

Best in Glass

Industrial gases & leading technologies
for your business success

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Introduction

For decades, BOC has delivered innovative gas-enabled technologies to the glass industry in the UK & Ireland and shared technical expertise with its customers to extract the most out of glass production.

Today, BOC continues to draw on those proven capabilities to help the glass sector meet tough market conditions and the technical and environmental challenges it faces.

By combining innovation, top-class products, end-to-end solutions and expertise, BOC can improve productivity in glass manufacturing, enhance glass quality, reduce emissions to meet regulation targets and increase furnace pull rates.

With this fusion of service, products and know-how BOC ensures that it provides the right tailored solution for you.

- Innovation
- Products
- Solutions
- Expertise



Innovation



Transforming your business with revolutionary ideas

As the UK's leading supplier of glass melting and glass forming technologies, BOC innovates continually to transform the way customers in the industry operate and help them meet their growth targets.

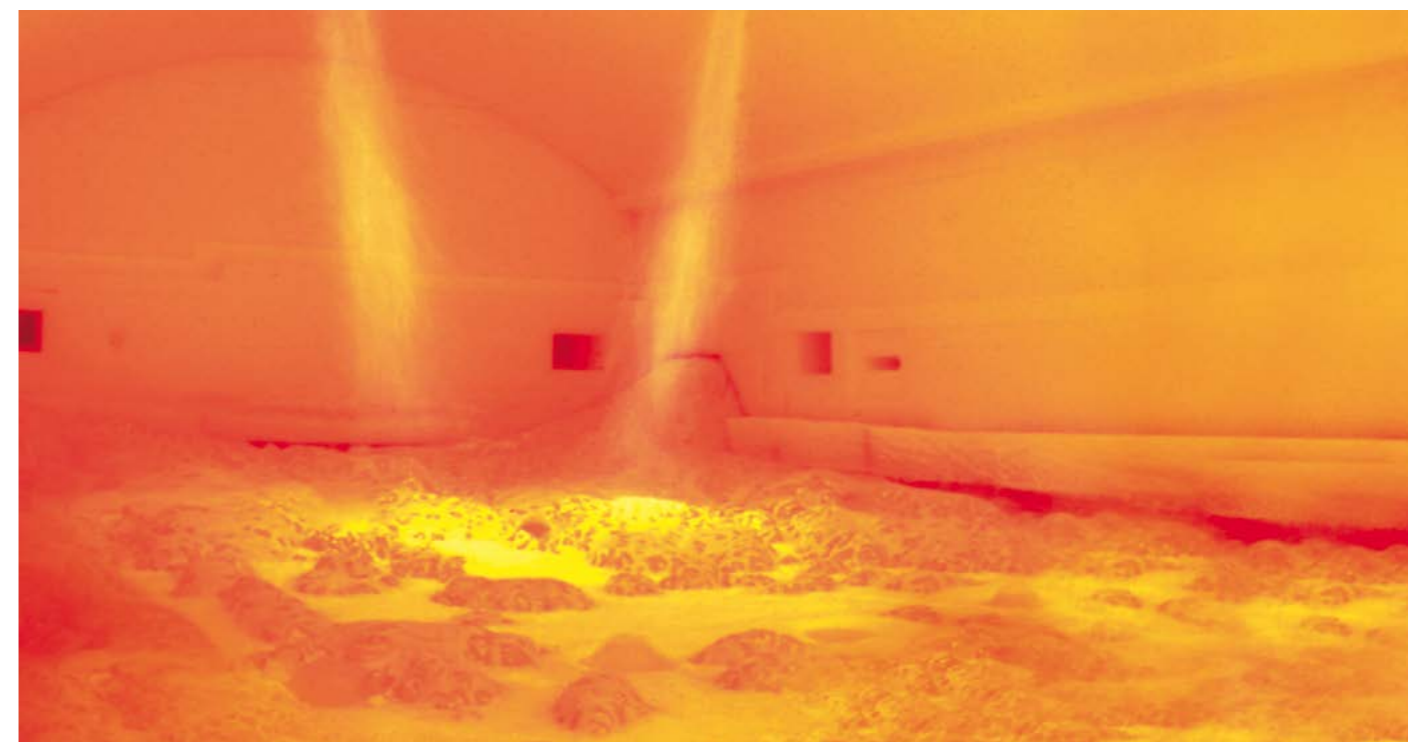
It does so by working in close partnership with its glass sector customers, developing a suite of unmatched technologies, which over the years have extracted the most from glass manufacturing processes.

BOC is the only UK supplier with more than 120 years' experience in industrial gases. It uses this in-depth know-how and its cross industry expertise to develop revolutionary gas-enabled technologies such as the HYDROPOX® glass polishing technology and the COROX® range of glass melting technologies.

Exclusive to BOC, these and other technologies represent years of investment and close work with leading glass manufacturers worldwide to create flexible solutions that meet increasingly strict legislation on emissions and growing pressures to improve furnace performance and reduce operation, raw material and energy costs.



Products



Melting technologies

COROX® Hotspot Boost and Reverse Hotspot Boost are BOC's latest patent pending innovations to prove beneficial for customers that operate end-port furnaces as it increases throughput and improves quality of glass.

These horizontal oxy-fuel burner systems are ideal for customers needing additional glass capacity due to furnace restrictions and failing regenerators, without significant capital investment.

Glass manufacturers requiring additional production due to increased orders and those facing furnace design restrictions or failing regenerators could also consider BOC's Convective Glass Melting (CGM) technology.

This roof mounted oxy-fuel burner technology enriches the main combustion air in a glass furnace with oxygen leading to improved melting performances, higher combustion efficiency and more throughput.

BOC also supports glass manufacturers as they seek to lower NOx emissions in existing furnaces to meet new EU-legislation.

With COROX® Low NOx, the benefits of oxygen are harnessed to increase combustion efficiency and flue gas recirculation leading to enhanced glass quality and emissions below 800mg/m3.

COROX® hotspot boost benefits

- Average of 10% increase in capacity for healthy furnaces
- Ailing furnaces retain lost capacity (likely >10%)
- Furnace life extended
- Better glass quality and higher packing rates
- Fuel savings of 1-2% approx.
- Higher margin on incremental capacity increase

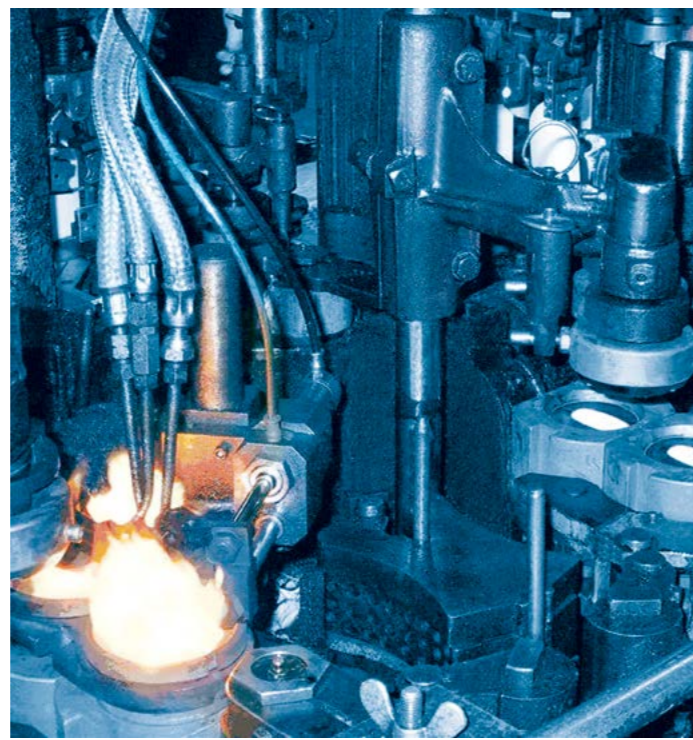
CGM benefits

- Increased melt rates, production rates/quality improvements
- Greater oxy-fuel boosting
- Ideal for Non-Boron glass fibre melting – reduced raw material costs
- Higher profit margin

COROX® low NOx benefits

- NOx emissions reduced by as much as 65%
- Easily integrated into existing furnaces
- Low investment vs. other solutions
- Low space requirement
- Melting capacity can be boosted up to 10%
- Energy consumption reduced 3-5%

Products



Polishing and surface coating technologies

High yields and low rejects, lower production costs, reduced environmental impact and safer, cleaner working environments – these are just some of the benefits of BOC's industrial gas-based flame polishing and surface coating technologies.

HYDROPOX® is an industry leading automated, high quality glass-polishing technology that has transformed glass forming processes for speciality, cosmetic and optical glass producers, as well as those in technical glass manufacture.

The burner system polishes both thin and thick walled glass products using a mix of industrial gases, providing a brilliant finish and high yields. The process anneals micro-cracks in the surface of glass and so is ideal for top quality finishes.

CARBOFLAM®, BOC's automated carbon coating technology, uses a mixture of industrial gases delivered through a special pre-mixed burner system to create consistent results and increased yield of up to 20 per cent.

Container, cosmetic and table glass product manufacturers are among the many customers worldwide who value this reliable, highly automated mould-coating process for its ability to reduce manual intervention and accidents.

CARBOFLAM® benefits

- Quality surfaces
- Reduced surface defects
- Increased yields of up to 20%
- Less mould wear
- Payback within a year

HYDROPOX® benefits

- Premium quality surface
- Increased yields
- Microcracks removed
- Low energy consumption
- Automated process

Calibration gases

With the EU Directive 2010/75/EU requiring glass companies to reduce emissions, there is also a need to monitor emissions from furnaces.

As well as introducing COROX® Reverse Hotspot and COROX® Low NOx technologies to help reduce emissions, BOC's range of specialty gases are essential for calibration of your emissions measuring instruments.

For example, one of our specialist mixtures containing 850 parts per billion of SO₂ in nitrogen can be used to monitor SO₂, which can be a combustion by-product and is also an emission from the rolling process in float furnaces where SO₂ is added as a processing agent.

To find out more about BOC's range of other calibration gases, please call 0800 020 800.

Solutions



More than just gas – End-to-end solutions for the glass industry

It isn't only BOC's mixture of market leading gas-based technologies, technical competence and strong team-working ethos with customers that sets it apart.

BOC's support and understanding of the glass industry's requirements also means it can offer you joined-up, comprehensive solutions that support you throughout a project.

Our complete package represents the gold standard in the industry and includes:

- Full technical evaluations of existing plant
- Feasibility studies
- Individual development projects
- On-site trials and demonstrations
- Computational fluid dynamics (CFD) and mathematical modelling for glass modelling
- Consulting, safety, auditing and training

Expertise

Expert knowledge at every stage

At BOC, our highly trained team of glass experts understands the technical, environmental and compliance challenges the glass industry faces.

They can help your company meet production challenges with the most innovative industrial gases solutions and technologies, and by working with you at every stage of a project.

From rigorous planning to on-time delivery and post-installation training, our experts can cater to your every need.

As well as BOC's local team of glass specialists, the company can draw upon its global team of experts for opinion and support for critical issues.

Our dedicated Customer Service team is also on hand to help you 24 hours a day, 365 days a year, with a single point of contact to resolve your queries first time, every time.

BOC – turning ideas into solutions.

BOC is a member of The Linde Group, the leading global gases and engineering company. BOC is the UK's largest provider of industrial, specialist and medical gases, as well as related products and services. As a leader in the application of technology, we are constantly looking for new ways to provide our customers with high quality products and innovative solutions.

At BOC we help our customers to create added value, clearly discernible competitive advantage and hence greater profitability. To achieve this we have a comprehensive range of products and services, and technical support which can be customised to meet the individual requirements of our clients.

To keep ahead of the competition in today's market, you need a partner for whom quality, service, process and productivity optimisation are an integral part of customer support. We are there for you and with you, helping to build your success.

BOC's reputation has been forged through partnerships – with customers, with relevant regulatory authorities and with key suppliers. In this way, we deliver comprehensive and consistent benefits to you.

BOC – world-leading knowledge and resources adapted to local requirements.

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