

# Implementing IN

With its new fine machining center in Mainz, Schott intends to develop and install technologies for the production of prototypes.

The temperature gauge lights up: the display shows 20°C. The room is fully air-conditioned and can be regulated to 0.1 Kelvin. In the middle of the climatic chamber stands a five axis machining center, a 14-tonne colossus and heart of the new facility. It has been modified to allow the

installation of flexible spindles. Thanks to ultramodern grinding techniques it is possible to achieve higher rates of material removal, improved component qualities and finer structures. High precision three-dimensional shapes can be ground with this machine. Such structures with complex geometries and at the same time maximum accuracy requirements are in fact called for by the market.

## Striving for extra added value

The fine machining center provides Schott's manufacturing divisions and subsidiaries with facilities for such processes as grinding and drilling, fine grinding with lapping kinematics and dicing. The department responsible for processing technology in the Research and Technology Development Division hopes to make a contribution to the manufacture of components with increased quality specifications, to improve the economic effectiveness of treatment processes and to achieve extra added value in existing production processes. The service center will, however, also assist in the generation of new businesses and new products, i.e. the manufacture of new Schott products and new products in general. "It is our goal to obtain faster

conversion of innovations into actual products in the future", said center manager, Dr. Sabine Lehnicke.

The center has been set up near the optical glass production to make the technologies for prototype production available in an area where the greater part of added value is created through treatment by machining. Quite often very complex geometries have to be produced from "Zerodur" in short runs and variable sizes. Further the location allows easy internal knowledge transfer.

## Improved surface quality

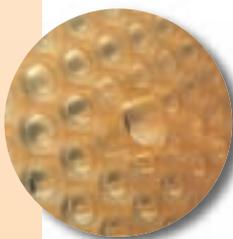
In addition to the five axis machining center, the unit has another machine at its disposal: a wafer saw working with a dicing disk and a high frequency spindle rotating at 80,000 rpm. This CNC (computerized numerical control) four axis machine is also fitted with a turntable and can grind components up to a size of 200 x 200 x 3 millimeters. For the fine grinding of flat surfaces, a single sided lapping machine is being added to the center. This can be fitted with a pellet tool. This procedure allows improved surface qualities compared to kinematically related lapping with considerably higher removal rates. In addition to the treatment of complex components and the manufacture of prototypes, the fine machining center will also be used for technology development. In the past, development opportunities have largely been restricted to new grinding processes or testing new grinding tools. For the future, a further extension is being planned so that a considerable part of the secondary processing technologies relevant to Schott will be available in the fine machining center ■

### WIDE APPLICATIONS SPECTRUM

Process and technology optimization is one of the focuses of the fine machining center, as well as the expansion and improvement of potential applications of existing materials and products.

Examples of applications are:

- Astronomy: introduction of complex lightweight structures in "Zerodur" mirror carriers and as a result further weight reduction for telescopes
- Sensorics: "Zerodur" housings for transportable metal analyzers (currently in testing phase)
- Microlithography: "Zerodur" as a precision component for positioning systems (reticle/wafer stages) in wafersteppers
- Measurement: glass ceramic components (including deep hole drilling if required) for high accuracy length/angle measurement e.g. in laser gyroscopes in aeronautics and space travel
- Optoelectronics: mini glass disks for windows in light-emitting-diodes (LED)
- Household appliances: edge treatment of flat glass components.



Less weight with same function: "Zerodur" mirror carriers with honeycomb structure.



The heart of the new service center is a five axis machining unit.

# NOVATION *Faster*



*Clamping a "Zerodur" block.*

*Complex high precision structures can be achieved with ultramodern technology.*

