



Performance you can trust

Calderys, WORLD LEADER IN REFRactory SOLUTIONS

With its **worldwide coverage, local presence, technical expertise, and project and installation capabilities**, Calderys is a leading player in refractory applications for both developing and developed markets. Our refractory solutions will help move your business forward in terms of productivity, sustainability, safety, and profitability. ■

Research - Development - Design

At Calderys we understand your industry and its specific operating conditions. Our customised solutions include thermal profiling, selection of the most adapted products to match your process, from the 1,500 active formulas Calderys has developed, selection of anchoring and insulation materials, development of innovative installation techniques, and complete lining design. ■

Production - Logistic

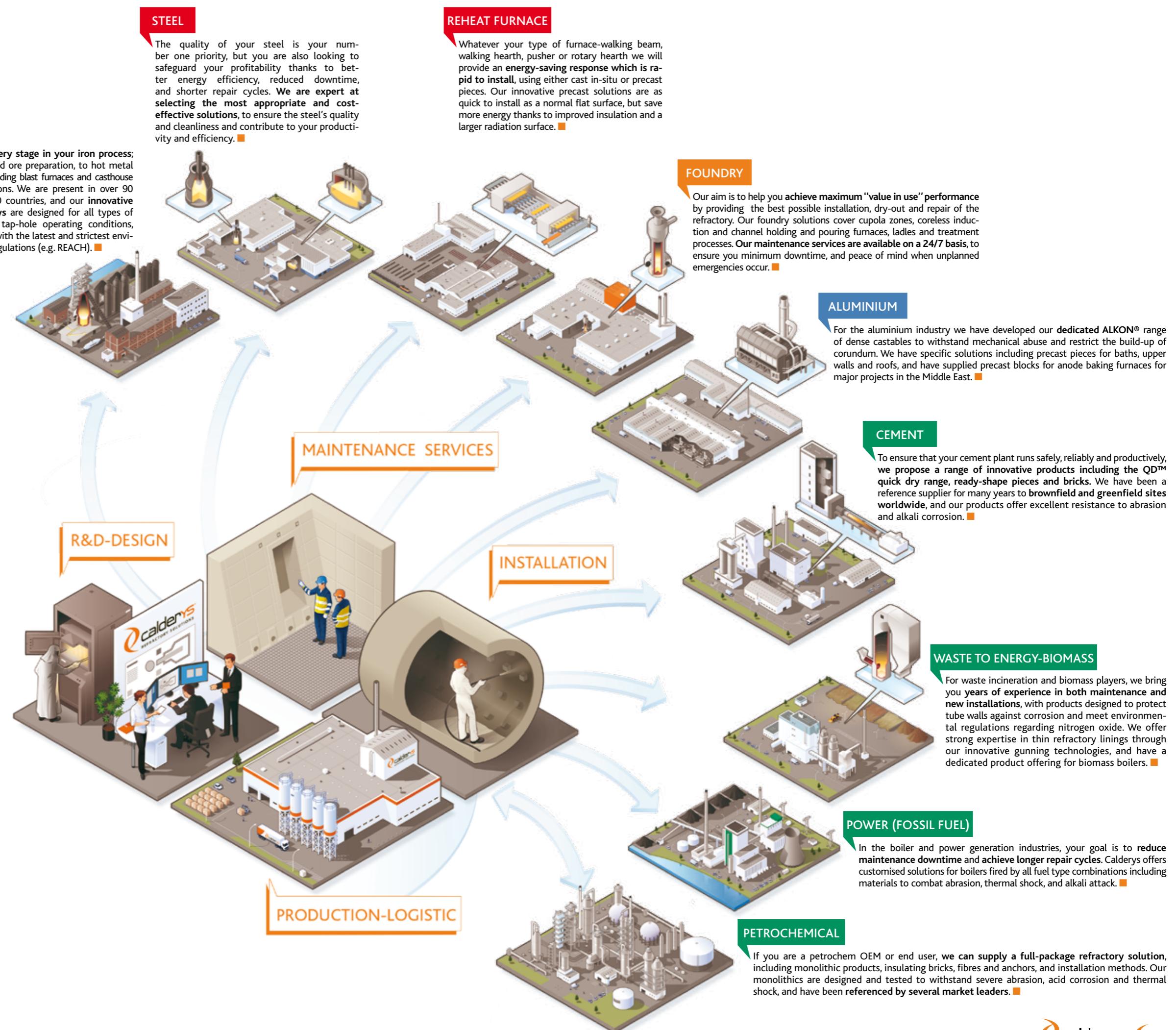
We produce worldwide under strict quality standards, which we apply to all raw materials, to every stage of the production cycle, to the logistics of delivering our products to your site, and to tracing and monitoring them after delivery. ■

Installation

We deliver and install our products worldwide, and are well-equipped to manage your project ourselves. We select, adapt and implement the right installation technique, including detailed dry-out schedules, because skilful application contributes significantly to the monolithic refractory's ultimate performance. ■

Maintenance services

We understand your equipment's performance and its refractory constraints, and we know how to monitor its status. Calderys maintenance includes permanent on-site refractory service, regular and predictive maintenance and repair, as well as trouble shooting, and rapid round-the-clock response to emergencies. ■





"Looking for
**YOUR VERY OWN
REFRACTORY
SOLUTION?"**

RESEARCH DEVELOPMENT DESIGN

Calderys
brings you
customised
innovation

Innovation plays a key role in consolidating our status as world leader in our field, and we are **pioneers in both product development and installation techniques**. We have three international R&D centres and eleven international engineering offices, and have dedicated project management and installation teams

including ceramic, chemical, and metallurgical engineers available to meet your needs in every country. As a responsible company adopting sustainable business practices, we are committed to the use of new and recycled raw materials, and we adapt our products for customers using alternative fuel sources. ■



Key Figures

- **1 500** products to choose from
- **20** new products & design solutions per year providing continuous innovation for liquid metal and thermal applications
- **10** QD™ (Quick Dry) products now available with new products regularly added to the range

INNOVATION

TIME YOU CAN GAIN
WITH CALDERYS
QUICK DRY (QD™)

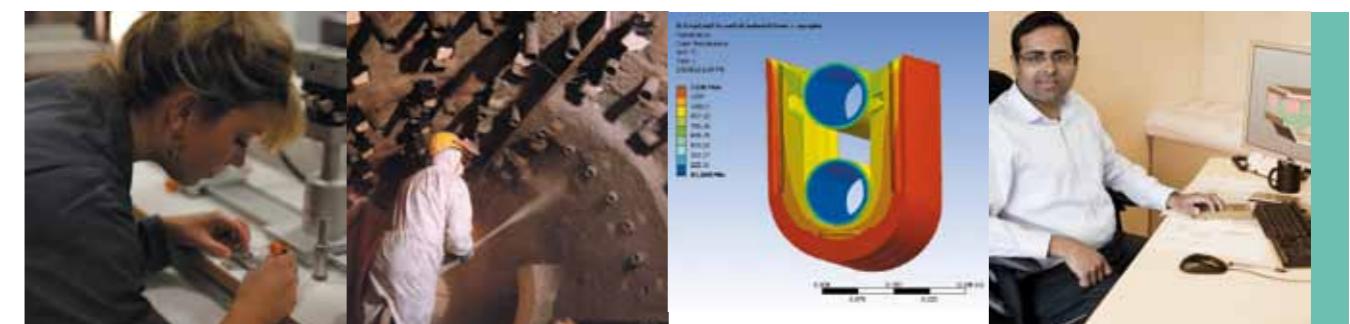


QD™ SPRAYCAST

Calderys' pioneering QD™ SPRAYCAST products combine the technical qualities of a quick-drying cast material with the advantages of application by shotcreting, to meet the need for faster and more cost-effective installation.

QD™ (Quick Dry) uses a no-cement technology which reduces dry-out time by allowing the water to evaporate up to 50% faster than in products containing cement bonding, while maintaining the same refractory properties and safety levels throughout the product's service life.

Now that QD™ is also available in spraycast (shotcrete) form, both production downtime and installation man-hours can be reduced even further.



Product development

Our research laboratories design new products and test them at every stage, including after installation at the customer's plant.

We proactively upgrade the Calderys product range continuously in order to address new markets, incorporate recent technical trends and safety requirements, and respond to customer requirements.

Our QD™ (Quick Dry) products, for example, address your need to minimise downtime and have your equipment back in service as quickly as possible. ■

Installation techniques

Installation represents the double cost of application man-hours and lost production through downtime. We have developed various techniques for repairing by layer, including low porosity dense gunning and shotcreting, and can also deliver pre-cast pieces ready for use.

For safer application we are developing products such as QD™ Hydrogen Free Black castable that do not release hydrogen during installation or products for gunning rather than ramming, because of the damage the latter may cause to hands and arms. ■

Material selection

Our engineers help you choose the right product for each layer of your installation, taking into account specific requirements such as insulation and safety for the back lining, and wear for the work lining.

We use the most sophisticated 3D modeling and simulation technology, including the highly specialised technique of transient and non-linear thermo-mechanical analysis and simulation.

This enables customers to see how a new lining will perform without having to carry out long, expensive on-site tests, and to have information about their production tools which could not be quantified otherwise. ■

Design & Engineering

Your operating conditions must be factored in: the linings in cement plants and incinerators must protect against alkali corrosion and abrasion, while in steel making, the refractory is in contact with the molten metal, and may have a direct impact on its quality.

Our engineering & drawing offices will study the operating conditions of your equipment in detail (e.g. temperature, resistance of materials, chemical reactions) before making the heat transfer calculations, working out the best lining design, and preparing all the documentation that you require. ■



"Who can install the product better than THE PEOPLE WHO DESIGNED IT?"



PRODUCTION LOGISTIC INSTALLATION PROJECT MANAGEMENT

Calderys
designs and
delivers your
products
and projects

Because we make our own products, we are ideally placed to install them and bring the best out of them on your behalf. Our R&D experts are constantly seeking innovative ways to improve application methods, in order to enhance the quality, reduce the labour involved, and improve

safety. Our installation teams cover every region of the world: they use their own equipment, master the latest application techniques, and have the necessary experience to intervene on any type of project: greenfield, brownfield, maintenance, repair... ■

Key Figures

- **3** worldwide brands: CALDE™, ALKON®, and SILICA MIX, as well as well-known local brands like WHYTHEAT in India, and TAICAST in Taiwan and South-East Asia
- **150** major project installations carried out on average per year
- **100** project managers and supervisors to monitor installation of refractories



INNOVATION

QD™ Hydrogen Free Black castable

To meet customer needs for higher safety during installation, QD™ BLACK castables, a range of products for thick linings in foundry cupola applications, offer especially a high degree of safety during setting and dry-out because they do not release hydrogen.

They can be installed at the same speed, and using the same equipment, as traditional black castables containing carbon and SiC, and display equivalent or even better performance. Results monitored on some customer sites have shown that QD™ Hydrogen Free Black castable display a level of wear significantly lower than standard black castables.



Production

The quality of the product which we deliver to you mainly depends on the quality of the raw materials which we select to make it. Our global industrial network allows to train all operators to apply strict quality control procedures to all raw materials, just as they do to every stage of the production cycle. We then use our comprehensive Customer Claim Database to ensure traceability, and monitor and resolve any issues which may arise after delivery. Our products are manufactured under strict process control, ensuring optimum, sustainable quality at all times. ■

Logistics

With our global network, we are ideally equipped to coordinate the delivery of the most complex orders to your site. For trading products (bricks, fibres, anchors, etc...), our purchasing department uses the world's top suppliers, while our customer service teams work with transportation partners and forwarding agents specifically selected for their reliability, to guarantee you on-time, in-full delivery. ■

Installation

Monolithic refractories achieve their final properties at the application stage, and skillful installation contributes significantly to their final performance. This means maintaining a smooth work flow, monitoring dry-out and testing the quality of the installed product, but also anticipating delivery and storage of the materials, and ensuring that safety guidelines are adhered to. We can not only manage all the installation work for you, but we also share our know-how by providing product and installation training for customers and partners at the Calderys Academy. ■

Project management

Calderys' dedicated project managers provide the organisation and coordination for every stage of your installation project, from planning, through implementation and monitoring, to turnkey delivery and commissioning. They manage all the resources involved and ensure that both schedule and budget are respected. Overall, Calderys acts just like an EPC company for refractories. Special attention is paid to the safety of all those involved in the project, including third-party installation staff. ■



*"Looking for less downtime
AND MORE PEACE OF MIND?"*

Calderys
keeps
your process
running



MAINTENANCE SERVICES

When you choose and install a refractory lining, your goal is to increase equipment availability, reduce downtime, and reduce the amount of repairs by increasing campaign lengths. Our goal at Calderys is to **minimise production chain stoppage in plants where our products are installed**. With their combined know-how of the specificities of your production

process and the science of refractories, our troubleshooting experts can "read" the cracks inside your furnace or equipment, assess the condition of the lining and propose the most suitable response. Our maintenance service offer includes predictive maintenance, permanent on-site refractory service, and rapid round-the-clock response to emergencies. ■

Key Figures

- **70** blast furnaces worldwide and most of Europe's leading modern long campaign cupolas maintained by Calderys
- **10** blast furnace hot repairs carried out every year at **more than 30 different customer sites** in India, Western Europe and the CIS
- **Over 50%** of Europe's leading iron foundries use Calderys refractories



INNOVATION

CALDE™ BLOCK ROOF DIAMOND

Reheat furnaces are heavy energy consumers, and lack of insulation in the walls and roof can cause substantial heat loss. The roof is also the most complex part to install, and requires several weeks of labour from a team of experienced workers using traditional ramming methods.

The CALDE™ BLOCK ROOF precast range can be installed by non-experienced workers in just a few days. Once installed, CALDE™ BLOCK ROOF DIAMOND and its pyramid formation, with a much larger radiation area than a traditional flat surface, improves the efficiency of the roof and thereby offers significant energy savings, higher productivity, as well as reduced downtime.



Round-the-clock maintenance

In the foundry and iron industry, you need maintenance teams available to come in by day or night, every day, all year round. We can guarantee your peace of mind by having reliable, experienced technicians on call on a 24/7 basis. In the iron industry, we have in-house capability for blast furnace hot stack repairs, including gunning and shotcreting applications that can be performed by robot. This allows to save time since there is no need to cool down the blast furnace before the repair. ■

Troubleshooting

We carry out diagnoses on your premises according to a shutdown schedule which you define in advance, and we then carry out the work at very short notice, whatever the type and scope of the repair required. With an international network of engineers and supervisors backed up by 18 plants in 16 countries, we can mobilise the appropriate resources in record time. ■

100% outsourced maintenance

For our customers in the iron and steel industry, Calderys can take full responsibility for the refractories used on the casthouse and runners. Our onsite supervisors monitor your equipment closely to ensure both safety and best cost/performance ratio, through innovative products and installation techniques, and that is why a majority of the world's iron and steel leaders entrust Calderys with the permanent maintenance of their equipment. ■

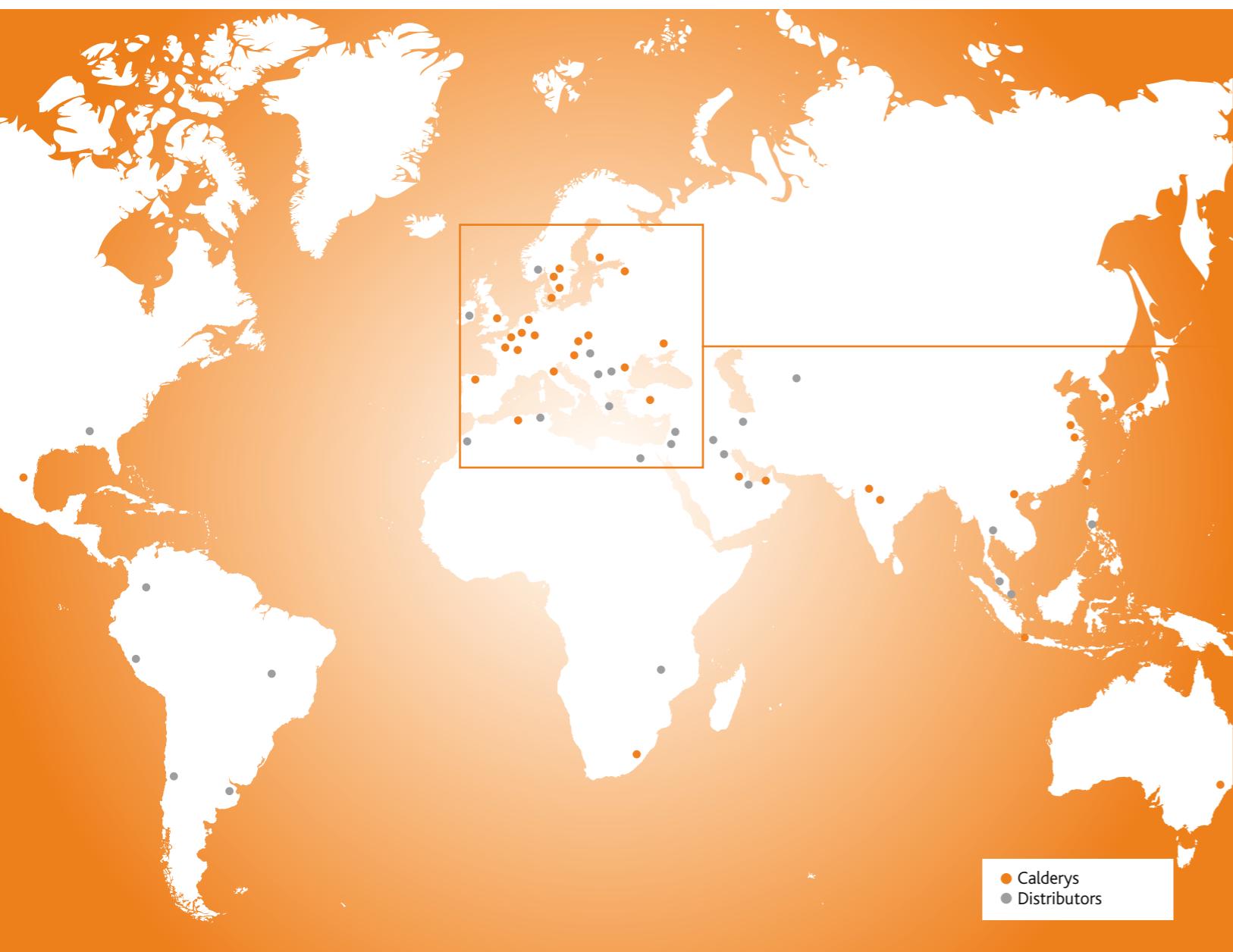
Continuous improvement through maintenance

Our continuous presence alongside the world's leading industrial players means that we are constantly adapting and evolving our solutions to resolve any issues they have with their equipment. We therefore make use of our maintenance activity to generate innovation: our technical teams use the feedback from the customer sites to prepare and carry out several tests on new products every month throughout the world. We proactively monitor your evolving needs and develop the refractory solutions to increase safety and performance, and reduce downtime and energy consumption. ■

Calderys,
**YOUR PARTNER
WORLDWIDE**

- **2 000** employees
- **> €500m** in revenues
- Offices in **over 31 countries** worldwide
- **18** plants in 16 countries
- **450** engineers and project managers
- **600 000** tons of monolithic production per year
- **150** major projects implemented every year

Performance
you can trust



- **90% of the world's industrial leaders** put their trust in Calderys
- Calderys supplies a **vast network of small and medium sized companies** in all industries worldwide
- Calderys works with all the **world's major engineering, OEM and EPC companies**



Calderys' refractory solutions can help make your business more productive, sustainable, safe and profitable. We offer worldwide coverage, local presence, technical expertise, and significant project and installation capabilities.

Calderys is a subsidiary of Imerys, the world leader in mineral-based specialty solutions for industry.

Find our full contact details
on www.calderys.com

