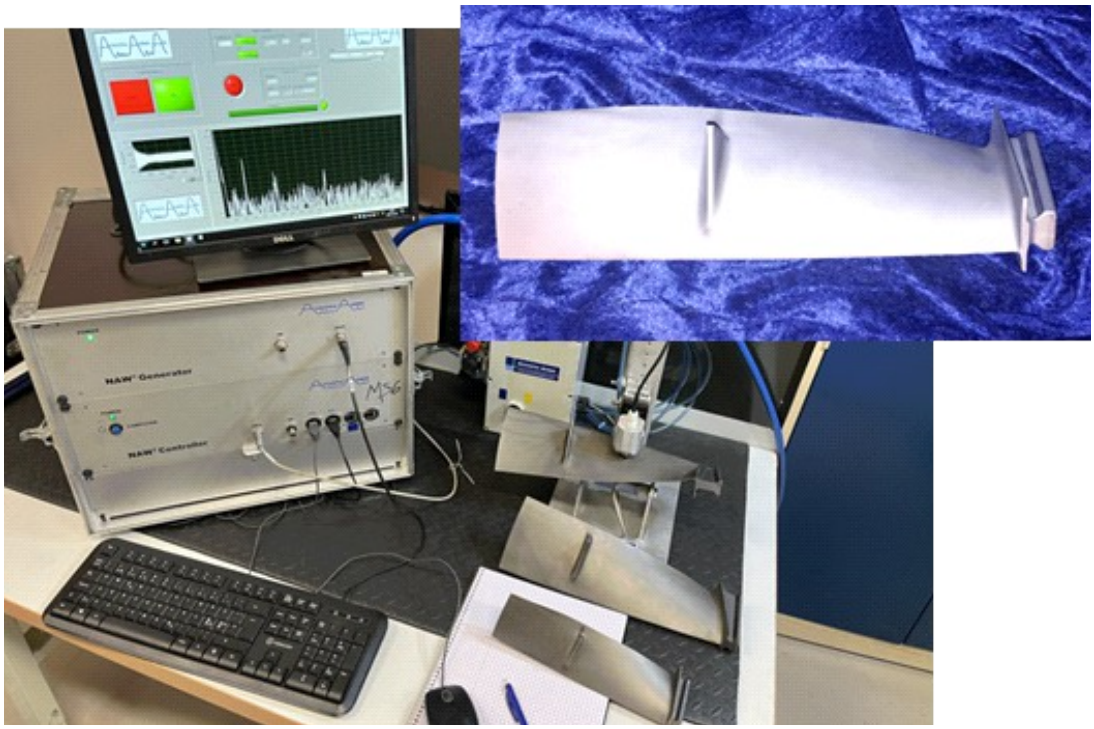
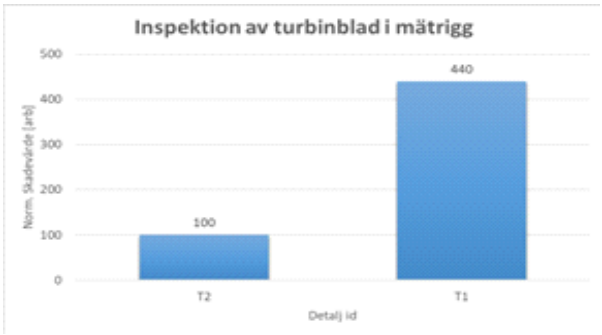
NAW®-inspection of Turbine blades:



Turbine blades are exposed to stresses such as vibrations, pressure variations, temperatures and more. Inspecting turbine blades is challenging but using NAW® inspection we can listen for deviations from perfect sound carrier indicating damages. A damage starts as rifts in the materials grain structure, when rifts grow together a crack has developed. Cracks and rifts in a structure carries sound different to a undamaged structure, the damages create anomalies in sound that can be measured.

“Sound signature” is a simplification. Physically, sounds are energy pulses, some in hearable frequencies, others not. A good undamaged sound carrier conducts energy pulses swift and smooth without gaps through its grain structure, while a damaged sound carrier with its gaps and voids conducts sound slow and interrupted. The damages causes deviations in sound, “echoes”, that we can measure and calculate. A large crack is very audible in our systems, but also small rifts that not have grown together to form a crack can be heard although they have not affected the strength...yet.

To “hear” a crack buried deep in a turbine blade, the part is vibrated with bursts of energy (sound) around its resonant frequency. Resonance frequencies pushes a material's ability to hold together at its hardest making any rifts or cracks in the grain structure “audible”.



Inspecting a turbine blade takes ca 20 seconds with NAW® inspection. The result is a “damage value”, a calculation of the total amount of damage in the part that determines whether the blade can be used again or not. If inspecting same turbine blade regularly a damage progression can be calculated estimating remaining service life for individual blades.