Turbomachinery: Quality assure different components with one probe

This application note describes how to quality assure and measure the hardness of several different components with just one probe.

Turbomachinery components for high temperature and pressure

Gas turbines and steam turbines work under high temperature and pressure environment. Some components even sustain dynamic loadings. It is essential to check the hardness of different components of turbines to ensure enough strength as well as other parameters e.g. anti-fatigue performance.

Components with hardness exceeding the required boundaries might lead to severe consequences. For example, turbine blades with less hardness than required might crack and then break during operation, fly out at a high speed, damage infrastructure and hurt people.

Different test loads for different applications

Screening Eagle customers around the world us the Equotip 550 UCI and Equotip Live UCI to assure the quality of turbines. Previously, the customer was using UCI probes which only allow one test load per probe. Due to the test load requirements from different components, they need to purchase and maintain multiple probes.

The unique “adjustable test load” feature of Equotip UCI probes allows customers to measure hardness on different components with only one probe. For instance, HV1 test load is selected to measure on thin coating layers of the turbine blades, HV5 test load is selected to measure on big bolts and HV10 test load is selected to measure on the rotor. It is very convenient for customers to carry only one probe to cover all the applications they need for the entire turbine.



caption

Quick on-site test thanks to the portability and unique feature: 3-in-1

Before the turbine is assembled together, customers take the device to quickly test different parts one by one on the manufacturing sites. Once the turbine is assembled and installed, customers easily take the device to power plant sites and quality assure the entire turbine during e.g. scheduled outages.

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