

Medical Device & Equipment Manufacturing





Your ideal partner for developing technologies

Quality and reliability

BOC is the largest provider of industrial, medical and specialist gases in the UK and Ireland.

As a member of the Linde Group a world leading gases and engineering company, BOC combines over 120 years of gas supply expertise with Linde's global capability in optimising high value manufacturing processes, providing an outstanding portfolio of products and services.

With seven air separation units (ASUs) in the UK and the only gas supplier with an ASU in Ireland, BOC has an unrivalled production and distribution network providing you with confidence in an uninterrupted gas supply across atmospheric gases and thousands of different specialist gases and gas mixtures.

In addition to security of supply, we recognise the importance of quality of our high purity and specialist gases. This is assured by our laboratory ISO9001 and ISO17025 accreditations, combined with the surety of full traceability and documentation.

Working in partnership with manufacturers in the medical sector, BOC strives to add value to your manufacturing processes and deliver a flexible and innovative service provision to support your unique business needs with an extensive range of supply solutions



Medical diagnostic apparatus



Cardio devices



Surgical instruments



Orthopaedic implants

BOC and Medical Manufacturing

BOC has partnered and supplied manufacturers within the medical sector for over 40 years. We understand the challenges faced in the development of manufacturing processes to accommodate the industry's unique needs in:

- Improving bio-compatibility
- Embracing miniaturisation
- Improving the wear resistance and fatigue life of implants
- Developing the manufacturing processes of novel alloys such as titanium
- Improving the productivity and efficiency of established manufacturing processes.

Thanks to our experience and unrivalled supply and distribution network, BOC is the only supplier who can provide the exhaustive range of products and services

required to cover the wide range of gas processes used by medical manufacturers.

Combining our leading supply capabilities with unique services, BOC provides customers with:

- Industrial gases provided through a variety of innovative package solutions
- Speciality gases and their mixtures
- Speciality gas equipment
- On-site facilities management services
- Everyday consumables
- On-site process/technical support
- Specialist PPE

How can BOC help you to meet your key manufacturing challenges?

With the demands on healthcare increasing, the medical devices and equipment sector is experiencing significant growth in the UK and Ireland that brings with it a fast paced evolution to existing manufacturing processes.

These rapid and innovative changes such as the shift towards the use of powders in additive manufacturing, the requirements surrounding bio-compatibility and fatigue life and the focus on ensuring effective sterilisation, place different demands on manufacturers that BOC can help you to meet.

Industrial and specialist gases are used for a wide range of different processes that address these requirements.

Additive Manufacturing

Additive Manufacturing techniques such as laser sintering, laser melting and electron beam welding are well established. However, the increased use of titanium based powders for the manufacturing of complex orthopedic implants such as knee and hip joints is making this a critical manufacturing process.

Powders such as titanium and other complex alloys are used for their toughness and improved wear resistance or fatigue life. However, this does present some challenges around mitigating oxidisation, particularly given the combustible nature of these raw materials. Traditionally blanketed in Argon, BOC and Linde are exploring the benefits of utilising specialty gas mixtures and thermal management techniques that might improve the final properties and subsequent performance of the component.

Additive Manufacturing, sometimes referred to as the '3rd Industrial Revolution' is becoming more widespread, and as a result, will in time reduce the requirement for post-work treatment such as milling and grinding.

Component Calibration

Calibration is carried out using a range of gases, from helium for MRI scanners, to zero grade and pharmaceutical mixtures for a variety of other medical diagnostic equipment.

Helium

As part of the Linde Group, BOC has access to 20-25% of the world's commercially available helium, and manages the most diverse sourcing portfolios in the industry. Ensuring security of supply and your peace of mind.

Through sustained investment as demonstrated by the £11m investment in 2007 in a new helium transfill facility in Thame; BOC has more cylinders, liquid dewars, bulk tube trailers and people dedicated to its helium business than any other supplier in the UK.

Zero grade and pharmaceutical mixtures

Quality is critical; all BOC gas mixtures supplied for equipment calibration meet the national standards set by the National Physical Laboratory (NPL), ensuring accuracy in producing Alpha Volumetric mixtures calibrated with a direct comparison to NPL standards.

BOC also provides full traceability of our gas mixtures and demonstrates the mandatory compliance and validated



Cutting



Leak detection

quality assurance as verified by our ISO 9001 and ISO17525 accreditations.

Cutting

Requirements regarding cut edge quality have increased significantly, particularly in the cutting requirements of surgical equipment and stents where cut edge quality is of paramount importance.

For laser based cutting processes, BOC provides nitrogen, oxygen and carbon dioxide to fully support your gas needs. In addition, BOC has a range of laser gas supply solutions offered through LASERLINE® which includes:

- Industrial and laser gas mixtures
- Specialist gas control equipment
- Maintenance provision through our OnStream service
- Engineering support
- Technical support & advice

Visit www.BOCOnline.co.uk/LASERLINE for more information.

Leak Detection

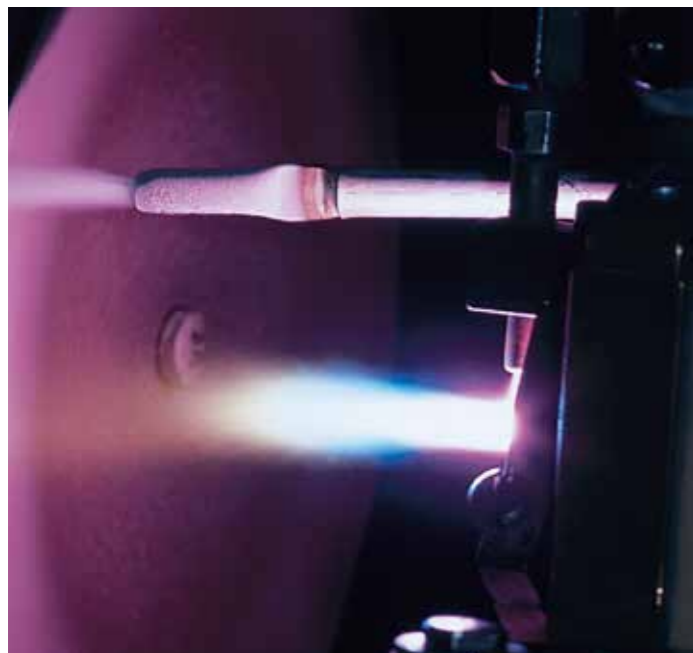
Leak detection in the manufacture of devices such as pace makers and defibrillators will always remain a critical quality control.

Helium remains the best choice of gas for detecting minute leaks in a vacuum and other gas tight systems. It has specific qualities that contribute to this.

- A very small atomic size
- Non toxic
- Inert
- Non-flammable
- Non-condensable
- Not normally present in the atmosphere

Consequently it is easy to detect by a small instrument mass spectrometer tuned to detect helium.

Given the essential quality control requirements of helium, confidence in your supply is critical. Thanks to BOC's unrivalled global supply chain capability, our security of supply will ensure your peace of mind.



Plasma spraying

Plasma Spraying

The focus on improving the fatigue life of implants has increased the use of thermal spraying which is designed to toughen the surface material.

The plasma is produced by an arc which is constricted and burns in BOC supplied gases such as argon, helium, nitrogen, hydrogen or their mixtures. This causes the gases to dissociate and ionize; they attain high discharge velocities and on recombination, transfer their thermal energy to the spray particles.

BOC's technological developments can also support manufacturers in their application of high velocity plasma. We supply specially shaped nozzle attachments such as those for the spraying of calcium related deposits onto hip joints in order to improve bio-compatibility.

Sterilisation

Many medical components and instruments must be sterilised before being packaged. Most commonly used is Ethylene Oxide, a highly effective sterilant and widely used to sterilise heat-sensitive tools and equipment.

BOC can supply pure ethylene oxide as well as a range of EO CO₂ blends.



Ethylene Oxide sterilisation

Owing to the properties of this gas, BOC assists our medical manufacturing customers who require Ethylene Oxide with:

- Safe handling and management protocols
- Pre-delivery site assessments

Laser and Micro-Welding

As the trend for miniaturisation continues particularly in the development of cardio and intravenous devices, welding requirements have evolved significantly.

The focus on quality improvements, combined with devices getting smaller has meant that traditional TIG or GMAW welding are no longer suitable. Microscopic features have to be welded with minimal heat affected zones and provide highly resolved markings for traceability of instruments and orthopaedic implants.

Subsequently, the developments of laser and micro-welding have become more widely adopted, as supported by BOC's LASERLINE® product range that includes a variety of specialist cylinder laser gas mixtures and services.

One stop for your supply solutions

An uninterrupted, continuous and effective supply from BOC ensures your productivity is maximised and the finished product quality meets your requirements. As the only industrial gases company in the UK to offer an exhaustive range of supply services, you can be sure of impartial advice on the best supply solution for your needs.

As well as a full range of standard small, medium and large size cylinders you can also choose from a broad selection of solutions and supply modes that provide even greater value.





Bulk Storage

For large users; the most cost effective gaseous and cryogenic solution for continuous supply.



ECOVAR® – Onsite Gas Generation

Providing a continuous, reliable and independent gas supply for Oxygen, Nitrogen and Hydrogen.



Manifold Cylinder Pallets

Typically containing 15 cylinders, and recommended for users that require more gas than single cylinders; ideal when productivity is paramount.



CRYOSPEED®

Ideal for smaller volume users who require liquid product delivered directly into cryogenic vessels, and want to avoid the manual handling and downtime associated with single cylinders.



Cylinders

Offering a wide range of individual, high-pressure cylinders suitable for smaller volumes of gas. Available in numerous sizes and pressures, cylinders offer a high degree of versatility and flexibility, supplied in a range of packages from steel cylinders to innovative solutions including GENIE® and VIVANTOS®.



Helium

Helium can be supplied either as a gas in pressurised single gas cylinders and manifolded cylinder pallets. For larger customers in bulk tube trailers, or as a liquid in cryogenic containers known as dewars and bulk ISO containers.



GENIE® Cylinders

More gas, more portable, more intelligent
GENIE® is a revolutionary, mobile and lightweight cylinder package that transforms the way gas is used. A GENIE® cylinder contains 30% more gas than its standard steel equivalent, providing a longer usage time. It features a state-of-the-art digital display and low contents alarm indicating how much gas is remaining.

Watch the GENIE® video at
www.BOCOnline.co.uk/GENIE



BOC, tailored customer service

BOC provides customer services solutions to suit each customer from direct account management, to the use of our dedicated UK based customer service team.

Our customer service centre, is available 24hrs a day, 365 days a year designed to respond to and resolve all your needs first time, every time.

You are also able to manage many aspects of your account with our bespoke online service www.BOCOnlineshop.com

BOC products and services – supporting your business



High purity regulator for "Laserpure" gases



Specialised personal protective equipment

LASERLINE® – laser gas control equipment

Whether you have a CO₂, Nd:YAG, excimer or diode laser, equipment quality as well is essential not only to maintain the laser's reliability but also to ensure the highest process productivity. BOC produces a range of laser gas regulation equipment which is designed and engineered to meet or exceed the high quality standards specified by today's laser manufacturers

Specialist PPE

BOC takes safety in the workplace very seriously, which is why we have selected a range of the most innovative and highly rated products on the market that are specifically suited for the needs of advanced manufacturing. Using our knowledge, we can help you to provide a safe environment for your workplace.

Welding Products

BOC's Industrial Supplies and Services division is the number one supplier of welding products to UK manufacturers. Our network of 72 Gas & Gear retail stores and in excess of 300 partners and agents ensures BOC can supply customers of all sizes with a range of services unrivalled by any of our competitors.

BOC's Application Experts

BOC's Technical Support Engineers (TSEs) are at the cutting edge of technological development of metal fabrication and gas consuming processes.

Day to day technical support is provided through a network of highly trained Technical Support Engineers (TSEs). They work with you to advise on the use of BOC's products efficiently and safely, delivered through a comprehensive range of safety training courses via open workshops held at your site.

Shop for your PPE and products online at www.BOCOnlineshop.co.uk



Facilities management service



BOC's Manufacturing Technology Centre, Wolverhampton

Onsite Facilities Management

BOC's unique facilities management service manages gas requirements and BOC owned gas equipment for customers who have large and complex gas needs.

They operate as quality controller for all gas supplied to and mixed onsite. This includes the maintenance and calibration of analytical instrumentation to ensure compliance with all required legislation and safety standards as well as stock levels. Our service removes the need for your personnel to manage your gas supply and allows you to concentrate on what you do best.

Membership Accreditations

BOC are members of, and work with a number of external associations, developing solutions to suit the existing and future needs of our customers

Technological Development & Innovation

As part of the Linde Group, BOC has a global network of process experts and access to world class research and development facilities in Munich, Germany and at BOC's Manufacturing Technology Centre (MTC) in Wolverhampton.

The MTC has excellent links and partnerships with many key equipment manufacturers and industry bodies, equipping BOC to provide unbiased advice on the best solutions to suit specific manufacturing processes.



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

For enquiries please contact:

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Special Products Sales Office

For calibration gas mixtures, carrier gases and associated pressure control equipment
The Priestley Centre, 10 Priestley Road,
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