

Occupational safety and health

research lines



The Instituto de Tecnología Cerámica (ITC) is a concerted mixed Institute, established by agreement between the Ceramic Industry Research Association (AICE) and Universitat Jaume I of Castellón, which originated in 1969 in response to the needs of companies from the Spanish ceramic cluster. During its more than 40-year history, ITC has articulated a successful university–business cooperation system that has borne its fruits, witness the significant development of the Spanish ceramic tile manufacturing industry.

ITC is committed to providing solid support for Spanish ceramic companies in the defence and enhancement of their strategic positioning in the current global context, principally through innovation-enabling research and development actions, but also through whatever activities might serve to foster the competitiveness and growth of the sector, always based on sustainability criteria and commitment to societal well-being.

ITC's mission is focused on spearheading technology innovation and design processes in the Spanish ceramic sector, anticipating market and consumer needs regarding the uses and applications of ceramic materials, through professionalised management of a qualified human team committed to excellence in the sector.

The competence attained through ITC's wide-ranging research activity enables ITC today to extend its field of action to other types of processes and materials. Particularly noteworthy have been ITC's actions in the field of energy efficiency and the minimisation of industry's environmental impact, as well as in the functionalisation of ceramic surfaces and the achievement of new technical performance and aesthetic features of products related to the habitat hyper-sector and to other industries, such as the high-tech tool, advanced ceramics, automotive, petrochemical sectors, etc.

occupational safety and health

El ITC, en su apoyo al sector cerámico, ha iniciado una nueva línea de actuación en el área de seguridad y salud laboral. Las líneas principales en las que está trabajando actualmente el ITC dentro de esta área temática son las siguientes:

OVER 1000 R&D PROJECTS DEVELOPED THROUGHOUT THE HISTORY OF ITC, AMOUNTING TO ALMOST 40 MILLION EUROS.

Respirable crystalline silica

It is well known that the inhalation of crystalline silica, a widely used raw material in all traditional ceramic industry branches, can lead to silicosis, a lung disorder affecting health, which may cause breathing difficulties and even death. A number of organisations have been created to attempt to fight and to eradicate this problem since 1930. Although the International Agency for Research on Cancer (IARC) classified respirable crystalline silica (RCS) as a category 1 carcinogen in 1997, a category that is applied when there is sufficient evidence of carcinogenicity in human beings, there is as yet no clear, enforceable legislation.

Nor have Europe-wide acceptance limits for crystalline silica levels in the environment been defined yet, these limits being different in each EU Member State, so that the Scientific Committee on occupational exposure limits is currently endeavouring to achieve a common European position with relation to acceptable levels.

In this context, ITC has participated in the SILICERAM project: 'Studies aimed at assisting legislation and encouraging continual improvement strategies in the field of respirable crystalline silica', in the Sixth Framework Programme – Horizontal Research Activities developed with the collaboration of small and medium-sized companies, funded by the European Commission.

In addition, ITC is working in collaboration with the IN-SHT, SGS, and the Spanish National Research Council (CSIC) on improving existing methods for the control of worker exposure to RCS dust and its subsequent XRD analysis in order to obtain reliable results that will allow such exposure to be quantified and controlled with the required precision and accuracy.

Use of mercury

At present, one of the most widely used methods of measuring ceramic tile bulk density to control pressing quality is the mercury displacement method. Although some alternative methods have been developed in recent years (such as the system designed and implemented by ITC, in which the bulk density of freshly pressed ceramic tiles is automatically and continuously controlled without the use of mercury), many companies still use mercury to control process quality.

In collaboration with the Union of Benefit Societies and the Spanish Ceramic Tile Manufacturers' Association (ASCER), ITC has published a 'Good Practice Guide on the use of mercury in ceramic tile manufacture', funded by IMPIVA in the project 'Risk assessment on the use of metallic mercury in the determination of ceramic tile bulk density. Preparation of a Good Practice Guide', in the Technology Services for Industry Programme.

IN THE COURSE OF ITS 40-YEAR HISTORY, ITC HAS CARRIED OUT ABOUT
150,000 ANALYSES AND TESTS OF THE MORE THAN **475 DIFFERENT TYPES**
THAT IT CURRENTLY OFFERS.



ITC IS A **REFERENCE PARTNER** IN DIFFERENT NATIONAL AND INTERNATIONAL NETWORKS AND TECHNOLOGY PLATFORMS.

European legislation on chemical substances

ITC has led the 'Coordinated consulting action for the industrial sectors of the Valencia Region on the REACH Regulation', funded by the Business Competitiveness Plan in the IMPIVA Innovation Programme.

ITC also runs the REACH Innova, Information Centre office, an initiative of the Autonomous Government of Valencia, CIERVAL, and REDIT, located at ITC headquarters at Avenida del Mar nº 42, in the town of Castellón.

Most of the Valencian Technology Institutes related to the production sectors have participated in these initiatives with a view to helping companies in the Valencia Region adapt to the REACH Regulation by directly responding to queries and conducting information and training activities.

The first outcome of these actions has been the publication of the Guide 'The REACH Regulation in the industrial fabric of the Valencia Region', consisting of a general part followed by independent sectoral guides.

ITC has qualified staff to advise companies on their adaptation to the new chemical substances regulations, particularly to Regulation (EC) no. 1272/2008 (CLP Regulation).

And, in particular, on the following, related issues:

- › Hazard classification of substances.
- › Preparation of materials safety data sheets and adaptation of such data sheets to the new regulations.
- › Product safety labelling.

In addition, ITC is fully equipped to evaluate the chemical and physical agents customarily present in the occupational environment of ceramic sector companies.

available equipment

ITC sets at the disposal of companies a great technological infrastructure of technical competence endorsed by both ITC's high number of external accreditations and its highly qualified human and instrumental resources, which assure total reliability with regard to the results obtained in the characterisation of raw materials and end products, and in the determination of their behaviour during the production process.



Façade of the ITC Alicer building where the Reach Innova information office is located.

ITC CURRENTLY HAS TECHNICAL AND SCIENTIFIC EQUIPMENT FOR CONDUCTING R&D VALUED AT OVER 9 MILLION EUROS.

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- › Personal and environmental samplers with selective samplers for different pollutants.
 - › CIP 10 personal dust sampler for selective sampling of different powder fractions (inhalable, thoracic, and respirable).
 - › Dustiness tester.
 - › Seven-stage impactor for the determination of particle size distributions of particulate pollutants.
 - › High-volume aerosol sampler.
 - › Sound level meter and noise dosimeter.
 - › Analytical balances for accurate gravimetric determination.
 - › X-ray diffractometer.
 - › Atomic absorption spectrophotometer equipped with a hydride generator.
 - › Scanning electron microscope.
 - › Photoelectron spectrometer.
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technical references

ITC has the capability to transfer the knowledge acquired through the ongoing training of its team of qualified human resources, who keep their knowledge up to date by conducting various R&D&I actions and studies, in addition to participating in numerous science and technology forums worldwide and in different international platforms and consortia. This knowledge, together with that acquired or assimilated from other production sectors, serves to generate the innovation that is transmitted to the companies, which need this to maintain or to enhance their competitiveness.

THE DISSEMINATION OF THE RESULTS OF THE STUDIES CONDUCTED BY ITC FROM THE OUTSET HAS LED TO **600 PUBLICATIONS** OF SCIENTIFIC ARTICLES IN SPECIALISED JOURNALS, **700 COMMUNICATIONS** AT NATIONAL AND INTERNATIONAL CONFERENCES, AS WELL AS THE DEVELOPMENT OF **31 PATENTS**.

R&D&I projects co-financed with public funding

European Commission

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Regional Administration

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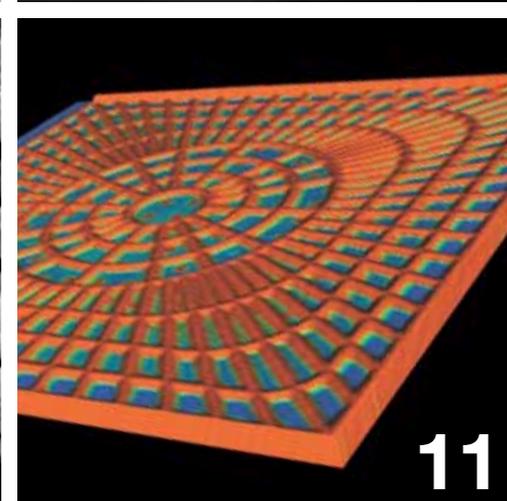
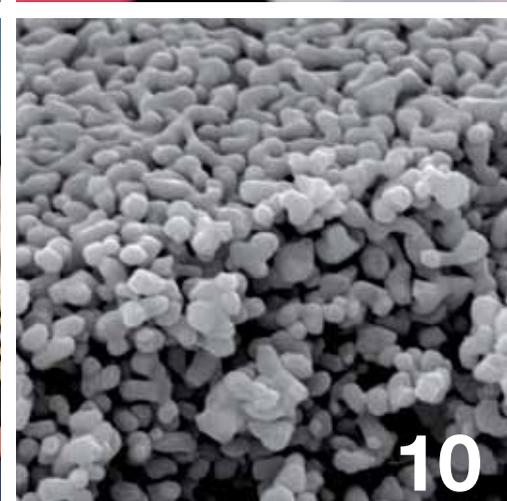
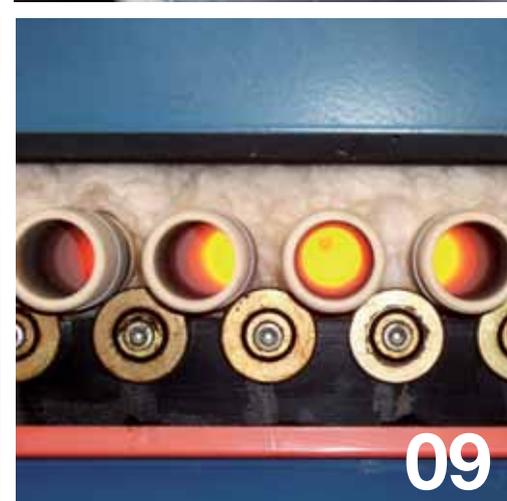
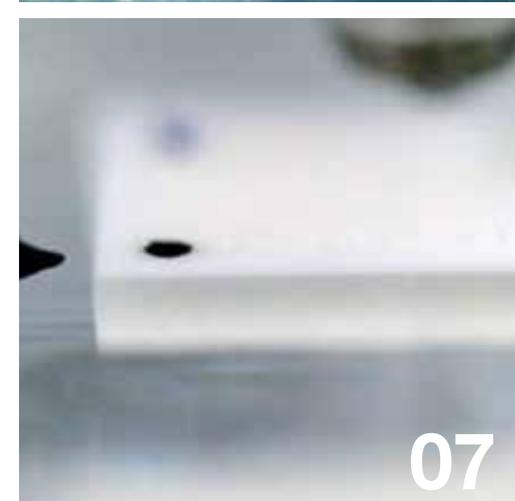
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8000m² SURFACE AREA DEVOTED
TO RESEARCH AND DESIGN SPREAD
OVER TWO HEADQUARTERS.



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