



**SIBELCO**

# MATERIAL SOLUTIONS FOR GLASS

Gain a competitive edge with our industry leading range of high-performance minerals and secondary raw materials.

*Material solutions advancing life*



# A PARTNERSHIP APPROACH

Glass manufacturing demands stringent standards of quality, care and control. This can only be achieved with a reliable supply of high-calibre raw materials that perform in line with specification to deliver consistent results every time. Which means that your raw materials provider must be a partner you can depend on.

As one of the world's leading and longest-serving providers of minerals and secondary materials for the glass industry, we place our customers at the centre of our business.

We deliver bespoke solutions based on an in-depth understanding of your manufacturing requirements and wider business needs.

We are driven by continuous improvement, working in collaboration with customers worldwide to develop new material solutions that help to improve manufacturing efficiency and enhance product quality to provide a competitive edge.

# THE SIBELCO STANDARD

The Sibelco Standard is our promise to you. The seven elements that make up the Standard ensure that your business always benefits from a reliable supply of innovative, high-quality materials, responsibly mined and delivered to your door on time and in top condition, no matter where in the world you are.

## LEADING RANGE OF MATERIAL SOLUTIONS



From high purity silica to energy saving cullet, we are constantly improving and expanding our range of material solutions for glass. Our portfolio covers the full glass batch, shaped by global and local market trends and the continuously changing needs of our customers.

## MINE-TO-MELT CONSISTENCY



To ensure that our materials always perform predictably and deliver consistent results, we monitor quality at every step of the mining process - from geological surveying and extraction through to processing and delivery.

## BEST IN GLASS TECHNOLOGY & INNOVATION



We turn knowledge gained from extensive R&D into value for our customers. Our global network of laboratories and dedicated team of glass industry specialists provide the highest standards of technical support, ensuring that you always get the best results from our products.

## COMPREHENSIVE SUSTAINABILITY APPROACH



We operate within a sustainability model which supports twelve of the United Nations Sustainable Development Goals. We have established clear sustainability priorities and report annually on our performance against key environmental, social and economic objectives.

## GLOBAL LOGISTICS NETWORK



Glass manufacturing relies on smooth-running, cost-effective logistics. Our global transport and distribution network ensures that products always arrive on time and in top condition, no matter where in the world you are.

## FINANCIAL STRENGTH WITH A LONG-TERM VIEW



We have the financial strength and resources to support your growth ambitions. Founded in 1872 and still privately-owned, we invest in the future with a long-term perspective. Whatever your business strategy, you can count on us today and tomorrow.

## COMMITTED TO SAFETY AND HEALTH



The wellbeing of our colleagues and stakeholders comes before anything else. Safety and health are firmly embedded within our purpose, vision and culture. Our health and safety strategy is deployed across every level of the organisation via our global Going for Zero programme.

# PRODUCT PORTFOLIO

Our range covers all glass batch materials, providing you with a one-stop solution for your raw material requirements. Key product groups include:



## MELTING SANDS

Silica sand is the primary component in glass making. Properties such as chemical purity, grain size and colour play a key role in determining the clarity, strength and appearance of the final glass product.

## SILICA FLOUR

Silica flour increases the melting rate of the glass batch, providing a chemically pure source of silicon dioxide with uniform particle size to maximise pull rates.

## GLASS-GRADE DOLOMITE

Dolomite (a sedimentary carbonate rock) significantly improves resistance to natural or chemical attack and weathering, providing controlled and very low decrepitation levels.

## LOW-IRON DOLOMITE

Mined and processed from Sibelco's unique deposits in Dúrcal, Spain, our low-iron (<140 ppm) and very low-iron (<100 ppm) dolomites are ideal for extra-clear glass. As well as improving clarity, use of these materials helps to cut energy costs, prevent devitrification and reduce refractory corrosion and furnace damage.

## GLASS COLOURANTS

We offer a range of solutions to bring richer colours to container glass, including **PORTAFER**® (iron oxide) and **VITROFER** (iron silicate) for amber bottles and **PORTACHROM**® (chromite) for green.

**MANGALOX**® and **MANGAGRAN**® (manganese dioxide) are used as a pigment in purple and black bottles, and also to control redox in the glass wool manufacturing process.

## ALUMINA-BEARING MINERALS

Alumina plays an important role in improving glass batch melting efficiency whilst bringing other key benefits to the manufacturing process.

Our range of alumina-bearing minerals includes nepheline syenite, mined and processed from our deposits in Norway. With low (0.1%) iron content and high chemical stability, use of nepheline syenite helps to reduce energy and transportation costs, improve chemical resistance and colour control and extend furnace life.

Feldspars are also excellent alumina bearers for improving batch melting, with premium grades possessing very low colouring oxides. Our locally supplied feldspatic sands also possess good melting properties to help you reduce energy consumption.

Sibelco also supplies ATH, a very pure alumina source with low iron oxides levels used in the perfume, tableware and specialty glass industry.

For E-Glass production we offer fibreglass-grade anorthosite.

## CULLET

Use of cullet brings clear commercial and environmental benefits including reduced CO<sub>2</sub> emissions. It can take up to 30% less energy to melt pure cullet than it takes to melt a batch made up entirely of primary raw materials.

Sibelco is at the forefront of glass recycling in Europe, each year transforming over one million tonnes of glass waste into high-quality cullet. Thanks to a combination of new optical sorting technology and process knowhow, we are able to treat waste streams that other recyclers cannot.

Beyond cullet, we are exploring further possibilities for the use of secondary raw materials in glassmaking, such as slags, ashes and other co-products.



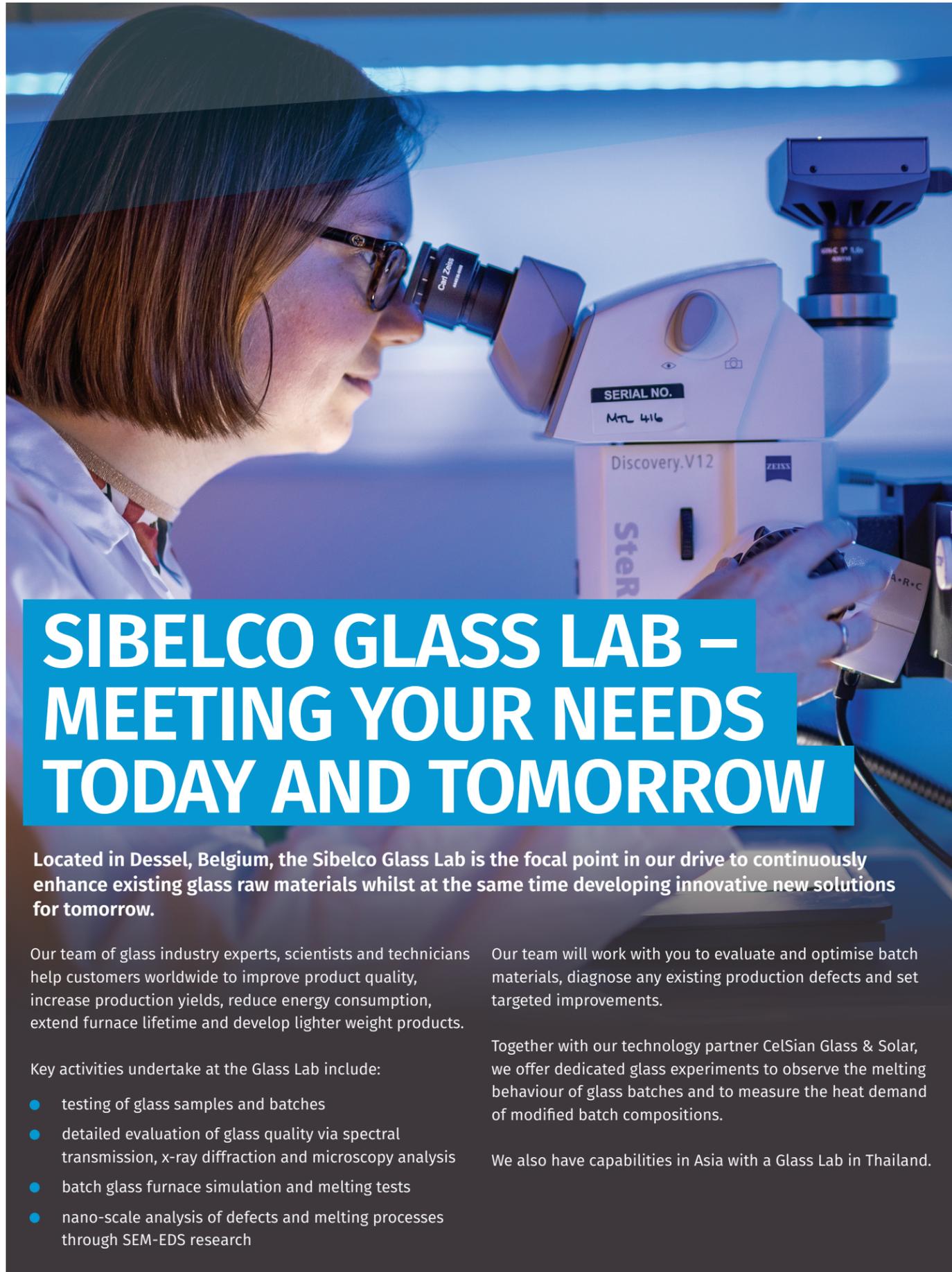
# PRODUCTS AND APPLICATIONS OVERVIEW

Mineral quality and consistency are critical in the production of glass.

Our products play a major role in the furnace performance, energy efficiency and glass quality of the final product.

	Silica				Dolomite			Alumina Carriers				Colouring Oxydes			Li-carrier	Specialties			Recycled Glass
	Ultra Low iron sand	Low iron sand	Standard sand	Powder	Low iron grade	Standard grade	Powder	Nepheline	Feldspar	Anorthosite	ATH	Iron	Chrome	Manganese	Petalite	Decolourising agents	Improving refractory Index	Secondary Materials	Cullet
												PORTAFER® & FERROMIN	PORTACHROM®	MANGALOX® & MANGAGRAN®	VITROFLUX®	COBALT/SELENIUM MIX	BARYTE	IRON SILICATES	
Flat glass (high transmission)	V	V			V		V		V		V					V			
Flat glass (normal)			V			V	V	V	V			V							V
Tableware	V	V	V		V		V	V	V		V	V	V	V	V	V	V		V
Crystal	V	V		V			V				V					V	V		
Packaging/Container glass	V	V	V		V	V	V	V	V			V	V	V		V		V	V
Technical glass	V	V		V			V	V	V		V			V			V		
Glass Fibre				V	V		V			V									V

We also have options to premix special additives (cobalt, selenium, ao) with silica to allow better incorporation and blending into the furnace. Please get in touch with any questions you may have.



# SIBELCO GLASS LAB – MEETING YOUR NEEDS TODAY AND TOMORROW

Located in Dessel, Belgium, the Sibelco Glass Lab is the focal point in our drive to continuously enhance existing glass raw materials whilst at the same time developing innovative new solutions for tomorrow.

Our team of glass industry experts, scientists and technicians help customers worldwide to improve product quality, increase production yields, reduce energy consumption, extend furnace lifetime and develop lighter weight products.

Key activities undertaken at the Glass Lab include:

- testing of glass samples and batches
- detailed evaluation of glass quality via spectral transmission, x-ray diffraction and microscopy analysis
- batch glass furnace simulation and melting tests
- nano-scale analysis of defects and melting processes through SEM-EDS research

Our team will work with you to evaluate and optimise batch materials, diagnose any existing production defects and set targeted improvements.

Together with our technology partner CelSian Glass & Solar, we offer dedicated glass experiments to observe the melting behaviour of glass batches and to measure the heat demand of modified batch compositions.

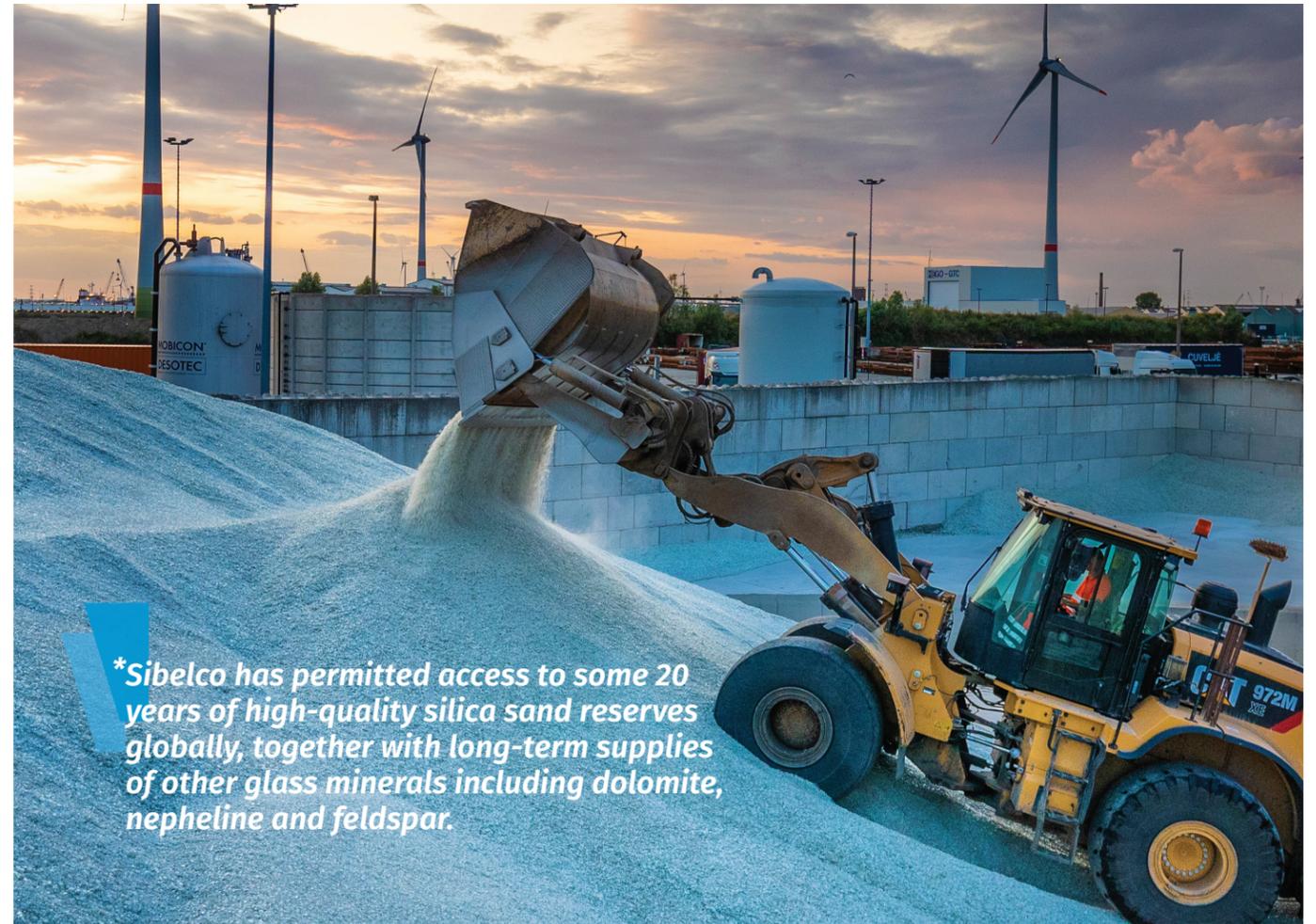
We also have capabilities in Asia with a Glass Lab in Thailand.

# SUPPORTING A MORE SUSTAINABLE GLASS INDUSTRY

We believe that raw materials have a key role to play in the low-carbon economy. That's why we are working closely with customers and industry experts to develop material solutions to support more sustainable glass manufacturing processes.

Our approach focuses on three areas:

- **Availability of Minerals:** ensuring access to a long-term supply\* of high quality, responsibly mined minerals, creating certainty for our customers and their future strategies.
- **Optimisation of Materials:** refining existing batch materials and developing brand new solutions to help reduce energy usage, improve end-product quality and minimise waste.
- **Increased use of Recycled Materials:** further expansion of our glass recycling business to help customers leverage the environmental and economic benefits of cullet, whilst exploring further possibilities for other secondary materials such as slags, ashes and other co-products.



*\*Sibelco has permitted access to some 20 years of high-quality silica sand reserves globally, together with long-term supplies of other glass minerals including dolomite, nepheline and feldspar.*

# CREATING ENVIRONMENTAL VALUE

At Sibelco, we strive to minimise the environmental impact of our mining activities. We have set ourselves a clear goal to reduce carbon emissions and improve energy efficiency in line with the EU's Green Deal targets for 2030, and to improve water management at our sites worldwide.

Before mining begins, we are already planning ahead to ensure that all land disturbed by our activities is proactively managed and restored, both during the operational phase of quarrying and when mineral extraction ends. We strive to ensure that we leave a positive legacy with net gains for the environment and local communities.

Our customers depend on us to provide an uninterrupted, long-term supply of high-quality materials. That's why we are always looking to the future, working continuously to identify and secure access to strategically located mineral deposits worldwide. Our goal is to maintain a minimum of 25 years of property life for at least 80% of our own-mine business by gross margin.

Guided by the Sibelco Code of Sustainable Conduct, our approach focuses on five main areas:



LAND MANAGEMENT



RESOURCE MANAGEMENT



ENERGY EFFICIENCY



WATER MANAGEMENT



LOCAL PARTNERSHIPS



Material solutions advancing life

# MATERIAL SOLUTIONS ADVANCING LIFE

With over 160 production sites across 30 countries, Sibelco is one of the world's leading providers of industrial minerals and other material solutions.

We create materials that power progress. Our products help to build homes, cities and vehicles; to support the supply of electricity, food and clean water; to create new technologies like smartphones, low-energy lighting and solar panels.

We do this within a robust sustainability framework, always balancing economic performance with environmental stewardship and social responsibility.

For further information please email us at: [glass@sibelco.com](mailto:glass@sibelco.com)

