Case Study ACTech®

Staying Ahead – Right from the Start

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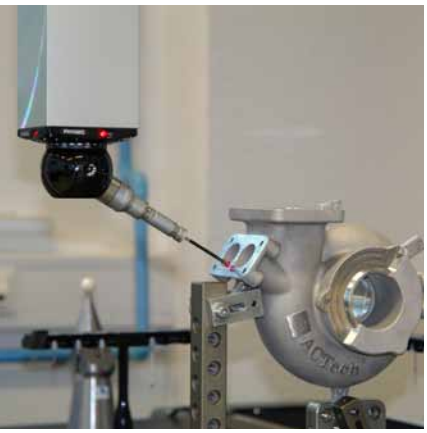
HEXAGON METROLOGY

For years now, dimensional accuracy of castings and their material properties have to fulfil ever-increasing requirements in the fields of automotive, aerospace and systems engineering. Despite that, measurement and inspection are in part still viewed like a possible bottleneck on production or an additional expense factor. At ACTech GmbH, leading developer and manufacturer of casting prototypes, based in Freiberg, Saxony, the contrary is true. Metrology here is a major value-adding resource to save time and money, and at the same time to significantly increase the quality of the more and more complex castings.



The core competence of ACTech GmbH lies in the rapid production of highly complex casting prototypes, close to series production intent, in a small quantity. Their areas of expertise include general mechanical engineering, hydraulic pumps and heavy industry, automotive, shipbuilding, aerospace and military technology as well as power generation components for over 1,000 customers around the world. In addition, the company has a reverse engineering department that utilizes measurements for creating data.

In-process inspection allows to perform the necessary fine-tuning in time to meet the extremely short delivery times that are typical for prototype production. Compared against other manufacturers, new higher standards of quality are set.

In 2004, a coordinate metrology department was set up and equipped with a DEA GLOBAL coordinate measuring machine (CMM) as well as an optical measurement system. The company further expanded and today they have four measuring machines of the DEA GLOBAL type available. To guarantee the inspection of a wide range of parts, the CMMs have been fitted with a PH10MQ probe head and a TP200 probe. As a measurement software, the PC-DMIS CAD++ is employed because the use of CAD data allows efficient programming of datasets. The CMM measuring ranges go from 1000 x 700 x 700 mm to 1200 x 2200 x 1000 and offer a measurement accuracy of MPE = 1.7+L/333 µm to 2.5+L/333 µm.

At the same time, a qualified team of 27 employees have been fitted into the work shift schedule. The number of employees in the quality assurance metrology department is quite unusual for a company of this size. For the peculiarities of prototype production, however, this proves a major recipe for quality.

Coordinate measuring machines are employed in combination with the most diverse roughness and contour measuring systems, and optical measurement systems, to guarantee the standards of quality – starting from production control through to full part sampling according to VDA, aerospace requirements, or specific customer's demands.

To be able to satisfy the very short delivery terms, it is necessary to create complex measurement programs before the actual inspection of the finished parts. For this purpose, they have two offline workstations available. In a year, programs are created for about 600 CMM measurement projects of different housings for the hydraulic industry, cylinder heads, cylinder crankcases for bench and field testing through to turbine components for airplanes.

In PC-DMIS, changes and fine tuning of datasets, that are typical in the design phase, can be exchanged and completed fast and easily. A great saving in time and money is achieved at ACTech thanks to this flexibility of the software.

The requirements and complexity of the castings continue to grow, which is also reflected as early as in the prototype phase. This results in a growing tendency towards dimensional checks to ensure these quality requirements. The coordinate measuring machines equipped with a probe head and combined with the PC-DMIS CAD++ measurement software are exactly the right solution for the huge variety of products and very short implementation times in prototype production at ACTech as a provider of research and development projects.

Ronny Müller, Andreas Knoch

ACTech GmbH - Halsbrücker Str. 51 - 09599 Freiberg/Sa. Germany
Phone +49 (0)3731-169 0
prototype@actech.de
www.actech.de