

# ULTRA-PRECISION AEROSTATIC MILLING MACHINES



## Ultraprecision Milling Machines of the MMC Series

The ultraprecision milling machines (UP milling machines) of the MMC series (Micro Milling Center) are the result of our 30 years of experience and are specifically designed for fly-cutting operations.

### Highest Precision and Versatility

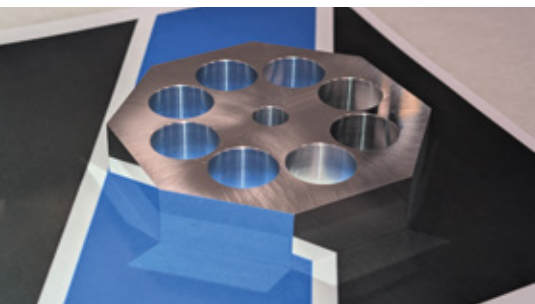
Using diamond tools, optical surfaces can be produced with the highest form and geometry requirements in non-ferrous metals such as brass, copper, aluminum, nickel-phosphorus (electroless nickel), as well as plastics.

Form tolerances of  $< 0.1 \mu\text{m}$  and surface roughness values typically between 2–4 nm (Sa) are achievable for components with dimensions of up to nearly 1 meter. In addition to flat surfaces, depending on the configuration, microstructures, polygons, or rotational paraboloids can also be manufactured.

### Proven Across Numerous Industries

Our systems are already successfully used in the following sectors:

- Optics and Laser Technology
- Semiconductor Industry
- Tool and Mold Making, Automotive
- Fundamental Research
- Aerospace
- Luxury Goods (Watches, Jewelry)



Milled 8-surface polygon



### Unique Design

Our machines are characterized by the following features:

- Natural granite base
- Aerostatic bearings
- Ultra-high-resolution measuring systems
- Aerostatic milling spindles
- PLC with highest computational accuracy
- X/Y axes on the workpiece side
- Z-axis on the portal

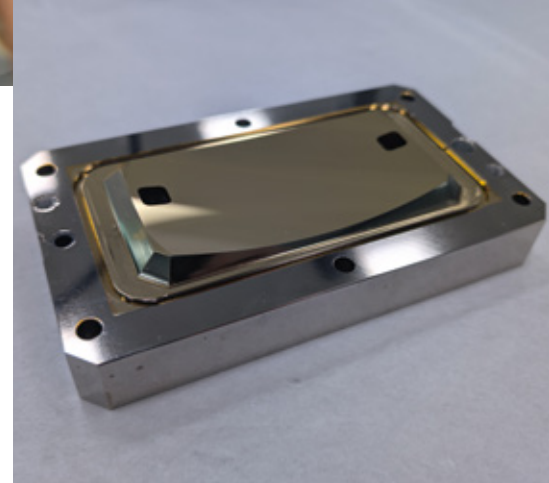
If your requirements go beyond our standard machines, we are happy to develop customized solutions for you.

### Base Models: MMC600 to MMC5000

The MMC600 and MMC900 models differ primarily in the length of the main axis. The MMC900 allows for the machining of larger components and offers additional options such as:

- Integrated Fizeau interferometer
- Additional Z-axis for measurement tasks

As the largest UP machine ever built, the MMC5000 offers an X-travel of 5 meters and space for “many” workstations.



Milled sphere

### Extensive Accessory Options

Our wide range of accessory options helps you achieve the best possible results:

- Minimum quantity lubrication
- Sectional door for higher throughput with maximum personnel safety
- Various WST measurement techniques
- C-axis, Y-axis
- Spindle tilting device
- Polygon device
- Various milling heads (1 to 12 tools)
- Various vibration isolation systems
- Cameras

These are just some of the most commonly used options. Contact us and our experts will work with you to create the perfect package for your production portfolio.

