

# ***IRON INDUSTRY TAP-HOLE CLAY***

Refractory Concept Solutions

# CALDERYS PERFORMANCE YOU CAN TRUST

For all industries with extreme temperatures and working conditions, Caldersys is there for you. Combining a global network with local expertise, we offer customised solutions wherever you are: from monolithic refractory to bricks and precast shapes to a full range of engineering and installation services.

## KEY POINTS

Over 100 years of refractory experience

Over 2 300 employees across 33 countries

19 plants in 16 countries totaling 600 000 tons capacity

Annual revenue of over € 500 million

1 Global Technology Centre and 15 Customisation Labs

150 major projects implemented every year

Wholly-owned subsidiary of Imerys Group



# OUR VALUE FOR TAP-HOLE CLAY APPLICATIONS

**CALDERYS** is a leader in providing refractory solutions and services for both iron making and ferroalloys industries. Our company combines innovative products, techniques, engineering know-how, project management and installation services. We have been building successful partnerships with hundreds of customers across the world.

Day by day, we are working with our customers as one team, continuously improving the relationship, always focused on high performance, reliability, adapted solutions and the safety of all our customers' sites whatever the industry we serve: Aluminium, Cement, Foundry, Iron, Petrochem, Power or Steel.

Our market leadership in Tap-Hole Clay is mainly based on the following highlights:

## Safety Culture and Compliance



One of our highlights is to improve the health and safety conditions at your plant. Safety is ensured by the safe installation of our products, our safe installation protocols and practices as well as a strong product to avoid self-opening, reducing gas emissions at the furnace opening and during the handling of the warm product.

Health is also a key point of our technology and mindset, as seen in our resin-bonded Tap-Hole Clays. Our whole range of Tap-Hole Clays has extremely low PAH & BaP values.

In parallel, we have always been proactive in providing adequate training concerning all kinds of PPE protection and the right behaviours to follow in order to reduce the exposure to any encountered risks.





## Focus on Innovation

We are constantly developing innovative products and techniques in order to optimise costs and performance, combining world-class R&D, a Center of Excellence regrouping technical experts, and responsive supply chain and sales departments.

Our desire is to improve your casting performance and to work hand-in-hand with you through an innovative and pioneering path as one team: designing customised Tap-Hole Clay solutions, and anticipating future needs and personalised training programs for you.



## Product Portfolio and Network

Tap-Hole Clay represents a part of our comprehensive product portfolio for the iron industry, including alumina, carbon and silicon carbide based products. This portfolio includes dense castable, self-flowing castable, dry gunning and shotcreting materials, ramming and plastic mixes, dry vibrating mixes, injection and grouting products, Tap-Hole Clay and precast ready shapes.

The Calderys portfolio covers every step of the iron making process; from coke oven and sinter plant, to blast furnaces, casthouse floor and finally hot metal transport and treatment.

All our products are dedicated to optimise your high productivity with a cost effectiveness strategy.

In parallel, our global network of industry experts ensures that we propose the most suitable products based on your requirements and deliver to you superior refractory performance and reliable services.



# OUR SERVICES

## Analysis of the Process

Before the beginning of a project, a deep analysis of the Blast Furnace or the ferroalloys furnaces is carried out in order to well understand the process, all the available equipment, and various conditions on site. This strategy leads to an adapted solution, focused on the customer's needs.

## Customer Net

As a worldwide and valued Company, Calderys proposes a digital device regrouping access to:

- ▶ A large catalogue of products (names and characteristics) with the Technical Data Sheets (TDS), Safety Data Sheets (SDS) and Installation Guidelines;
- ▶ A technical library for documentation, brochures or certificates;
- ▶ A thermal calculator tool in order to obtain heat transfer calculations.

## Design

Based on the extensive analysis, the Tap-Hole Clay is adapted to you with optimised parameters for plugging, casting and removing of the material.

## Installation and Supervision

Calderys provides expert technical guidance to ensure the best Tap-Hole Clay performance during service, offering specialised technical support on refractory, blast furnace processes and casting operation knowledge, as well as experienced supervisors and engineers.

This ensures the best installation of the Tap-Hole Clay so that the customer gets maximum performance in terms of reduction of downtime, reduction in energy requirements, low wastage and optimal performance of our refractory products.







## Logistics

Calderys logistics personnel look after the timely delivery of our products to your sites, ensuring tracking and monitoring after delivery. Our strong network of logistics partners enables us to produce and deliver orders even on short notice.



## Project Management and Engineering

We provide complete project management services including consultation, planning, delivery scheduling, supervision, site management and also direct training for customer personnel. The complete project is driven by highly specialised and skilled teams having the ability to manage projects of all sizes and complexities. Be it large, small or turnkey projects - our end-to-end project management services ensure on-time and on-budget completion.

All the Calderys engineering teams, dedicated to the development of Tap-Hole Clay solutions, help customers to meet their specific needs depending on the furnace process and the available casthouse equipment and practices.



## Quality Control

Quality Control, including the reliability of all our products, is a major target of our strategy. Strict tests and procedures are performed for the Tap-Hole Clay system as well as for raw materials. This paradigm is a worldwide one for all of Calderys.

# THE PRODUCT RANGE FOR TAP-HOLE CLAY: CALDE® TAP

Combining different technologies, CALDERYS comprehensive Tap-Hole Clay range for blast furnaces offers the advantage of being adaptable to any type of blast furnace and casthouse operating conditions whatever the size or the daily production of the furnace.

The development of our Tap-Hole Clays is driven by the objective of responding, with performance and consistency, to the technical and economic requirements of today. Considering the increasingly modern blast furnaces, which have higher productivity rates, reduced production unit costs, and which operate under severe environmental regulation, we are able to propose or adapt our products to all these constraints.

In order to reach these objectives, our CALDE® TAP range is based on various types of time-tested and innovative raw materials (i.e.: silico-alumina aggregates, carbon, carbides, nitrides...) and binding systems (i.e.: resins and carbonaceous binders based on BaP-free organic mixes), giving the products their unique properties.

These properties, combined with quality consistency, enable the best performance even in severe conditions while lowering the specific clay consumption and enabling furnace productivity increases.



Working Conditions on site	Our product range
Standard	OPTI, MULTI, MAXI
Difficult	HIFAST, HIFLEX, HIMAX
Very Difficult	OPTIMAX

# QUICK DRILLING ADVANTAGES

## Quality



- Ensure a regular profile to the tap-hole (without cracks) by limiting hammering: better hearth drainage, less gas leakage.
- Maintain the hole diameter along the entire length of the tap-hole for optimal casting.

## Savings



- Limit the additional costs associated with difficult drilling, especially the over-consumption of drill bits and oxygen lances: **up to 20% savings**.

## Productivity



- **30% reduction of the opening time** compared to a traditional tap-hole clay.
- No production delays due to opening.

## Adaptability

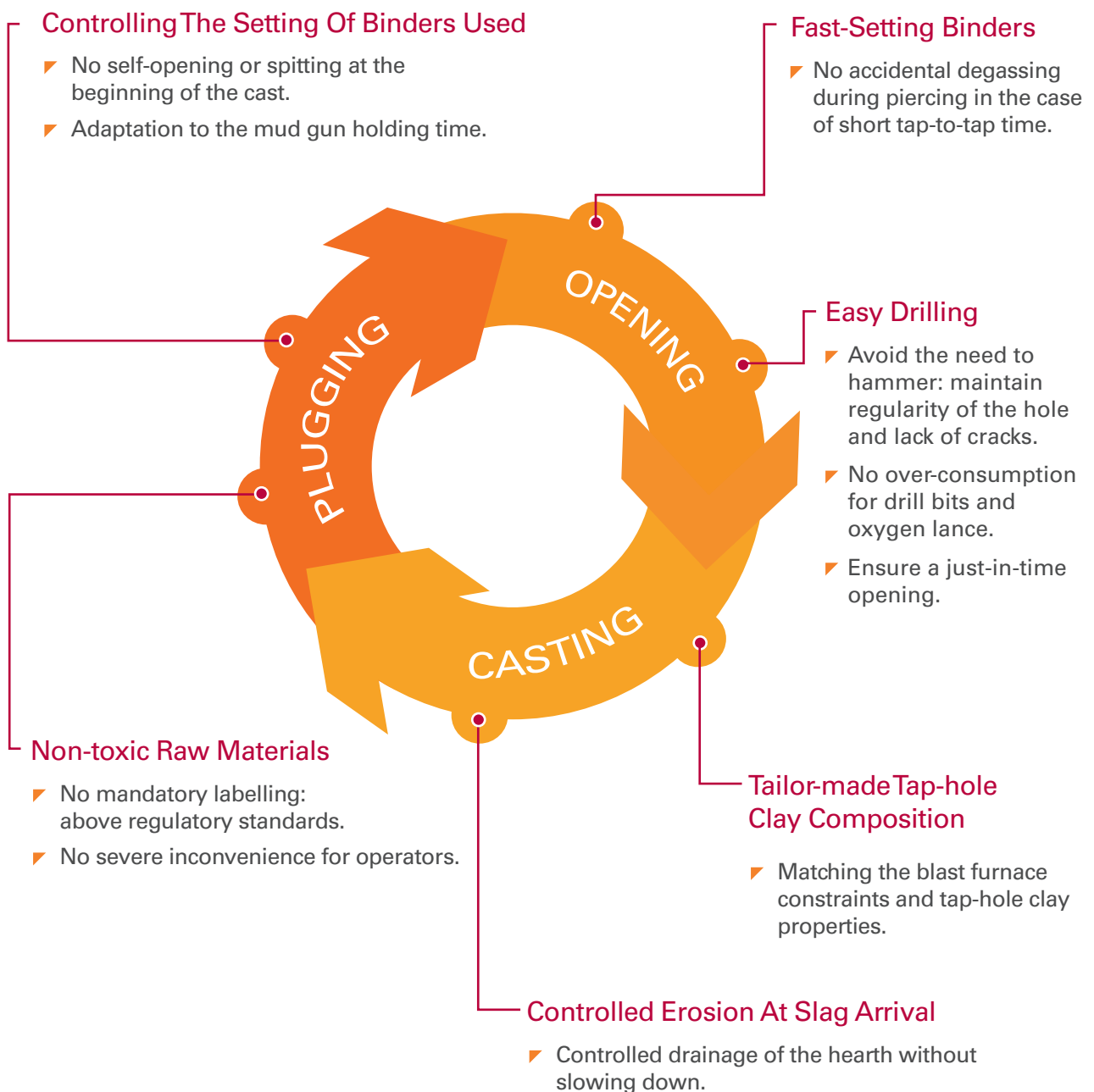


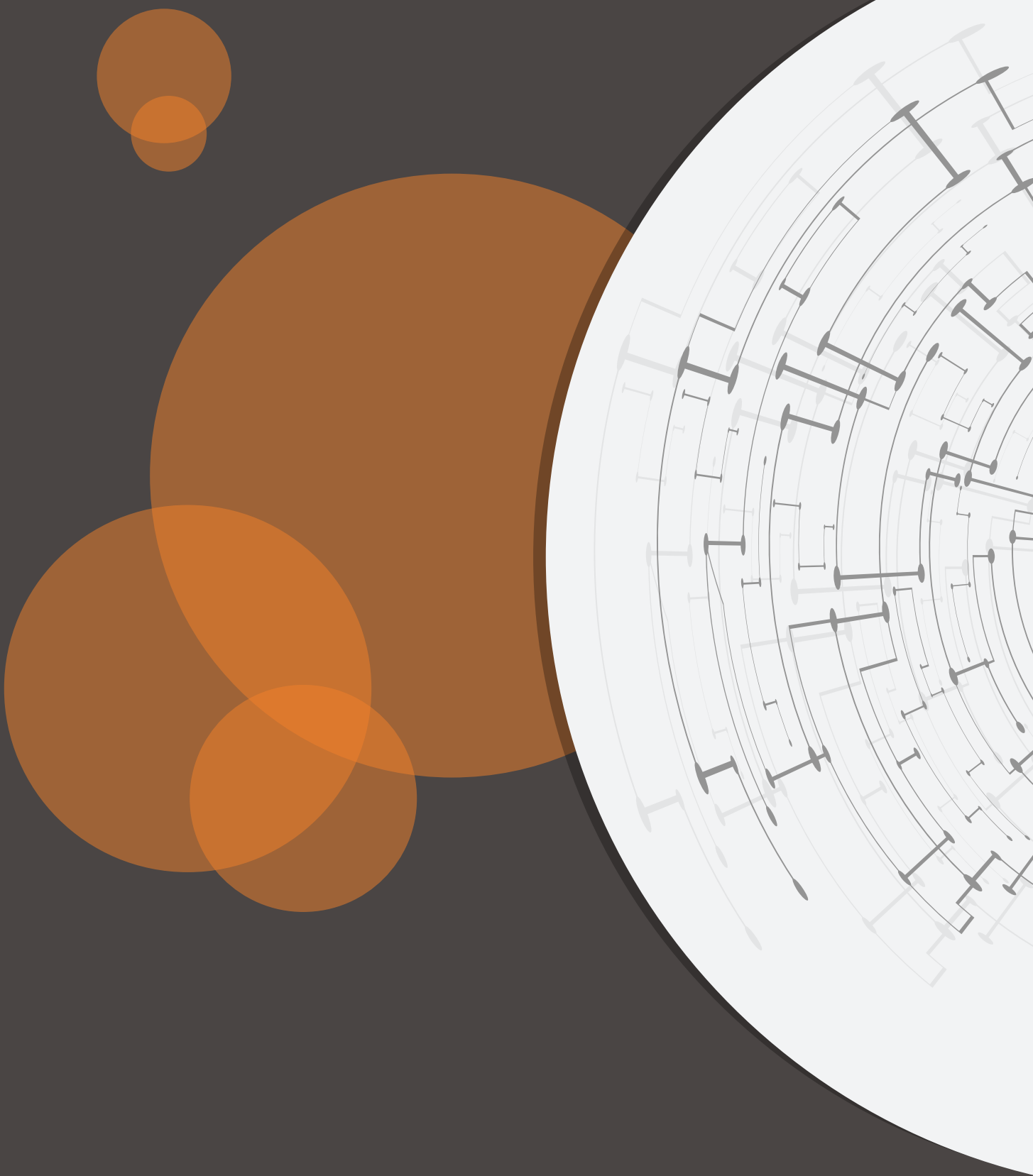
- CALDERYS fine-tunes its tap-hole clays to your constraints in order to provide a fully satisfactory product customised for your process.



# QUICK DRILLING - OUR EXPERTISE AND EXPERIENCE AT YOUR SERVICE

The Quick Drilling line integrates with the CALDERYS range of Tap-Hole Clays for blast furnaces. Each product has a high performance level and provides you with essential benefits for the performance of your process.





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