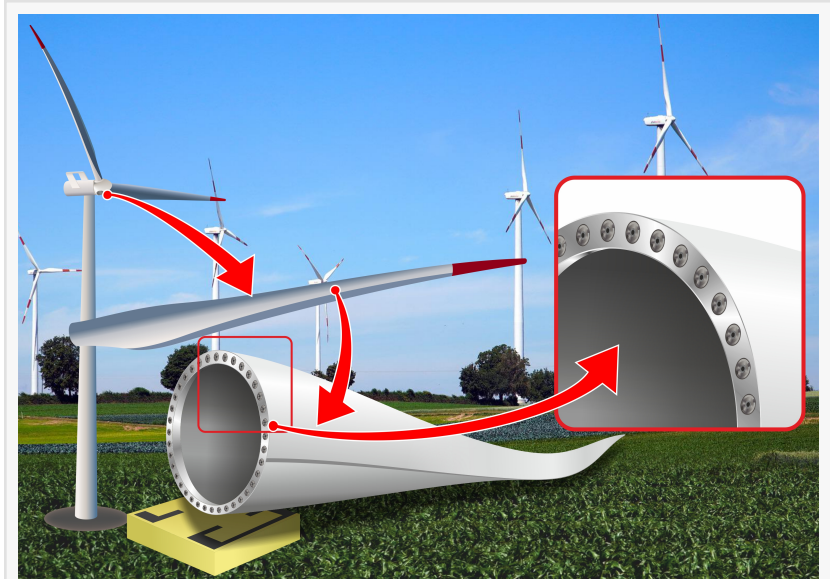


Denmark's CNC Onsite first to offer onsite wind turbine blade root repairs

Blade inserts replaced in days; no blade transport costs; environmental benefits; alternative to decommissioning; Partner: We4Ce; WindEnergy Hamburg premiere

VEJLE, JUTLAND, DENMARK, September 8, 2022 /EINPresswire.com/ -- Blade root damage to older wind turbines previously could only be repaired at the manufacturing site, requiring expensive logistics and long downtime, which often left operators with no choice but to purchase a new blade or scrap the entire turbine. With its new portable tool developed to efficiently replace damaged inserts in blade roots, Danish company [CNC Onsite](#) will be the first to offer economical precision repairs carried out at the wind farm, eliminating transport costs - financial and environmental - as well as waiting times for a repair slot.



With CNC Onsite's method, the rotor blade is dismantled before it is placed in a repair environment at the wind farm. The damaged inserts are then drilled out and replacement parts inserted.

“

Previously, the only way to repair inserts in the blade root was to take off the whole blade and transport it to the manufacturer. This means high costs. Also, it's difficult to get a repair slot.”

Søren Kellenberger, sales director, CNC Onsite

Embedded into the blade root during the manufacturing process, the threaded inserts that are critical for joining the blade to the nacelle hub can over time become loose. In older blades, microcracks can form, which allow contaminants such as grease and hydraulic oil to weaken the bonding. This ultimately endangers the structural safety of the blade root, especially when fatigue loading is high. At worst, this can result in the blade breaking away.

Blade root repaired at wind park

With CNC Onsite's method, the rotor blade is dismantled

before it is placed in a repair environment at the wind farm. The portable, automatic machining tool aligned to the blade drills away the faulty inserts from the composite material. Ensuring the cavity matches the exact diameter and shape of the replacement part, an additional, precise drilling process is performed so that the new part can be inserted and then fastened using bonding material.

“Repairing the blade root inserts onsite can be a complex operation. You need to be able to control several process parameters to ensure you do not do more damage to the blade and it is important to drill exactly in the center of the existing inserts,” explains Søren Kellenberger, sales director, CNC Onsite.

Developed in response to the needs of operators looking for an onsite repair service, the new tool benefited from the company’s proven CNC-controlled machine technology used to perform repairs to the yaw ring and tower flanges in line with micrometer tolerances.

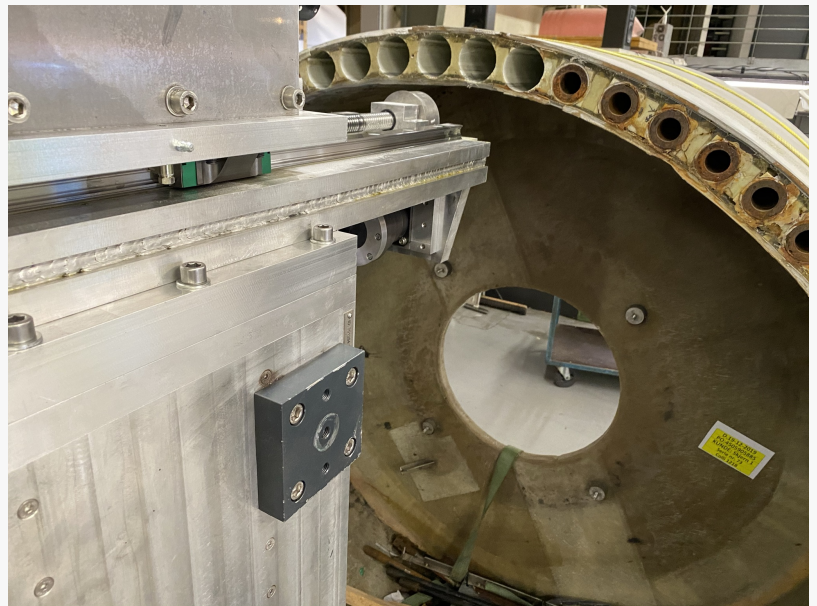
“Currently, the only way to repair wind turbine threaded inserts is to take off the whole blade and transport it to the manufacturer. The first challenge is the enormous costs of transporting the blade on public roads. Secondly it's difficult to get a repair slot as manufacturers are extremely busy building new blades.

“For every handling and transport process you risk damaging the blade structure, so in all aspects a repair job onsite is preferable when you can achieve the quality we are able to, with our new service,” adds Kellenberger.

CNC Onsite and [We4Ce](#) offer full service



Before and After: Damage to blade root inserts (above) and after



CNC Onsite's machining tool can drill out damaged blade root inserts to micrometer precision.

CNC Onsite has teamed up with We4Ce, an international blade rotor and blade root connection expert, to deliver a complete repair solution focused on high-strength blade roots.

“The difficult parts of replacing a threaded insert - also referred to as bushings - are first of all centering the replacement part and secondly the processing technology for the bond. Based on our track record since 2008, we have developed inserts with a design that considers both. This full solution offers consistent and stronger bond between the insert and the blade,” explains Edo Kuipers, Engineering Manager and Co-owner of We4Ce.

Older blade designs: Shorter lifetime

The energy transition to using more green power means the blade manufacturers are not only running at full capacity producing new blades, but older blade models are often phased out after some five to 10 years, which means the mold has to be recreated. One of the most fragile components of the wind turbine, the blades are also the most expensive components accounting for some 25 to 30 percent of the build cost.

Replacing blades on older turbines is often not financially feasible. The operator may decide to keep the turbine running at reduced capacity or even decommission it. Keeping the turbines running is important to meet renewable energy targets and this repair service can play an important part in extending the lifetime of existing turbines.

Repair service from autumn 2022

To haul a blade, an oversized load, costs many tens of thousands of Euros and also requires detailed planning and approvals, in addition to downtime costs. The energy-efficient repair service from CNC Onsite will be offered at a fraction of these costs.

Efficient repair of wind turbines is increasingly a vital element of the renewable energy transition. Issues with threaded inserts are usually detected during maintenance and mostly occur in turbines older than 10 years. The new blade root repair is estimated to take two to three days, depending on the number of faulty inserts, as opposed to previously spending many months at the manufacturer.

“From our many discussions with potential customers, it is clear there is a need for onsite repair. From late autumn this year we will be offering the service, which we believe is the first on-site method. This will be available for all blade sizes,” concludes Kellenberger.

CNC Onsite’s blade repair solution, as well as its flange milling tool for 10-metre turbines and a patented yaw ring repair method, will premiere at WindEnergy Hamburg, 27-30 September, Hall B, stand EG.504.

About CNC Onsite

Headquartered in Vejle, Denmark, CNC Onsite designs and delivers high-precision mobile machining for wind turbines, including offshore foundations. Machines built by CNC Onsite are designed to be flexible using its proprietary "building blocks" approach, meaning machinery can be built to match a range of tasks. CNC Onsite serves the onshore and offshore wind energy sector delivering as standard solutions: machining large diameter steel flanges and blade root ends; specialized repair services covering yaw ring, inserts in the blade root, rotor lock, generator shaft, bearing housing and threaded holes. Removal and replacement of worn and broken bolts round off the offering.

Editor's note:

Threaded inserts and bushings are synonymous. Microcracks can occur due to polymer shrinkage, sometimes arising due to discrepancies between the volume levels of resin used between the prefabricated composite components and threaded inserts and the volume used between the root laminate and inserts.

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