

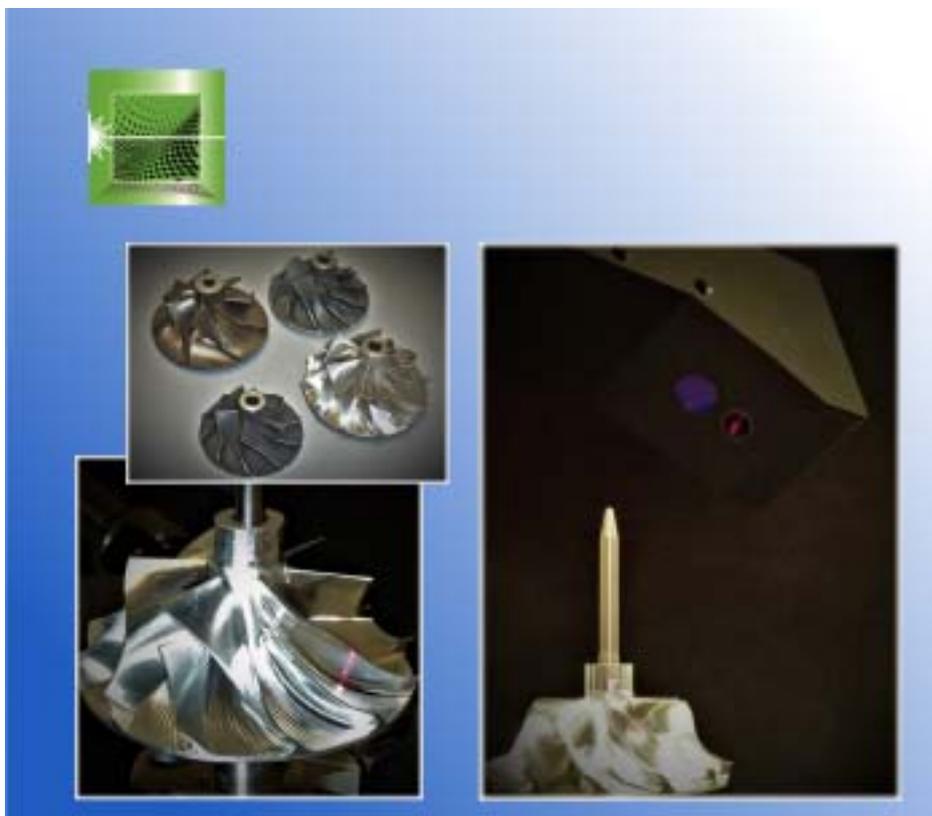
Press Release Sensor Instruments

March 2020

Frequency of Compressor Wheels

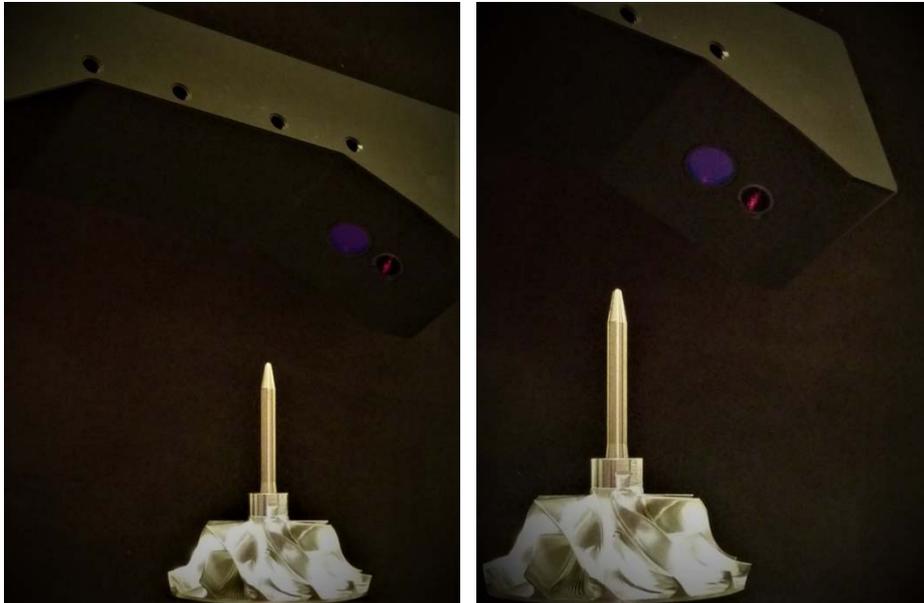
23 March 2020. Sensor Instruments GmbH: The task is to measure the frequency of compressor wheels that are used in turbochargers. These wheels may reach speeds of up to 300,000 revolutions per minute. Usually these compressor wheels have about 10 blades and are made of milled aluminum. If the frequency of these compressor wheels should be determined optically it must be taken into consideration that every blade causes a signal change - which means that up to 3,000,000 switching processes must be expected per minute, resulting in a frequency of approx. 50 kHz (of the blades). Even an edge detector of type **RED-50-P** or **RED-110-P** with its maximum scan frequency of typ. 100 kHz will work up quite a "sweat" here.

Normalised evaluation of the two receiver signals and dynamic automatic laser power control allow an evaluation that to a large extent is independent of the surface. The sensor's output provides both the direct switching signal change per blade (0V/+24V) and an analog signal proportional to the frequency (0V ... +10V or 4mA ... 20mA) - Perfect measurement results in this high-speed application!





Optical frequency measurement for compressor wheels with speeds of up to 300,000 rpm



Largely surface-independent evaluation with the edge detector RED-110-P



Signal evaluation of edge detector RED-110-P with the RED-Scope Windows® software.

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