

With the heating system running at a higher rate, hot temperatures can be achieved both more quickly and very evenly throughout the enclosure's interior, and measurement cycle times can be reduced. Hot Box enclosures will also support purging if required.

In this way, Intertec can make hot boxes capable of providing certified hazardous area electric heating for

temperatures up to 150°C/300°F in small footprints, complete with doors for simple maintenance and operator access. These highly insulated GRP hot boxes can be designed to be completely weather resistant, allowing large savings to be made in the installation and ownership costs of process analyzers.

Another major possibility of Intertec's GRP-based hot boxes is

shape optimization. The construction techniques used for GRP make it simple to create special shapes - further simplifying online analyzer and sampling applications located close to the process.

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Spherical parts in shortest possible cycle times

Thielenhaus Microfinish has developed an innovative machine solution SpheroStar, which has the capability to machine spherical workpieces in short cycle times with great precision

Based on the high-precision Sphero machine tool, Thielenhaus Microfinish has now developed a highly efficient two-step solution which performs the entire fine-finishing process for spherical workpieces in short cycle times. The new SpheroStar also builds upon the MicroStar and NanoStar platforms constructively and like these two it is equipped with an indexing table.

The SpheroStar has two tool spindle units that can automatically rotate by up to 90 degrees so that the optimal machining position for the relevant process is always selected, thus enabling the production of flat surfaces as well – with optional cross slides – instead of only spherical surfaces. The units are mounted vertically and are easily accessible for fast changeover. The machine is loaded at the first station by a handling robot in a cycle-time-neutral manner and is later again unloaded after machining. The indexing table then moves to station 2 where the workpiece is aligned axially. Pre-finishing takes place in-process in



The new SpheroStar by Thielenhaus Microfinish makes it possible to machine spherical workpieces in short cycle times efficiently and with great precision.

station 3 under size-controlled conditions, and the end-finishing with a flexible stone is done in station 4. This operation too is IPM-monitored. A MicroSens force sensor is

used for both work steps with workpiece contact detection and brick wear compensation.

The clamped workpiece rotates at up to 4,500 revolutions per minute



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during machining. The spherical surfaces are created in a reliable manner in terms of process in connection with a corresponding contour of the Microfinish tools. Depending on pre-machining, the cycle time is only 12 to 13 seconds, so that the machine can be properly integrated into efficient production lines.

Since the most important assemblies are from approved platforms that have already been on the market for long, the new machine also features a high level of failure safety. This means that the indexing table comes from Nano-Star, the spindle unit from Sphero and the lining together with the tensioning system are from MicroStar.

This new SpheroStar enables machining of surface topography, spherical roundness, spherical di-

ameter and sealing surfaces. Plus the improvement in supporting components enables tribological requirements to be fulfilled. In just a few installation steps the machine can be converted from outer machining to inner machining, i.e. from a sphere to a sealing ring or a socket. Since the workpiece remains in the clamp until it is completely finished, the operator influence is reduced and errors due to repeated clamping are ruled out. This increases process repeatability considerably.

Workpieces can be machined up to a diameter of 75 mm on the ergonomically designed machine. It is typically used in the automotive industry for machining the joint heads of wheel suspension and steering components that require a high level of freedom and movement for the associated assembly units.

Metallurgically-sealing valve balls and seating rings for valves in the chemical industry, through which aggressive or very hot media travel, are able to be machined with a high degree of dimensional and surface accuracy. Another instance are the axial piston pumps found in all fields of hydraulics. The axial piston has a spherical sliding surface at the end, and the dimensions of this component must be accurate to 1 µm or less in order to guarantee safe operation at great strain – such as in aviation.

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