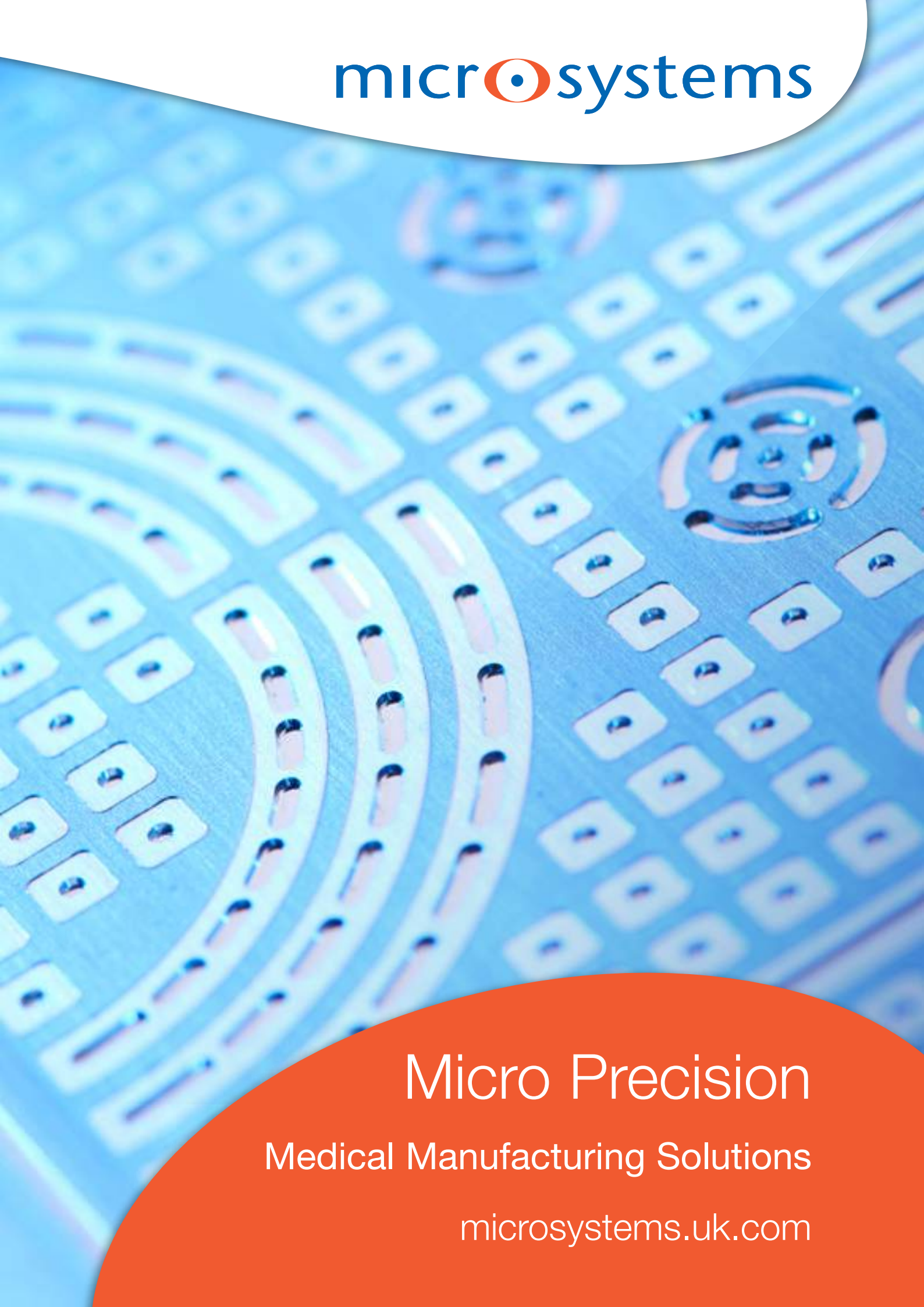
microsystems



# Micro Precision

## Medical Manufacturing Solutions

microsystems.uk.com

microsystems



# Micro Precision

**Medical Manufacturing Solutions**

microsystems.uk.com





These Injection moulded components showcase Microsystems manufacturing capabilities, from large scale to micro size



# Micro Moulding Specialists

## Pilot to full production mould validation

Typical component sizes range from 0.0003 up to 2.5 grams with micro and even nano scale features

Microsystems is forward thinking and making advances in micro and nano manufacturing processes

*We utilise many **ground breaking techniques** to solve complex micro-manufacturing problems and significant progress is being made as we move from **micro to nano manufacturing**.*



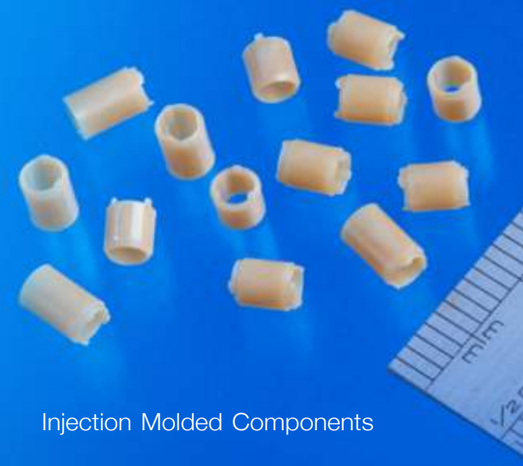
# Micro Moulding

## Microsystems Micro Moulding Class ISO 7 Production Facility

One of the cornerstones of our business model has been the development and use of micro and nanotechnologies in the design and manufacture of injection moulded components for the micro medical industry.

Microsystems has many years of experience in micro-moulding, from proof of principle pilot mould feasibility studies to full production mould validation and component supply. We have a dedicated micro moulding facility, ISO13485 accredited, for all mould testing and manufacturing processes.

Each micro-moulding production cell has a robot handing system for either component separation or tray packaging via an in-line camera vision system for 'component' integrity and quality control prior to packing.



Injection Molded Components

# Mould Design

## Mould design and simulation

The Microsystems Design Office is equipped with the latest software available in the market, ‘Siemens NX’. This powerful, flexible, and innovative product development solution for CAD systems is used by our design team to great effect.

The Microsystems design team are regularly approached to undertake technically challenging projects. Some of these projects involve specialist steel selections for optical surfaces, micro machining and fast high-temperature heat transfer, localised to optimise specific micro features. For example, the use of powder metallurgy steels to optimise mould cooling.

The Microsystems design team is always willing to take on technically challenging projects

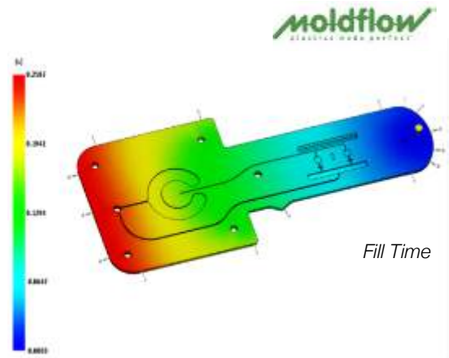


## Product development and manufacture of injection moulds

Microsystems specialises in the design, manufacture and validation of ultra-precision injection moulds for the medical, pharmaceutical and optical markets.

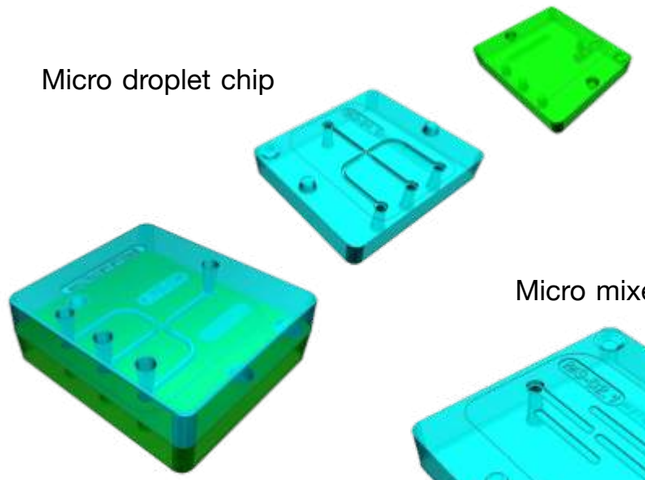
Our Injection mould tooling ranges from single cavity pilot test moulds to multi-cavity moulds for high volume production.

Microsystems is always willing to work closely with each customer to turn their development ideas into reality, a finished product, ready for the market.




Blood Platform
Venting Analysis

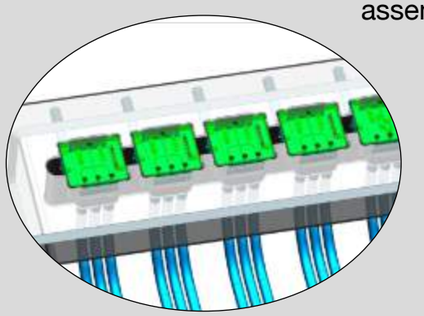
Micro droplet chip



Micro mixer chip



Micro fluidic holder assembly



# Clean Manufacturing

At Microsystems, all manufacturing processes at are carried out in a clean, temperature controlled environment.





*Microsystems was the first in the UK to take delivery of this latest generation WEDM machine.*

With this machine we can cut through hardened steel with a wire diameter of 30 microns (0.0013”) and a positional accuracy of 0.001mm (0.00004”).

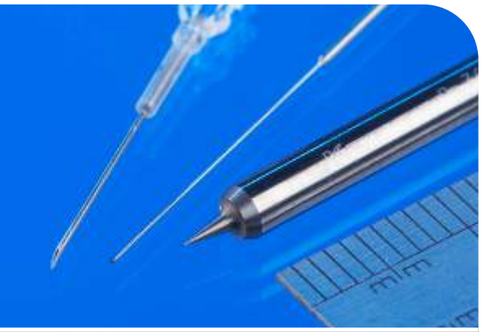
## Mould Testing

### Complete Turnkey Package

Microsystems mould testing facility is separate to our mould tool manufacturing which allows our customers complete confidentiality for factory acceptance testing (FAT), design of experiments (DOE) process optimisation and ease for component steel safe adjustments if required. We accommodate customers machines offering a complete turnkey package.

Microsystems has a dedicated ***product testing facility***, a clean room where machines are set up to run tests to suit a customer’s specific requirements.

# Machining Capabilities



## Micro Machining

Microsystems' micro machining capabilities are probably unique, with the latest generation machines for micro milling, micro grinding, micro EDM and wire EDM in temperature controlled clean facilities. We can machine parts with the smallest features that you can imagine.

## Optical Inserts

In addition to micro machining, Microsystems can supply optical inserts for conventional and micro moulds. In certain applications, it is possible to supply hardened stainless mould steel inserts, directly machined, without the need to carry out any manual polishing operations.

## Conformal Cooling

Microsystems utilises additive manufacturing processes to manufacture inserts with cooling circuits that were previously impossible to produce with conventional machining techniques.

### Metal Core with Conformal Cooling

Large Syringe core split to reveal the intricate cooling design mechanism



# Micro Optics

## Polymer Optics

This is perhaps the most challenging area of our business. Microsystems provides solutions for consumer and implantable lens technology with demanding tolerances.

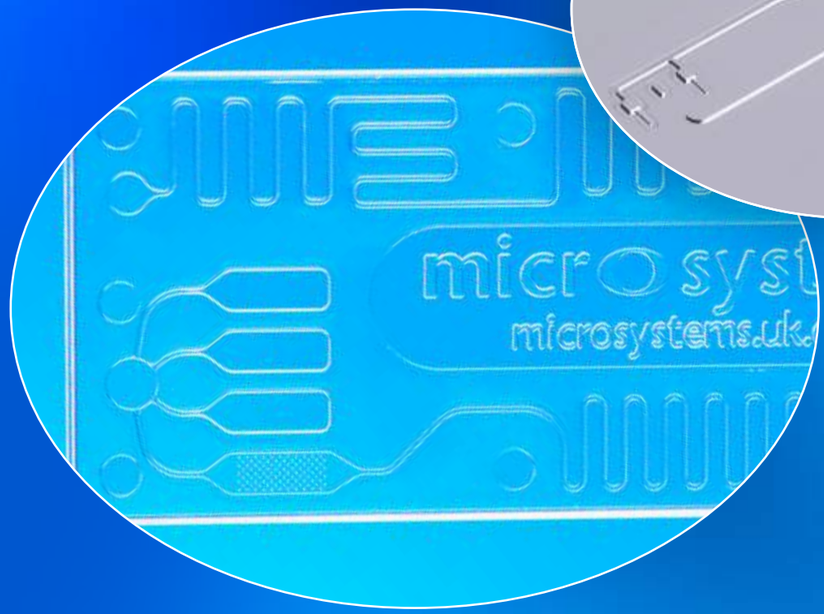
# Micro Fluidics

## Manufacture of Microfluidic Moulds

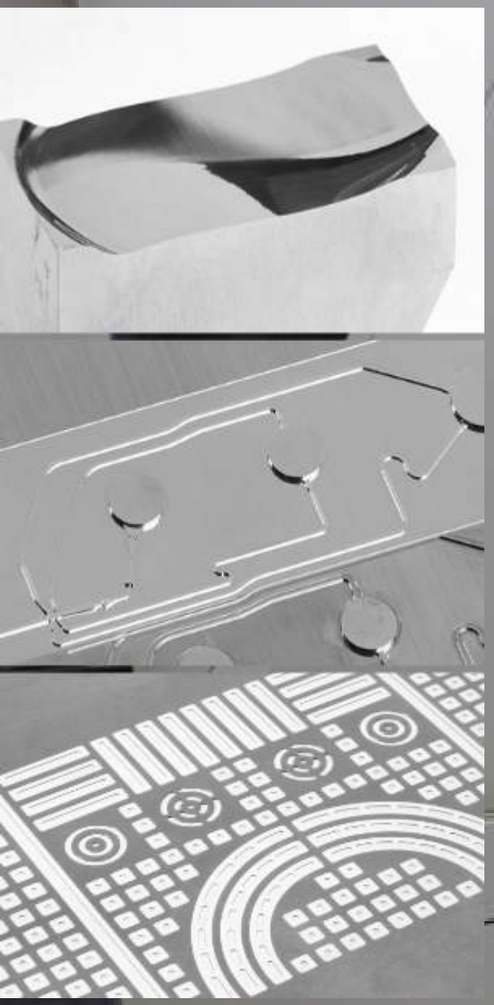
Microsystems has extensive experience in the manufacture of microfluidic moulds with tolerances as low as +/- 0.001, with integrated optics.

Microsystems provides solutions for Microfluidic blood analysis products. These often having integrated optical imaging, achieving surface finishes from 20 – 30 nm.

Our micro machining capabilities offer new possibilities in the advancing microfluidic applications in the real world.



# Micro Milling



Micro machined components

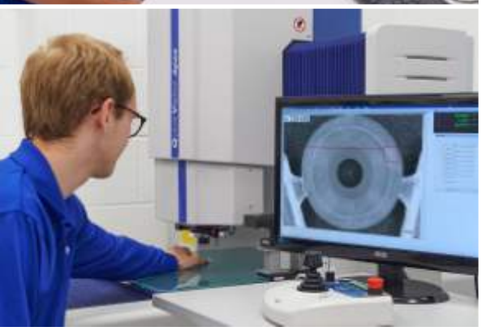
# KERN Pyramid Nano

## 5-Axis Micro Milling

The positional accuracy of the ultra precision 5-axis micro Kern milling machine is 0.0005 mm (0.00002”).

With a spindle speed of 55000 RPM, it is possible to machine fully hardened steel using cutters as small as 50 microns in diameter (0.002”).

# Quality Assurance



## Quality Control in Manufacturing

Quality is in our DNA and is the reason we continue to invest in the latest technology available in Metrology.

*Our in house metrology includes:*

- Several CMM Vision and Probe Systems that can deliver tolerances of 1µm.
- GOM Software for 3D Measurement Data – Used for shape and dimension analysis, 3D inspection and mesh processing for 3D point cloud and CAD data sets. High precision of the software is certified by the 'Physikalisch-Technische Bundesanstalt (PTB)' Institution and the 'National Institute of Standards and Technology (NIST)' by comparison with reference results. The GOM software was classified in the category with the smallest measurement deviations (Class 1).
- Digital Microscopes capable of scanning 3D data with a maximum resolution of 10 nanometres.
- An Interferometer to scan 3D data with a maximum resolution of 0.2 manometers.
- CTScan Computed Tomography – One scan – full certainty: Measure, analyse, inspect hidden defects and inner structures that cannot be detected with coordinate measuring machines.

# Metrology

## Scanning and prediction of final part quality

Microsystems is able to complete projects on time by focusing on key tasks. The process for the development and interrogation of many products is enhanced by our ability in scanning and prediction of final part quality. The ***clear benefits of our use of metrology*** is shorter project lead-times, faster turnaround on design enhancements and lower supplier costs.

*'Great things are done by a series of small things brought together'*

Vincent Van Gogh



# Microsystems Singapore



## Servicing businesses in South East Asia

Located at MedTech Hub, Singapore, this facility has a dual purpose. It enables us to service customers operating in South East Asia, and it also acts as a mirror to our UK mould design, mould testing and manufacturing facility. This allows us to transfer production between the sites if circumstances dictate, as we have duplicated the key software and machinery to match that which is used in our UK manufacturing site.


# Production Moulding Facility

## Mould Validation, Clean Production

With our ***Optimold Production Moulding Facility***, we are able to provide mould testing and validation. We are able to offer various production options, including 'two material' moulding. These can be supplied in any quantity, from a few thousand to many millions.




'Production of ***any quantity*** of parts and components, from a few thousand to many millions'

## Quality Management, Metrology

The site operates a **QA system with ISO 13485** accreditation. Testing for quality and conformity is carried out using the latest technology available in Metrology. Low to medium volume component manufacture is ideal for pre-production testing, clinical trials and market acceptance of medical device parts and components.


*Production Moulding Website:*
optimold.uk.com

optimold

# Micro Precision

## Medical Manufacturing Solutions

microsystems.uk.com



**Micro Systems (UK) Limited**

101 Golborne Enterprise Park
Golborne, Warrington, WA3 3GR
United Kingdom

T + 44 (0) 1942 290 960
E info@microsystems.uk.com

**Micro Systems (UK) Limited**

Calle Ruiz Belvis #2,
Edificio David Questel, Suite A
Santa Isabel, PR 00757, Puerto Rico

M + 1 787 209 7758
E puertorico@microsystems.uk.com

**Micro Systems Engineering Solutions Pte Ltd**

MedTech Hub, 2 Tukang Innovation Grove
#05-02, Singapore 61830 5

T + 65 97 94 47 00
E singapore@microsystems.uk.com

**Quality Assurance Management System Accreditation**

**ISO 9001: 2008**
Certificate Number
LRQ 4005921/A

**ISO 13485: 2003**
Certificate Number
LRQ 4005921/B

Produced by Orangebox Digital orangebox.co.uk Photography Jonathan Lynch

microsystems