University of Aveiro (Portugal); AICE-ITC, Fundacion Innovarcilla, Instituto de Ciencias de la Construcción Eduardo Torroja, Instituto Geologico Minero de España, Malpesa, University of Granada, University of Jaén, University of Sevilla (Spain); SAM, Ceramic Research Center Eskişehir (Turkey)

LINKS

- <https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/towards-raw-materials-strategy-european-ceramic-industry>

START YEAR

2016

END YEAR

2019

BUDGET

TBC

FUNDING

Strategic implementation plan

EUCERMAT: EUROPEAN CERAMIC MATERIALS

AIM

EUCERMAT is co-funded by the Erasmus + programme. The project aims at changing the image of ceramics in Europe. The development and implementation of innovative practices to promote ceramic sciences to the community, civil society, high school students and teachers, parents, educators in general, ceramic industry staff, is thus a huge issue. The activities of the project aim to create a new methodology based on a relevant functioning of the knowledge triangle in the domain of ceramic material. Thus, the joint work of the partnership is seeking to create a common space where the interaction between research, education and innovation is optimised. To achieve these objectives the project is setting up various activities closely connected.

PARTNERS

13 partners from 8 countries, including:

- Refractory Solutions Inserter SL – Spain
- Porcelains of Costa Verde SA. – Portugal
- European Ceramic Society (ECerS) – Belgium

LINKS

- <http://www.unilim.fr/eucermat/>
- <http://ec.europa.eu/programmes/erasmus-plus/projects/eplus-project-details-page/?nodeRef=workspace://SpacesStore/47c52850-5ad9-4078-9f41-a9ebf7b87674>



START YEAR

2015

END YEAR

2018

BUDGET

359 897 €

FUNDING

Erasmus+ Programme

WINCER - WASTE SYNERGY IN THE PRODUCTION OF INNOVATIVE CERAMIC TILES

AIM

The WINCER project aims to develop innovative ceramic tiles made from over 70% recycled materials from urban and industrial wastes in substitution of natural raw materials. The project aims to recover soda lime glass cullet waste that is not currently being reused or recycled as glassware. This is expected to result in improved environmental performance by reducing the use of raw materials and reducing the maximum sintering temperature. These two changes are associated with reduced energy consumption and associated greenhouse gas emissions.

The tiles are expected to have similar or improved mechanical properties to traditional tiles.

PARTNERS

- Centro
- Ceramico
- Minerali Industriali, Marazzi

LINKS

- <http://www.wincer-project.eu>



START YEAR

2015

END YEAR

2017

BUDGET

1 489 312 €

FUNDING

Erasmus+ Programme

RESEARCH FUND FOR COAL AND STEEL: HYDROPIC ANALYSIS AND CONTROL OF HYDROGEN CONTENT DURING STEELMAKING

AIM

The objective of the research project is to enhance the control of the hydrogen content during the different steps of liquid steelmaking, to reliably achieve low target hydrogen contents in the final product under reduced energy and resource consumption. To this purpose, detailed investigations on hydrogen pick-up and removal throughout the key processes of liquid steelmaking, i.e. secondary metallurgy and continuous casting, will be performed. They will be accompanied by dedicated measurement campaigns of the hydrogen content dissolved in liquid steel and the transfer into the as cast material based on novel in-situ measurement technologies. The results of these investigations will be used to derive correlations of hydrogen content evolution with the process conditions during the different treatment steps with focus on ladle treatment as well as casting via the tundish. On this basis dynamic process models for the relevant mechanisms and metallurgical reactions of hydrogen pick-up and removal will be set up. The models will be used in combination with optimized in situ measurements to monitor and predict the evolution of the hydrogen content dissolved in liquid steel throughout the complete process chain. A combination of model-based advisory system, in-situ measurement strategies and dynamic control of process parameters will be developed to apply optimal operational practices for the quality-dependent demands, for a reliable achievement of the target hydrogen content in the final product under minimum energy and resource consumption. The complete system will be tested and validated under industrial conditions in plant trials and established for operational practice for the production of different steel grade groups.

PARTNERS

- Vdeh-betriebsforschungsinstitut
- Gmbh (BFI) Gmbh
- Rhi
- Magnesita Gmbh (RHIM) Gmbh
- Sidenor
- Investigacion y Desarrollosa
- Aktienesellschaft
- Der Dillinger Huttenwerke
- Minkon
- SP Zoo

START YEAR

2019

END YEAR

2022

BUDGET

1 500 000€

FUNDING

RFCS 847256

A photograph of a modern library interior. The room features curved, white bookshelves filled with books, set against a dark blue background. The lighting is dramatic, with bright, curved light fixtures illuminating the space. The overall atmosphere is clean, organized, and contemporary.

COMPLETED PROJECTS

LIFE FUNDED PROJECTS

LIFE CERAM - ZERO WASTE IN CERAMIC TILE MANUFACTURE

AIM

LIFE12 ENV/ES/230-LIFE CERAM is a project co-funded by the European Commission. The project's main objective is to achieve zero-waste in the manufacture of ceramic tiles. To achieve this, it aims to develop a new ceramic tile product made out of ceramic manufacturing residues. The main objectives of the project are:

- Developing a new type of ceramic tile for outdoor application (urban paving) that can incorporate in the body and glaze high content of ceramic waste. Other energy-intensive process wastes (from power plants or glass manufacturing) will also be considered.
- Designing a highly sustainable body preparation process for manufacturing the above ceramic tiles, based on dry milling technologies, capable of recycling all type of ceramic wastes.



START YEAR

2013

END YEAR

2016

BUDGET

799 502 €

FUNDING

LIFE

PARTNERS

5 partners from Spain, including:

- Ceramic Industry Research Association (ITC-AICE) - Spain
- Asociación Española de Fabricantes de Azulejos y Pavimentos Cerámicos (ASCER)
- Keros Cerámica, S. A.
- <http://www.lifeceram.eu/en/the-project/members.aspx>
- http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4675&docType=pdf

LINKS

LIFE SANITSER - SANITARYWARE PRODUCTION: USE OF WASTE GLASS FOR SAVING ENERGY AND RESOURCES

AIM

The objective of this project was to revise the production process in the ceramic sanitaryware sector by introducing glass cullet waste from urban waste disposal in ceramic blends for producing sanitaryware. Results are expected soon.



PARTNERS

- Minerali
- Industriali
- Gemica
- Setec
- Life Cycle Engineering

LINKS

- <http://www.sanitser.eu/en>

START YEAR

2013

END YEAR

2017

BUDGET

2 298 282 €

FUNDING

LIFE

ENVIP - NEW ENVIRONMENTALLY FRIENDLY FORMING TECHNIQUE OF CERAMIC SANITARYWARE BY ISOSTATIC PRESSING

AIM

The main goal of the LIFE ENVIP project was to construct on a pre-industrial scale a prototype facility for forming sanitary wares by isostatic pressing of granulated body. This innovative technology is a promising alternative to the granulated body. This innovative technology is a promising alternative to the traditional method.

The main specific objectives of the project were to:

- Eliminate the water consumption associated with the traditional forming process by pressure slip casting;
- Reduce the volume of wastewater generated in the process;
- Reduce energy consumption and CO₂ emissions;
- Identify the optimal conditions for the industrial forming process of sanitary wares with different geometries and dimensions;
- Validate the compositions for different ceramic pastes used in the isostatic pressing process;
- Disseminate the environmental improvements achieved with the new forming technology across the EU;
- Identify, validate and communicate the application of this innovative technology, which can be potentially considered as a Best Available Technique to update the BREF in the sanitary wares' industry.



START YEAR

2013

END YEAR

2015

BUDGET

1 791 078 €

FUNDING

LIFE

PARTNERS

- Roca Sanitario, SA

LINKS

- http://ec.europa.eu/environment/life/project/Projects/index.cfm?useaction=search.dspPage&n_proj_id=4630&docType=pdf

LASERFIRING - CLIMATE CHANGE ADAPTATION OF THE STRUCTURAL CERAMICS INDUSTRY BY DECREASING THE FIRING TEMPERATURE USING LASER TECHNOLOGY

AIM

The LASERFIRING project aimed to develop a new method for manufacturing structural ceramics using laser technology in the firing phase, allowing firing at lower temperatures. In the particular case of refractory bricks, the new process would reduce the firing temperature from 1 300 °C to 900 °C, without compromising the aesthetic or structural properties. The laser technology would replace part of the firing step. Laser surface treatment allows the conservation of the technological properties of the ceramics, even at a lower firing temperature. The new procedure requires a new drying system and a new furnace in which the laser tool will be integrated. This new approach would allow the firing temperature to be reduced by between 100 and 500 °C, resulting in a considerable reduction in GHG emissions in the structural ceramics industry.

PARTNERS

- Physicgm, Spain Asociación para la Investigación y Desarrollo Industrial de los Recursos Naturales (AITEMIN), Spain Easylasser, Spain



START YEAR

2010

END YEAR

2013

BUDGET

2 468 358 €

FUNDING

LIFE

LINKS

- https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_pr oj_id=3659
- https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=home.showFile&rep=file&fil=LIFE09_ENV_ES_000435_LAYMAN_ES.pdf

LIFE CLAYGLASS - ADAPTATION TO CLIMATE CHANGE BY THE STRUCTURAL CERAMICS INDUSTRY THROUGH THE USE OF RECYCLED GLASS AS PASTRY

AIM

The LIFE CLAYGLASS project aims to reduce the environmental impact of the ceramics sector by demonstrating the technical and economic feasibility of producing ceramic tiles using any type of recycled glass as a flux material. In doing so, the project hopes to reduce CO2 emissions from the firing process and provide a commercial use for waste glass streams that are otherwise difficult to recycle.

Specifically, the project will:

- analyse and characterise types of glass and clay
- introduce a glass collection and transportation system - with storage and logistics arrangements adapted to the demand of the ceramics industries
- define optimal treatment of glass and clay as raw materials in the manufacture of stoneware products
- establish a pilot installation for glass treatment - milling - for the ceramics industry

The addition of the recycled glass to the mix will reduce the demand for new raw materials from natural resources. It will also reduce the required firing temperature from around 1250°C to around 1100°C, which will provide associated reduction in energy consumption and CO2 emissions.

LINKS

- https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_pr oj_id=4689&docType=pdf

START YEAR

2013

END YEAR

2016

BUDGET

1 977 222 €

FUNDING

LIFE

PARTNERS

- Asociación para la Investigación y Desarrollo Industrial de los Recursos Naturales, Spain
- Aristotle University Thessaloniki – Special Account for Research funds, Greece Ladrillos
- More SL, Spain
- Reciclajes Pozo-Canada SL, Spain
- Asociación Reinica, Spain

FP6 FUNDED PROJECTS

AIM

The overall aim of this project is to provide legislators with useful data for defining RCS in air limits. Setting a single low limit to encourage continual improvement, but allowing concessions based on proven reduced risks associated with certain RCS forms is seen as a possible way forward. The project was focused on different industries of the ceramic sector: tiles, tableware, sanitary ware, refractory, bricks and roofing tiles. The project team showed that the probability of crystalline silica penetrating into the lung depends on the size of the particle. Large particles are exhaled anyway. Mathematical modelling revealed that only a fraction of the particle size distribution at a certain exposure level of RCS actually reaches the inner lung. The results will enable a revision of the exposures experienced by workers. Together with the toxicity data developed for different forms of RCS, concessions can then be proposed according to the types of material used and the manufacturing conditions.

LINKS

- http://cordis.europa.eu/project/rcn/107609_en.html
- http://www.keramverbaende.de/ez/medien/docs/siliceram_75dpi.pdf
- http://cordis.europa.eu/result/rcn/49663_en.html

SILICERAM - STUDIES AIMING AT ASSISTING LEGISLATION AND ENCOURAGING CONTINUAL IMPROVEMENT STRATEGIES IN THE FIELD OF RESPIRABLE CRYSTALLINE SILICA

START YEAR

2004

END YEAR

2007

BUDGET

2 216 306 €

FUNDING

FP6

PARTNERS

38 partners from 7 countries, including:

- British Ceramic Confederation - UK
- Confederation des Industries Ceramique de France - France
- Associacao Portuguesa da Industria de Ceramica - Portugal
- Refractarios Alfran S.A. - Spain



NOVACOAT - REPLACEMENT OF CONVENTIONAL GLAZE ON TILES AND OTHER HIGH TEMPERATURE PROCESSED MATERIALS WITH NOVEL HYBRID COATING

AIM

The NOVACOAT project investigated hybrid inorganic-organic low temperature coating technology for wall tile manufacturing.

The NOVACOAT consortium developed a nanocomposite coating as an alternative to the glaze layer in wall tile manufacturing. Various hybrid compositions were developed during the project and were tested for commercial suitability for use in bathrooms and kitchens. Durability was identified as a problem of the hybrid coatings as they did not achieve the desirable high chemical (alkali, acid) and abrasion resistance required.

In spite of not achieving these durability criteria, the project offered valuable opportunities to explore the design possibilities of hybrid coatings. A range of novel visual effects were demonstrated which cannot be obtained via high temperature firing, such as holograms, fluorescents, and a broader colour palette more generally.



START YEAR

TBC

END YEAR

TBC

BUDGET

TBC

FUNDING

FP6

FP7 FUNDED PROJECTS

AIM

The project aims at developing innovative systems for masonry enclosures, to be used for façades, envelopes and internal partitions of reinforced concrete framed buildings, to derive sound concepts for their analysis and to develop reliable, simple and efficient methods for their design in the everyday engineering practice. The final result and the impact of the project will be the effective integration of the new materials, techniques and methodologies in the construction practice, for increasing safety and quality of life. At the same time, the development of new masonry enclosure systems will increase, in a period of great crisis, the competitiveness of SMEs and Industry involved in the construction and clay masonry unit-manufacturing sector. The pre-normative research issues that will be tackled through the definition of performance requirements and design methods will increase the impact of Associations in the code evolution process, and will favour development of skills for designers and service providers.

LINKS

- http://www.keramverbaende.de/ez/medien/docs/siliceram_75dpi.pdf
- <http://www.insysme.eu/>
- http://cordis.europa.eu/project/rcn/110090_en.html

INSYSME – INNOVATIVE SYSTEMS FOR EARTHQUAKE RESISTANT MASONRY ENCLOSURES IN R.C. BUILDINGS

START YEAR

2013

END YEAR

2016

BUDGET

2 697 131€

FUNDING

FP7

PARTNERS

16 partners from 7 countries, including:

- Tiles and bricks Europe AISBL – Belgium
- Associacao portuguesa da industria de ceramica – Portugal
- Centro tecnologico da ceramica e do vidro - Portugal
- Arbeitsgemeinschaft mauerziegel im bundesverband der deutschen ziegelindustrie - Germany
- Associazione nazionale degli industriali dei laterizi - Italy

RESTAR - REVIEW AND IMPROVEMENT OF TESTING STANDARDS FOR REFRACTORY PRODUCTS

AIM

The central objective of this project is to increase the competitiveness of the European SME refractory producers. This will be achieved by generating up-to-date EN testing standards as a save guidance for the producers. An extensive investigation of the current EN testing methods, designs of experiments and interlaboratory tests, more specifically collaborative tests, involving the major European refractory testing laboratories will be the key approach to attain this objective. For a successful review of the EN testing standards and an effective dissemination of the results, a strong and broad-based cooperation between transnational partners is planned. For this purpose, the European SME-AG for the refractory industry is involved and brings together the most active European testing laboratories and SMEs to conduct a large scale and in-depth study of EN testing standards. On the basis of the expertise and results gained during the experimental investigations of the ReStaR project, drafts for revised testing standards and recommendations for the investigated EN testing standards were worked out.

PARTNERS

12 partners from 7 countries, including:

- Forschungsgemeinschaft Feuerfest e.V.
– Germany
- Cerame-Unie – Belgium
- Fundacion ITMA - Spain
- Icar techniques and research materials refractory SA – France
- Institute of ceramics and building materials – Poland

LINKS

- <https://www.restar.eu/>
- http://cordis.europa.eu/project/rcn/111314_en.html
- http://cordis.europa.eu/result/rcn/184868_en.html

START YEAR

2013

END YEAR

2017

BUDGET

2 298 282 €

FUNDING

LIFE

SILICOAT - INDUSTRIAL IMPLEMENTATION OF PROCESSES TO RENDER RCS SAFER IN MANUFACTURING PROCESSES

AIM

The main objective of the present project is the industrial implementation of these treatments in the ceramic manufacturing processes, thus transforming the quartz-containing raw materials into intrinsically safe products. The characteristics of the ceramic companies and their manufacturing processes made them especially suitable candidates. Furthermore, the experience gained in these industries will help in developing general-purpose treatments. SILICOAT project has contributed a technically and economically feasible treatment to render the quartz used in the traditional ceramic industries intrinsically safe. In contrast with traditional measures of corrective nature, the SILICOAT treatment enables the RCS exposure risk to be addressed from its origin: the substance itself.

LINKS

- http://cordis.europa.eu/result/rcn/181741_en.html
- http://cordis.europa.eu/project/rcn/100961_en.html

START YEAR

2011

END YEAR

2014

BUDGET

1 552 203 €

FUNDING

FP7

PARTNERS

- 11 partners from 4 countries:
- Ceramic Industry Research Association (ITC-AICE) - Spain
 - Associacao Portuguesa da Industria de Ceramica - Portugal
 - Ceramica Flaminia Spa - Spain



OTHER FUNDED PROJECTS

MAGF- MICROWAVE ASSISTED GAS FIRING

AIM

At the Danish Technological Institute (DTI), a project is currently underway to develop microwave-assisted gas firing (MAGF) in the clay brick and tile industry. A MAGF chamber kiln has recently been installed at the DTI. This kiln is a prototype, to be used for tests and experiments during and after the project, in order to upscale and develop MAGF technology.

The main objective is to reduce energy consumption for the drying and firing of brick, while the energy source is transformed from fossil fuels to electricity, and potentially from renewable energy. This is obtained by using new MAGF (microwave Assisted Gas Firing) technology. The goal is that the MAGF technology can be considered ready for implementation for the industry in general.

LINKS

- <https://www.dti.dk/specialists/masonry-and-tile-roofing/ceramic-production-using-microwaves/23527,3>

START YEAR

2014

END YEAR

2017

BUDGET

11,42 mio. DKK

FUNDING

Danish Technology Institute

PARTNERS

8 partners from 3 countries, including:

- 4 universities (DK, UK, and Italy)
- 2 Danish Brickworks
- 2 companies specialized in digital modelling and industrial processing



