

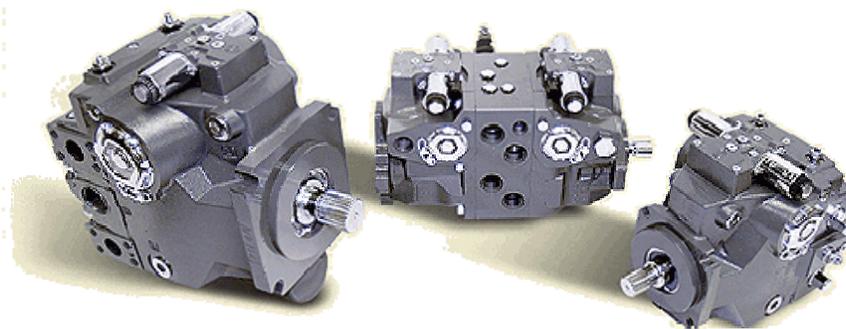
# Leading Hydraulic Equipment Manufacturer Leverages Inspection System to Minimize Scrap & Rework and Increase Yield



Corning Tropel  
Metrology Instruments

Sauer Danfoss is a technology leader and global supplier of highly engineered hydraulic and electronic components and systems for mobile, off-road equipment including construction and agricultural vehicles. One of their primary product lines, axial piston pumps, is manufactured in their Neumunster, Germany facility. These pumps are critical to the operation of a hydrostatic transmission and must be designed and manufactured to provide reliable operation in a compact, quiet and powerful package.

To meet these requirements, Sauer-Danfoss' H1 axial piston pumps are designed with many intricate components that must be manufactured with tight tolerances for both dimension and flatness. Valve swashplates, mounting shoes and cradles, piston slippers, among others are manufactured to tolerances as tight as 2 microns.



Historically, engineers have used optical reference glasses (optical flats) or coordinate measurement machines to measure flatness. But as hydraulic pump technology advanced, so too did the need for improved measurement capabilities. Mr. Heinz Leschke, Sauer Danfoss' Manager of Production Service explained, "Higher system operating pressures and more complex pump designs dictated the need for tighter flatness specifications on individual parts and overall assemblies. A more accurate

system with higher resolution and repeatability needed to be implemented.” In addition, as production volume increased, faster measurement time, comprehensive data collection and analysis became more important and had to integrate within an overall statistical process control environment. That is when Sauer-Danfoss standardized on the Tropel FlatMaster 200XR to meet their increasingly demanding metrology requirements.

Developed by the Corning Tropel Corporation, the Tropel FlatMaster is a non-contact optical-based measurement system. It has the ability to measure the entire profile of precision component surfaces up to 200 mm, capturing hundreds of thousands of data points in seconds. The system offers up to 5 nm resolution and a standard accuracy of 50 nm, measuring flatness, line profile, surface profile, spherical radius and other surface parameters. It can measure a wide range of surface finishes including ground, lapped, honed, polished and super-finished as well as a variety of materials including metals, ceramics, polymers and glass.



*The FlatMaster series offers the capability to measure parts that range in size from 5-200 mm. Each system comes with an interferometer (two versions shown here) and a Window PC with Corning Tropel TMS software.*

According to Mr. Heinz, “The system is very user-friendly, and operation started immediately after installation and training.” Furthermore, he commented “upon integrating the FlatMaster, we have fewer quality defects, less rework and less scrapped parts, directly improving our overall quality.” As a result of their success with Tropel’s FlatMaster, Sauer-Danfoss has installed multiple systems throughout their global manufacturing network.



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