

3M Health Care Limited  
Clitheroe Site



# Leading in Inhalation Component Technology



The 3M site at Clitheroe, United Kingdom, plays a pivotal role in 3M's Drug Delivery Systems business, which provides world-class inhalation and transdermal drug delivery product development, component supply and manufacturing services to pharmaceutical and biotechnology companies. Successfully teaming 3M's delivery technology with molecules from partner companies has helped make 3M a global leader in inhalation drug delivery.

From pioneering the development of the first metered dose inhaler (MDI) for asthma sufferers in 1956 to the first breath-actuated MDI, 3M continuously innovates to benefit partner companies, health care professionals and patients alike.

Today, the MDI continues to be the most commonly used device for inhaled asthma medications and more than half of the MDIs manufactured worldwide utilise technology developed by 3M.



# Experience Matters

## Committed to Environmental Sustainability

3M was recognised by a Global Stratospheric Ozone Protection Award from the United States Environmental Protection Agency for the development of the first MDI to use non-ozone depleting hydrofluoroalkane propellants. The Clitheroe site pioneered the development of new generation valves designed for compatibility with the propellants.

## Clitheroe Site - Leading in Inhalation Component Technology

The Clitheroe site is 3M's global source of supply for the design, development, manufacture and assembly of valves and cans for MDIs. 3M Drug Delivery Systems is the only MDI component supplier to manufacture both valves and cans in-house, benefiting partner companies by ensuring component compatibility and the ability to individually or simultaneously optimise them into the supply chain.

MDI components are complex devices that begin life as coiled sheet metal – either aluminium alloys or austenitic stainless steel for superior corrosion resistance. Metals have many advantages for pharmaceutical component manufacturing as they have very low levels of leachables, no swell in contact with the formulation and have physical strength and robustness.

As well as manufacturing a full range of components, the Clitheroe site's expertise lies in fully customising components to suit the specific needs of an individual product. This enables 3M to help solve the formulation challenges of its commercial partners, allowing them to create greater product differentiation in a competitive market place.

Components developed at Clitheroe are available to pharmaceutical companies either on a stand-alone basis or as an integral part of 3M's drug delivery partnering programmes.

### Valves

Since its inception, the Clitheroe site has produced over 3 billion valves for MDIs to the exacting standards required by international regulatory authorities. 3M Drug Delivery Systems is the only valve manufacturer that integrates in-house metal component manufacturing with valve assembly on-site.

The 3M™ Retention Valve has been developed to provide good 'prime' retention over seven days, resulting in low loss of dose and excellent dose uniformity for the patient. The all-metal valve system has clean EPDM (Ethylene Propylene Diene terpolymer) elastomer seals to provide low moisture ingress and leakage, and can be utilised across a range of MDI products.

### Cans

Based on its deep drawing expertise in metal components, the Clitheroe site develops and manufactures a wide range of cans – plain, coated and sleeved aluminium, together with low volume cans and mini-units containing 10 or fewer doses.

Coated Cans can improve the chemical and physical stability of MDIs by reducing drug deposition on the internal walls of the can and inhibiting degradation of the formulation. The recently developed FEP (fluorinated ethylene propylene) Coated Can ensures that 3M can meet the challenges posed by today's more complex respiratory drug formulations.



## Site Operations

### Process Technology Centre

The Process Technology Centre forms part of the division's Research and Development organisation, and leads the development of new MDI components and technologies, either as self-funded projects or those specific to individual customers. The group employs a mix of graduate scientists and technologists in areas such as materials science, chemistry and pharmacy, together with highly skilled technicians and toolmakers. Among the centre's core competencies are 'bench top' valve assembly under clean room conditions, full valve performance testing and CAD/3 dimensional modelling.

### Component Manufacturing Facility

High precision engineering and cold metal deep drawing are performed in the Component Manufacturing Facility, which is staffed by time served toolmakers and press & machine operators. Supported by production engineers and technical specialists, the facility has a fully equipped toolroom with CNC lathes, grinders and millers, transfer and tool presses and metrology systems.

Elastomer extraction and component cleaning using automatic degreasing and washing systems are also performed, before components are transferred to the Valve Assembly module and cans are sent directly to the customer.

### Valve Assembly

The Valve Assembly module has up to five separate fully automated assembly processes with bespoke indexing, pick 'n place or continuous motion equipment operating at speeds up to 500 parts per minute. Sophisticated sensors and vision systems ensure correct component assembly and equipment is positioned into Lean manufacturing cells to improve flow, increase productivity and reduce cycle time. All staff in the module are trained in Good Manufacturing Practice and many are trained as Lean Six Sigma project leaders to support continuous improvement programmes.

### Quality

The Quality group comprises three distinct functions: *Quality Assurance*, which includes quality improvements, site compliance to Good Manufacturing Practice standards and final product release to customers, *Quality Control*, responsible for the testing and internal release of all components, sub-assemblies and finished product and *Analytical Support*, which provides analytical testing services to the Quality Control group and wider business. The engineers, chemists and technicians in the group have a breadth and depth of experience in operating to the stringent quality standards mandated by the global pharmaceutical industry.

### Manufacturing Technology

Engineers in the Manufacturing Technology group are tasked with enhancing service to the customer through improvements to product quality, compliance levels and responsiveness in the manufacturing, product development, quality testing and logistics areas. The group drives the continuous improvement of product capabilities using Lean Six Sigma methodology and is actively involved in

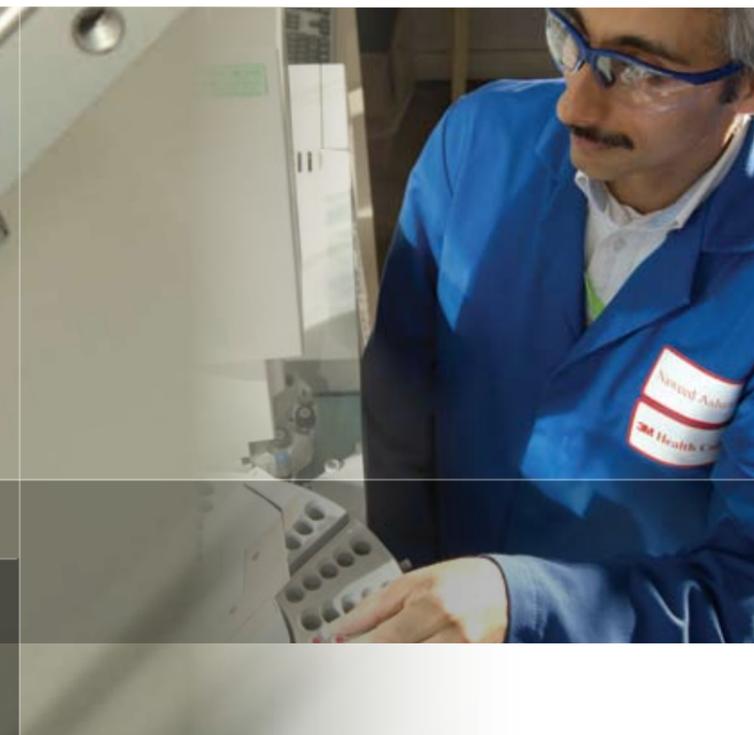
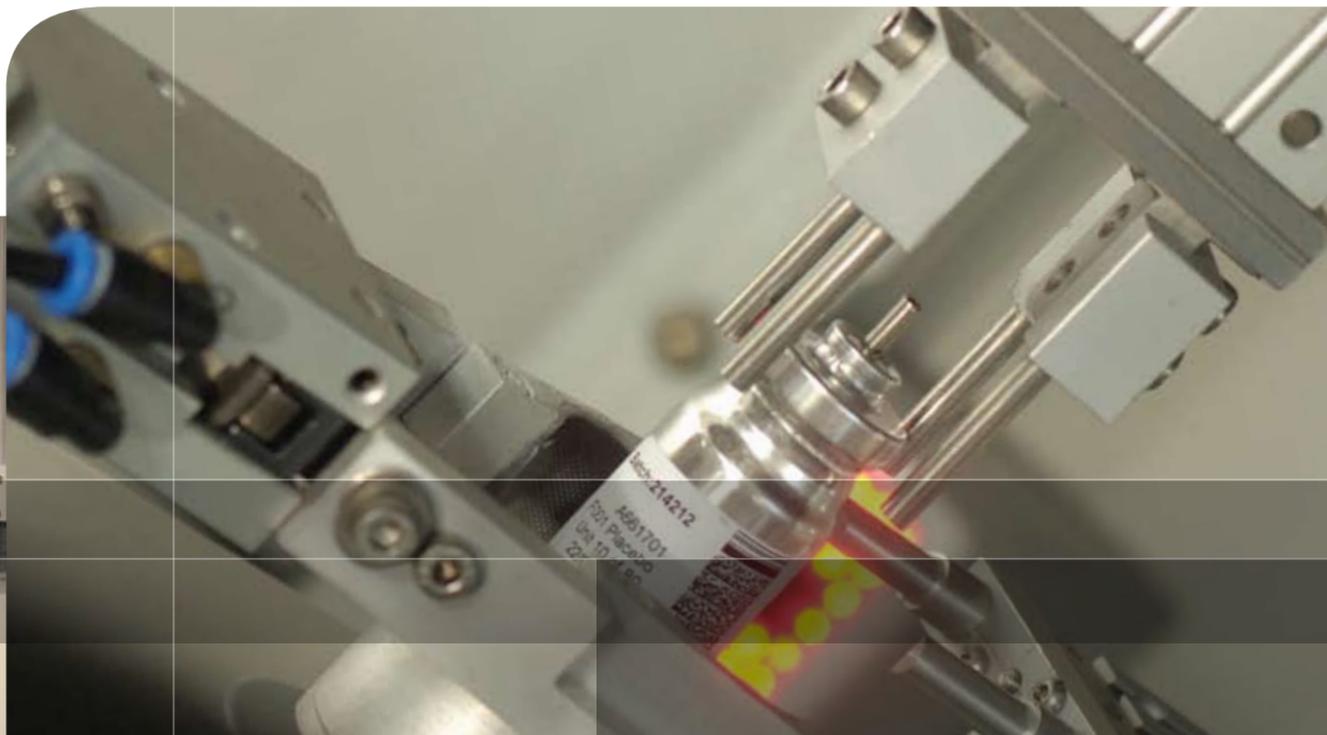
liaising with customers to better understand their needs and service requirements. Implementation of improvements to the site's manufacturing capability is led by the group, with the introduction of new technology in high speed manufacturing and assembly equipment.

### Committed To Operational Excellence

The Clitheroe site is registered with the British Standards Institute to the Quality Management Systems Standard ISO 9001, the Environmental Management Systems Standard ISO 14001 and the Occupational Health and Safety Standard OHSAS 18001. The site has been awarded the Royal Society for the Prevention of Accidents Gold Award for six consecutive years.

### Pollution Prevention Pays

3M recycles all stainless steel and aluminium waste at its Clitheroe site as part of its global commitment to preventing pollution at source.



## Outstanding Career Development - Locally and Globally

For more than 100 years, 3M has created innovative technologies and products that meet real customer needs by bringing out the best in its employees. Working for 3M at Clitheroe is an exciting way to start or continue a career in the drug delivery industry. Each year the site recruits into a number of functions, with opportunities for graduates and individuals with specialist manufacturing, toolmaking, technical and business support experience.

Current vacancies at Clitheroe are advertised on the 3M Careers website at [www.3m.com/uk/careers](http://www.3m.com/uk/careers), and in local newspapers and specialist technical journals. The site also operates a successful Engineering Apprenticeship programme in partnership with the BAE Training School in Preston. Apprentices combine theoretical and practical training phased over a three year period at college and on-site, leading to qualified engineer status in their selected specialty.

3M invests in training and development for all employees within the organisation to enable individuals to fulfil their potential. Graduates are encouraged and supported to take relevant professional qualifications and all employees have a Personal Development Plan supported by regular performance reviews. Whilst the Clitheroe site alone offers a breadth of development possibilities, working for

3M provides the opportunity to progress on a global scale, within a diversified technology company hailed as the third most innovative in the world.\*

\*Source: Business Week 2006

### Career Profiles

#### Howard Bleazard, Valve Assembly Module Manager

"I joined the Clitheroe site in 1984 and over my 24 years service, I've benefited personally and professionally from experiencing a wide variety of roles. After a degree in Civil & Structural Engineering at Sheffield University, I started in the development laboratories, progressing through more senior Research & Development roles to become a member of the management team as Site Technical Manager. This important position was responsible for managing the successful resolution of customer technical queries for valves and cans.

In 2001, my focus changed to manufacturing and I progressed to become Manufacturing Technology Manager in 2003. Intensive training as a Six Sigma 'Black Belt' enabled me to coach employees across the site in the practical implementation of Six Sigma continuous improvement programmes. I've been in my current role of Valve Assembly Module Manager for nearly three years now. It's a highly complex manufacturing module, with up to five separate automated assembly processes, operating at speeds up to 500 parts per minute. It's a challenging environment which needs to be flexible and adaptable to meet changing business needs.

Throughout my career, 3M has supported my development and I've gained the Diploma in Management Studies which has been invaluable in my present role. Outside of work, I've recently trained as a magistrate. The company allows me to take additional paid

leave to fulfil my responsibilities, and this new challenge has given me a fascinating insight into the community where I live and work."

#### Dr Victoria Velasco, Development Specialist

"In 1997, I moved from my native Spain to England to work as a Research Assistant at Liverpool John Moores University on a two-year post-doctoral programme. On its completion, I joined 3M at Clitheroe as an Advanced Scientist in the Process Technology Centre and have since progressed my career to the level of Development Specialist.

My role involves the technical side of MDI component development: running design experiments to assess different valve designs, statistical analysis and project managing the development. It's an exciting place to work as it's the future of the business! The most interesting part for me is the opportunity to interact with a wide range of people, including colleagues from other 3M sites and customers in the UK, Italy and Japan. I really enjoy learning about what other people do and, in the case of customers, understanding their requirements. My job brings a really interesting mix of building relationships and tackling technical and timeline challenges.

3M has provided me with the opportunity to work on challenging projects to stretch my skills, supported by internal and external training. The company has a great work-life balance policy including flexible working hours and this has allowed me to continue to progress my career at the same time as enjoying my young family."

#### Ian Dandy, Toolroom Coordinator

"After an engineering apprenticeship and a varied manufacturing career including 15 years as a multi-skilled machinist in a glass factory manufacturing TV screens, I joined the 3M site at Clitheroe in 1991. I was attracted to the company by its excellent prospects for the future and positive feedback from existing employees, both of which have lived up to expectations.

I'm responsible for the deep drawn metal component manufacturing facility, which is supported by the Toolroom, Wash Bay, Degrease Extraction and Maintenance departments. Ensuring process compliance is a critical aspect of the role, in order to deliver a quality product that gives the patient the reliable performance they expect.

I'm currently on a six month assignment as a Shift Supervisor, responsible for ensuring that all people on shift know what is expected of them and leading and motivating their performance to meet our challenging production targets. We have a strong teamwork ethic across the department, and this makes for a satisfying and rewarding working day."



The 3M site is located on the outskirts of Clitheroe, Lancashire, a historic and prosperous market town in the Ribble Valley with a population of around 14,600. Dominated by a Norman castle, Clitheroe offers a diversity of specialist shops, excellent schooling and one of the lowest levels of unemployment in the country. The town is surrounded by unspoilt countryside including the Forest of Bowland, designated an 'Area of Outstanding Natural Beauty', and provides a high quality of life for those living and working in the area.

Easily accessible from the M6 and M65 motorways, the 3M site is serviced by train from Manchester to Clitheroe Station, approximately 5 minutes away by car. Manchester Airport is a 75 minute journey and Leeds Bradford Airport 60 minutes by car.



## Community Counts

Supporting the local community is something that the Clitheroe site is proud of. Those with science and engineering backgrounds help foster an early childhood interest in the subjects by working as 'Science & Engineering Ambassadors' with local schools. The site supports 3M's national child road safety programme '3M Streetwise' through activities linked to National Road Safety Week, of which 3M is a corporate sponsor. 3M has donated reflective vests and accessories to pupils at many primary schools in the Clitheroe area, helping them to be more visible when walking and cycling on our roads. The company has also developed a free web-based educational tool, [www.3MStreetwise.co.uk](http://www.3MStreetwise.co.uk) to help schools to teach road safety messages in an entertaining and thought-provoking way.

## Learn More

If you would like further information on our Clitheroe operations, please contact the Administration department on 01200 422251.



# Prosperous Location



**3M Health Care Limited**

Upbrooks  
Clitheroe  
Lancashire  
BB7 1NX

Tel: 01200 422251  
Fax: 01200 428993  
[www.3M.com/DDS](http://www.3M.com/DDS)

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