



Company Capability

FMB Oxford Limited
Units 1-3 Ferry Mills
Osney Mead
Oxford OX2 0ES
United Kingdom
www.fmb-oxford.com



FMB Oxford

FMB Oxford is an established leader in the supply of Synchrotron beamline components and systems. The company has a large installed customer base within Synchrotron facilities worldwide.

Our core competences are the project management, design, final assembly, test, installation and commissioning of beamline systems and beamline components.



Our modern 1800m² facility located in Oxford, UK, provides sufficient space to co-locate commercial, engineering and manufacturing teams under one roof. Plans are in hand to add a further 460m² during 2015.

Continual investment in new production, test and design facilities, together with the recruitment and development of key staff, ensures that FMB Oxford remains at the forefront of beamline systems supply. Following investment in a new ISO7/ISO5 cleanroom in 2014, there are plans to significantly increase the cleanroom area in 2015.

At the present time FMB's experienced and highly motivated workforce consists of more than 100 people split across our Oxford and Berlin Sites.

~50% Manufacturing / Material Control / Quality

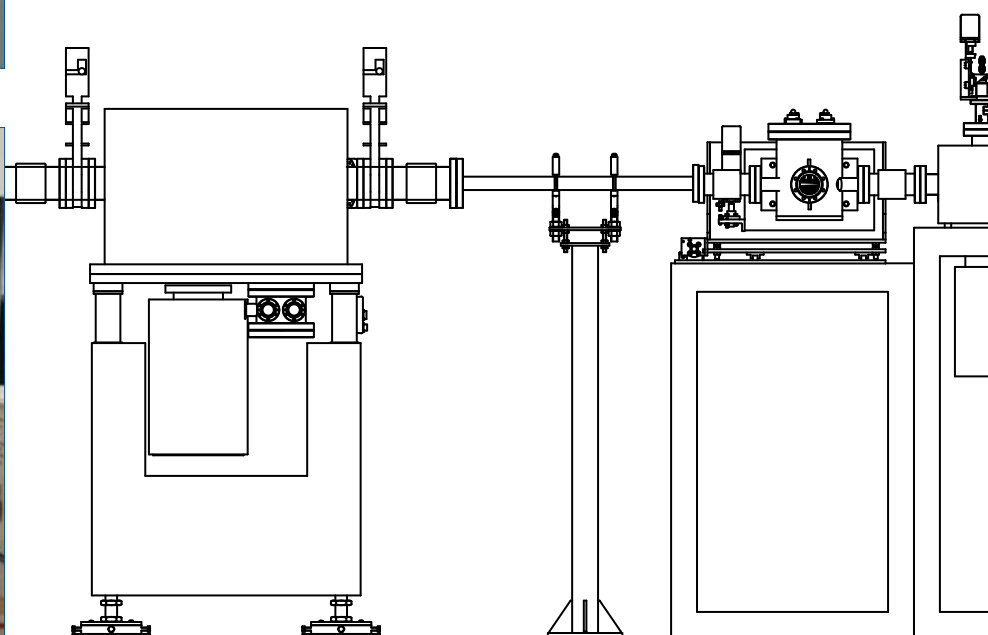
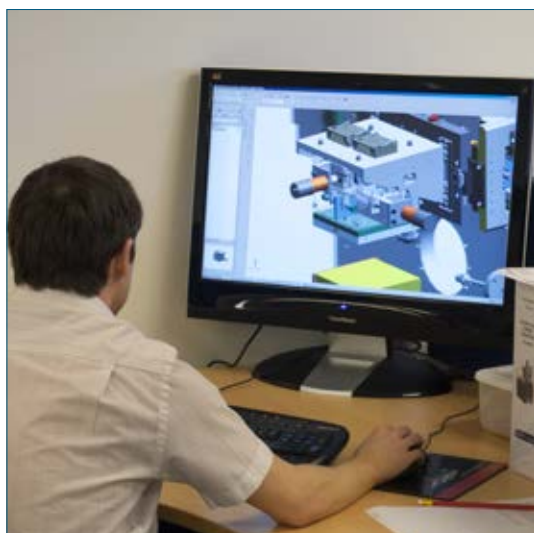
~35% Science / Design Engineering / Project Management

~15% Commercial / Financial / Management / Administration

FMB Oxford is an ISO9001:2008 accredited company. We have established business processes that cover all areas of our activity. These processes are continually evaluated and improved as part of our ongoing commitment to continuous improvement.

By working in close partnership with our customers we ensure that their beamline requirements are met in a timely and cost effective way.

It is also FMB Oxford policy to form long-term relationships with key suppliers of components, subsystems and software, who are themselves leading suppliers in their own field.



A brief history...

1990

In the early 1990s Oxford instruments Synchrotron Group, which had been manufacturing Superconducting Compact Synchrotrons and Cyclotrons, based on Osney Mead a small distance away from the current location, began to supply beamline components to many of the then new 3rd generation light sources.



The business grew rapidly, and soon diversified from the core focus of Oxford Instruments' business.

2001

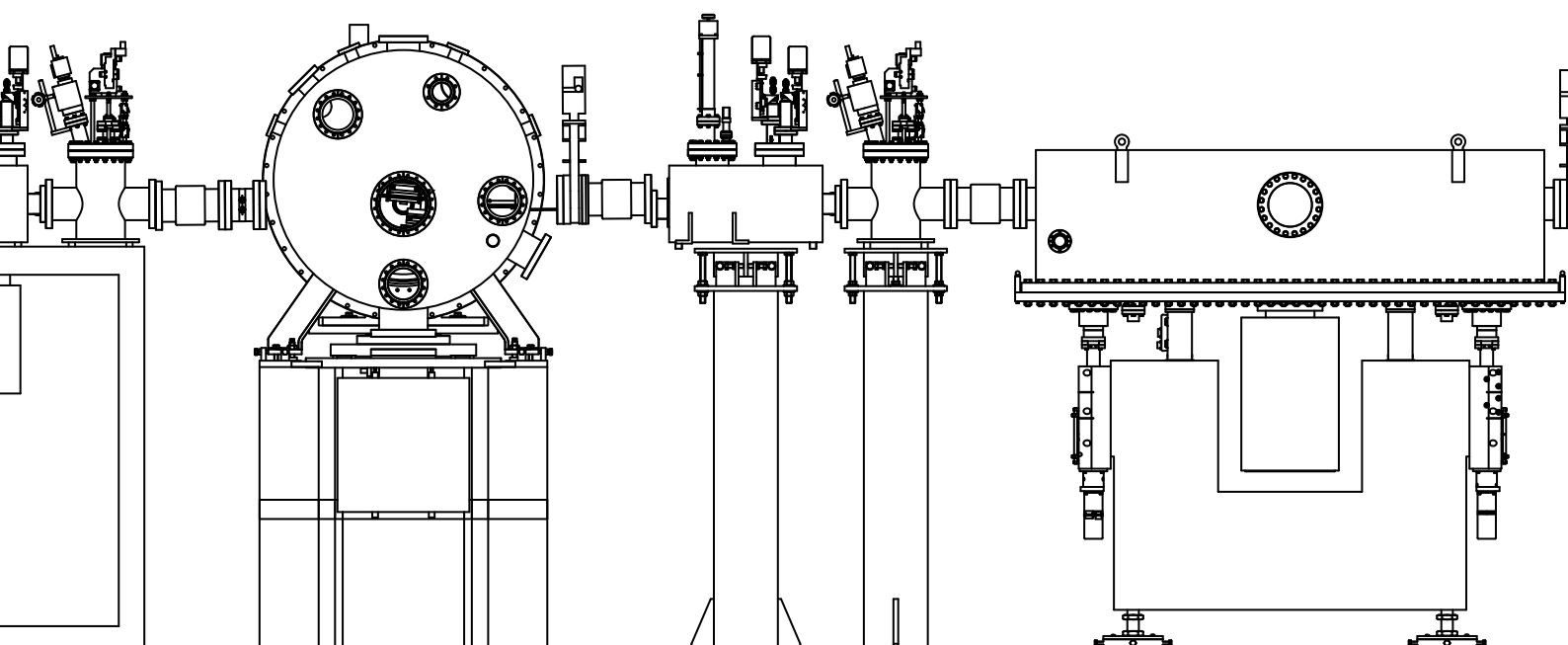
In January 2001 Oxford Instruments sold the Group to Danfysik A/S and Oxford Danfysik was created.



In March 2002, Oxford Danfysik moved into a new factory, which had been completely refurbished to suit our synchrotron beamline business. The current layout includes a UHV cleaning area, extensive 'in-air' assembly areas and three dedicated 'in-vacuum' clean assembly areas. Within the main clean assembly area there is an inner isolation room containing a large metrology table on anti-vibration feet. The room is air-conditioned and used for the testing of precision motion systems such as DCMs and Mirrors.

2007

In October 2007, FMB Berlin acquired Oxford Danfysik, renaming the company to FMB Oxford. The combined business has the largest installed base and the greatest range of products of any supplier in the synchrotron community. The company, supported by its strong proven supplier base, has the design capability and manufacturing capacity to handle any of your beamline needs whether these are for the smallest component or for multiple turnkey beamlines operating at soft or hard x-ray wavelengths.



The FMB team has a diverse range of qualifications, backgrounds and skills that provide a firm foundation on which to deliver added-value products and services.

Our Beamline Scientists can interpret customer requirements and propose beamline concepts that deliver world-class performance under real operating conditions. Using this resource the company has undertaken a number of successful feasibility studies on behalf of Synchrotron facilities worldwide.

Our Operations team comprises of Engineers, Scientists, Technicians, Materials and Quality staff and has extensive experience in managing, procuring, constructing and installing beamline equipment.

Supporting processes include:

- Product design
- Supplier qualification and management
- Capacity scheduling
- Product assembly and test
- Product inspection and testing
- Systems integration
- Project management and review
- Quality management

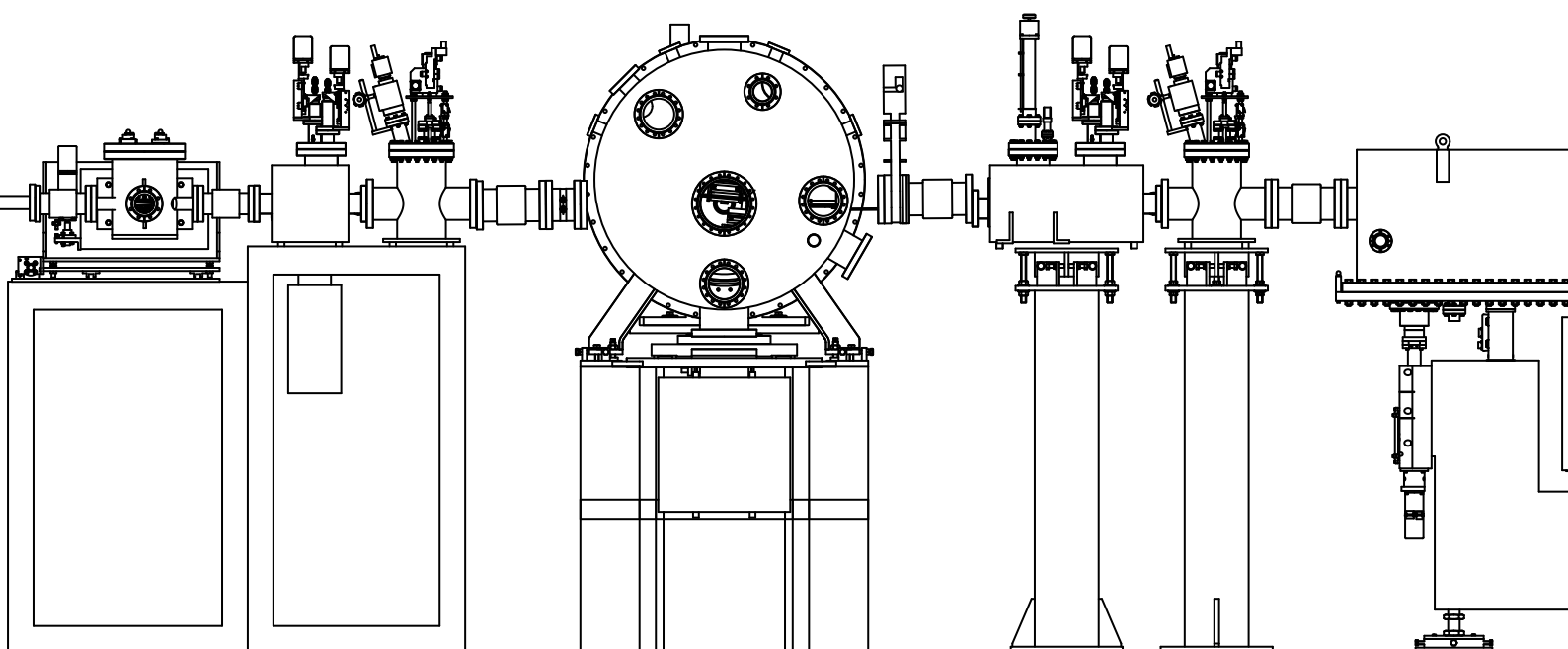
Our design capabilities include:

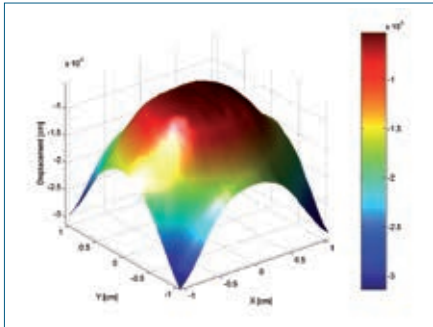
- In-vacuum and in-air precision actuation and positioning
- Thermal analysis of components in beam
- 3D computer aided design
- Cryogenic cooling systems
- Closed loop motor control systems
- UHV vessel design
- Vibration damping
- Custom design solutions



Manufacturing

The manufacturing team is under the direct control of the Operations Director and is responsible for beamline elements such as mirror systems, slits, shutters, detectors and diagnostic devices. The business supplies separate beamline elements directly to customers, as well as fully integrated beamline systems.





Engineering

The Engineering team comprises of Designers and Beamline Scientists who work closely with customers to ensure that their requirements can be realised using robust and proven standard modules as much as possible. This results in the most cost effective achievement of the customer's functional requirement.



Project Management

All projects have Project Managers appointed and are internally reviewed by the management team at least once per month. This ensures that all projects have the right level of management focus and remain on track. The formal review includes progress against key milestones, cost control and management of risk.

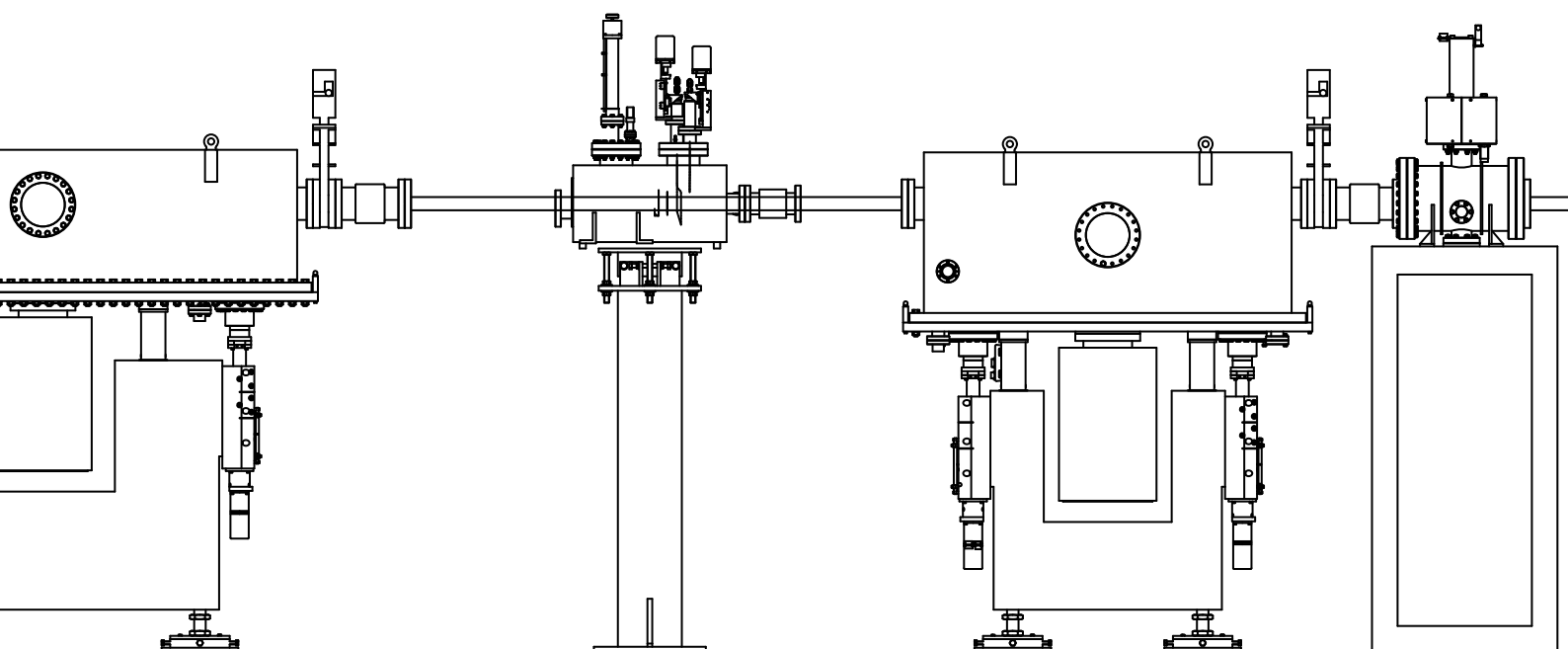
The Project Managers are a dedicated point of contact with the Customer and report project progress at key milestones and routinely through monthly project reports.



Materials Management

Materials management is under the control of a dedicated team who manage the procurement of materials in line with individual project requirements.

Requirements are scheduled so that items arrive on site 'just in time' for manufacture.





Factory

In March 2002 FMB Oxford moved into a new 1200m² factory in Oxford, fitted out specifically to suit our synchrotron beamline business. In 2005, following a strategic review, some activities were outsourced to supply partners and the factory layout was altered to provide maximised efficiency.

In Early 2010 an additional unit was acquired to add 600m².



UHV Cleaning

To achieve UHV vacuum specifications, FMB Oxford has a three stage ultrasonic cleaning plant.

The plant is based on an aqueous process using demineralised water in combination with other cleaning agents.

A steam cleaner operating with demineralised water is also available.



ISO Cleanroom

In 2014 FMB constructed and commissioned a new ISO7 cleanroom. Within the general area product can also be assembled to an ISO5 standard using laminar flow benches fitted with additional filtration. The facility is operated by a small team of specially trained technicians who work to strict cleanroom disciplines within the restricted access area.

The quality of product assembled in the cleanroom has been successfully validated by FMB customers. This has resulted in FMB winning significant new orders and plans are now in hand to add further cleanroom capacity during 2015.



Welding

FMB Oxford has full in-house capability for welding both in-air assemblies and in-vacuum assemblies.

Welding of in-vacuum assemblies is carried out inside our clean assembly area, which maintains UHV compatible levels of cleanliness and reduces final bake out times.



Clean Assembly

30% of the manufacturing area is taken up by clean assembly areas.

It is in these controlled areas that the final assembly and test of UHV products takes place.

Anyone entering the areas are required to comply with strict clean assembly practices.

In our optics cleanroom these practices include the wearing of cleanroom overshoes, coats, gloves and when handling optical components the addition of face masks.



Test Facilities

Mechanical testing is carried out in our clean assembly areas. Tests are designed to verify compliance on range, resolution and repeatability of mechanical translations.

Test equipment includes

- Zygo Interferometer
- Taylor Hobson Electronic Autocollimator
- Leica electronics level
- Metrology table in a temperature stabilised environment



Vacuum Test

Vacuum testing is carried out in our vacuum test area and a typical test program consists of helium leak testing and scanning for residual gases in combination with bake-out of the equipment.



Beamline Test

The flexible layout of our modern industrial unit allows us to set aside dedicated areas in which to assemble and test turn-key beamlines solutions.

These areas allow us to integrate key components in the beamline before the equipment is delivered. This is typically when the controls hardware and software are integrated with the beamline equipment.



Installation & Commissioning

FMB Oxford staff routinely carry out on-site installation and commissioning of complete beamlines, beamline systems and components. Our staff would typically undertake a 'cold' commissioning whereby the systems are installed, aligned and key performance specifications are reconfirmed without the use of the x-ray beam. The expected scope of 'cold' testing will typically have been agreed with the customer when the order is placed. FMB can also offer support for, or undertake, the 'hot' commissioning of complete beamline, or beamline system, with X-rays for our customers.



Design Office

It is FMB Oxford policy to invest continuously in state of the art IT systems and workstations. In conjunction with the latest 3D design software our Engineers have the tools to efficiently produce designs of simple systems or, with the aid of our catalogue of standard parts and assemblies, entire beamlines.



Visitors Centre

An area of office/meeting room space is available for visitors and training sessions.

Equipment/services available include:

- Digital projector and screen
- Internet access
- PCs
- Printing facilities



Technician Workspace

A dedicated area for Technicians or visitors to access the FMB Oxford IT systems - e.g. to check drawing status, purchase details, etc.

FMB Oxford operates an ISO9001:2008 Quality Management System that is certified by the British Standards Institute (BSI) and undergoes a programme of routine audit. The system is maintained internally by a full time Quality Coordinator and reviewed on a quarterly basis by the senior management team, led by the Managing Director.



Enquiry and Order

The handover from Sales to Operations is a critical stage in our business process and is managed as a formal process.

At a kick-off meeting the Project Leader is given a project folder containing relevant information generated during the sales process. This includes tender requests, technical proposals, customer correspondence, budget and pricing information, agreed dates and other relevant information.

The **Project Definition** requires the following documentation to be completed by the Project Leader and agreed with the customer:

- Quality Plan
- Functional Specification
- Project Program



Design

This phase requires the mechanical and electrical design to be completed and agreed with the customer.

After Final Design Approval the project goes into procurement. Long lead-time items will be ordered early but the bulk of parts will not be released prior to Final Design Acceptance.



Manufacturing

All manufacturing activity is controlled by works orders and all works orders have route cards.

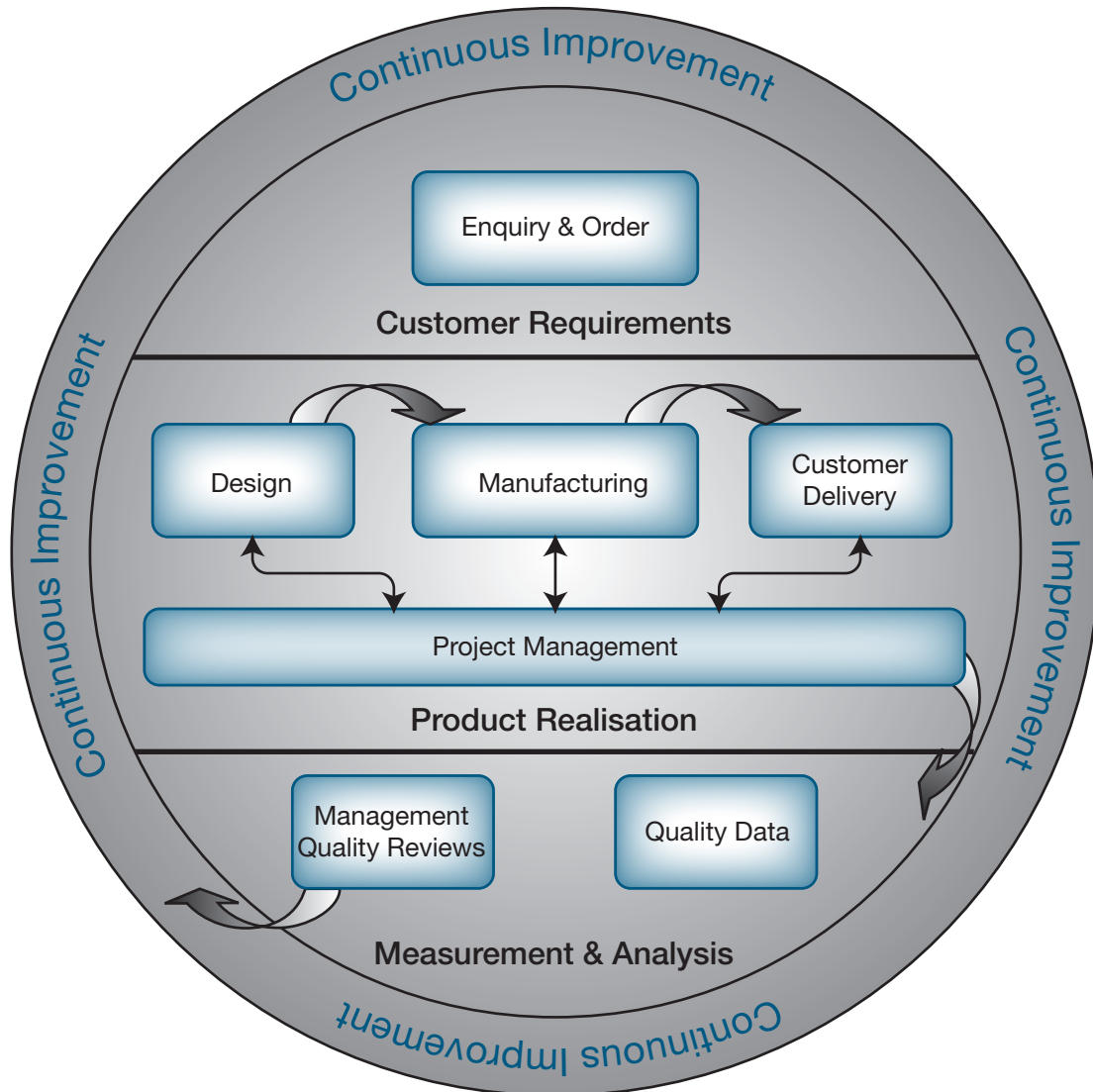
There is an individual route card for each component on the works order and this allows test information and serial numbers to be recorded for individual assemblies.



Delivery

FMB Oxford has extensive experience in shipping beamline components and systems to destinations worldwide. In conjunction with our shipping partners we have placed product in destinations on every continent and are familiar with local regulations and requirements.

The quality management system defines all of the key processes within the business and resides on the company's Intranet. The networked system provides hyperlinks to all the company's quality documents and allows FMB Oxford staff to quickly locate and access process information, procedures and supporting documents.



Our People are our Assets

FMB Oxford believes that our employees are our greatest asset.

Our ethos is to recruit the best people and allow them to take responsibility for their own actions.

FMB Oxford runs a Modern Apprentice Training Programme, which brings new technicians into the business through a formal and externally monitored process of training and development.

Continuous Improvement

In addition to maintaining its ISO9001:2008 accreditation systems the company also runs a programme of continuous improvement projects. These are implemented by multi-functional teams and responsibility for project progress is assigned to a team leader drawn from the pool of Engineers and Technicians. These projects are supported by training delivered through in-house workshops.



UK

FMB Oxford
Unit 1 Ferry Mills
Osney Mead
Oxford OX2 0ES
United Kingdom

Tel +44 (0)1865 320300
Fax +44 (0)1865 320301
sales@fmb-oxford.com

Germany

FMB Feinwerk-und Meßtechnik GmbH
Friedrich Wöhler Strasse 2
D - 12489 Berlin

Tel +49 (030) 67 77 30 - 0
Fax +49 (030) 67 77 30 - 40
info@fmb-berlin.de

USA/Canada

Toll Free (US) 1 800 673 7914
Fax 011 44 1865 320301
sales@fmb-oxford.com

Japan

Hakuto Co., Ltd.
1-13, Shinjuku 1-Chome
Shinjuku-Ku
Tokyo, 160-8910

Tel +81-3-3225-8938
Fax +81-3-3225-9011
fmb-oxford@hakuto.co.jp

Korea

Semivac Inc.
#704 Damoa Plaza,
1256-6 (Pyeongnae-Dong)
Gyeongchun-Ro
Namyangju-Si, Gyeonggi-Do,
Korea, 472-938

Tel +82 (0)31 591 3180
Fax +82 (0)31 591 3179
semivac@semivacinc.com

India

Transact India Corporation
5/1A, Grants Building
Arthur Bunder Road
Colaba
Mumbai 400 005

Tel +91 22 2285 5261
Fax +91 22 2285 2326
sales@transact.co.in

China

Clover Technology Group Inc.
No. 56A South Street Zhong Guan Cun
Fang Yuan Mansion
Suite B0201
Beijing 100044

Tel +86 10 8802 6700
Fax +86 10 8802 6856
zhy@nuclover.com

www.fmb-oxford.com