



A hit in Hyderabad: Fine Forge accelerates production of turbine blades.

Industry leader in the forgings of complex turbine blades, Fine Forge has installed a multi-sensor Nikon Metrology CMM at its Hyderabad facility. The laser scanning acquisition system, used for QA and reverse engineering has helped to increase productivity and to support the expansion of its product portfolio.

Fine Forge is one of the leading steel die forging companies in India. Operating primarily in the power generation sector, Fine forge – ISO 9001:2000 certified company based in Hyderabad – specialize in the manufacture of turbine blades. The company is renowned for its quality and customer service which is maintained by the large workforce including the vastly experienced design and forging teams.

Established in 1989, Fine Forge originally aimed to replace the need for imported turbine blades with locally manufactured components. With the Indian authorities pushing for more locally sourced and manufactured components, Fine Forge stepped up. Since becoming an established company in the energy sector, it has diversified, now supplying steel forgings for power, automotive industries and more.

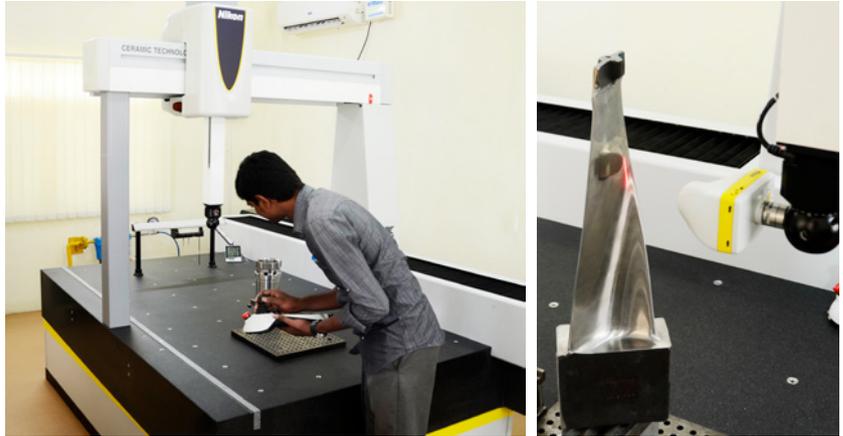
Multi-sensor CMM combines high accuracy and throughput.

The moving blades and guide blades which occupy a large percentage of Fine Forge's production are essential for the optimal functioning of steam turbines. The company is responsible for manufacturing up to 95 types of moving blades and 24 types of guide blades, all of which have differing, complex geometry. Fine Forge required a system that could make 3D scanning easy for the wide range of varying shapes and sizes. The blades, which are made from X20, X10 & X22 compositions of stainless steel, are developed and supplied to different customers for applications in the power and industrial sectors.



Beside accelerating our blade production, we are also able to explore new possibilities in pipe fittings and heavy truck components.

Vinod Reddy (Managing Director)



■ The CMM operator sets up an inspection of the turbine blade with the LC15Dx laser scanner.

Fine Forge previously used manual and destructive measurement methods which were counter-productive, with data collection methods particularly time-consuming as well as the waste of expensive materials and parts. Fine Forge wanted replace its manual methods and find a method that could introduce reverse engineering capabilities to help slash CAD design turnaround times.

These points were the criteria before consulting an array of CMM suppliers. It was detailed that a fast and accurate multi-sensor system that could facilitate QA and reverse engineering was required. After consulting other suppliers and searching the market, it was discovered that Nikon Metrology could provide the most full and comprehensive solution.

Increasing productivity, better insight and introducing new possibilities

The multi-sensor ALTERA CMM with CAMIO, combines touch probing, SP25 continuous scanning and laser scanning, providing Fine Forge with a complete inspection toolbox. Regarding accuracy, the Nikon LC15Dx is closing the gap with tactile inspection systems, delivering the most accurate results possible for a laser scanner. Thanks to the optical chain design using a Nikon focusing lens, the scanner is able to obtain a probing error of just 1.9 μm . Not only does the scanner facilitate the measurement of complex shapes, but the LC15Dx does so with speed and precision, giving Fine Forge a formidable tool for all inspection and reverse engineering requirements.

The SP25 is the perfect partner for the laser scanning probe. For difficult-to-access elements such as internal features and diameters or in the case of only a few sections to measure, the tactile SP25 is the perfect solution. In CAMIO, changing the laser scanner and tactile probes is complete with just a few clicks of a mouse.

After the installation of the Nikon system, the team at Fine Forge have expressed their satisfaction with the investment and the opportunities introduced. The multi-sensor CMM is equipped to deal with many

challenges, helping to reaffirm Fine Forge's status as a market leader. The productivity increase since the installation has helped the team to look for new possibilities and expand into different sectors. Vinod Reddy, managing Director at Fine Forge explained that with the installation of the Nikon system, they are now able to explore new possibilities in pipe fittings and heavy truck components.

Vinod explains that the Laser Scanner has been a "phenomenal advantage" for Fine Forge, as it has enabled easy migration from the power industry to heavy truck components and pipe fittings. Mr. Reddy continued to explain that many of the pipe fitting manufacturers never had the drawings for the parts, but the introduction of the LC15Dx, with its reverse engineering capabilities made exploring this market possible. Shortly after checking the materials and mechanical properties, the build was ready to begin. As the power industry has peaked, Vinod is happy to be able to seamlessly shift from one industry into another with their new reverse engineering capabilities.

However, turbine blade manufacture does still remain part of the business today. The introduction of the Laser Scanner now enables the measurement of larger complex sheet metal blades, which wasn't possible before. Previously inspection of larger blades was dominated by competitors, but Fine Forge has now moved a step ahead. Many other companies in the region are still using probing, but the Nikon Laser Scanner gives Fine Forge the distinct advantage, making easy work of inspection tasks, providing a detailed analysis in the form of instant, easy-to-interpret results.

Following the success of the Nikon installation, Fine Forge have been vocal about the improvements they have experienced and have been proactive in promoting Nikon Metrology throughout Hyderabad. The praising words have been instrumental in the installation of Nikon systems at other manufacturers within the region. The resounding success proves Nikon to be the perfect fit for all inspection and measurement needs.