CNC solutions for the rotor blade drilling and milling

blade root machining

CMS Industries
CNC solutions for the rotor blade drilling and milling
CMS INDUSTRIES
FOR BLADE ROOT MACHINING

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Founded in 1969, CMS Industries has reached a turnover of 100 millions Euros, with more than 500 employees, 4 subsidiaries and a worldwide sales network. CMS Industries products, CNC machining centres, thermoforming machines, CNC cutting robots, waterjet systems, compete to produce space shuttles, military and civil aircrafts, Formula 1 cars, competition and road vehicles, America’s Cup boats, yachts, wind power generators. Every machine delivered is produced utilizing the high level of technical competence, precision and quality that comes as standard with CMS products. Each design is based on the fundamental basics of CMS technology but tailored to customer’s individual needs. These solutions cater for all customer requirements from single process operations right up to the mass production of similar parts with each process optimized to suit - all backed up by a worldwide customer support network.

Competence and passion at the service of the customer

CMS Ares machining centre producing the model and trimming the composite nose component of a competition car

CMS Poseidon for the plug production

CMS Cronus machining an aircraft part
Why to process the blade root by CNC trimming (by blade) and finishing

The accurate processing of the blade root is a key factor reducing rework and increasing wind turbine life.

The drilling and milling of the blade root is a fundamental requirement in the mechanical assembly of the blade and hub and the level of precision has a major influence on the operation of the entire wind turbine.

CNC vs PLC
The CNC-based architecture gives a great advantage in flexibility and in an easy reuse of the same system for several models of rotor blade. Different models can be produced simply by changing the CNC program. A new CNC program can be automatically generated by post-processing the relevant CAD/CAM project. With the PLC-based solution a change of model needs a new set-up/testing of the whole system, along with relevant additional costs. Basically a PLC-based solution is dedicated to only one or few models of rotor blades.

CNC vs robots
While a solution based on robots may seem to be the most flexible and easy to use, it has serious limitations and drawbacks when put into practical use. These include – lower processing accuracy due to its geometry, inefficient dust suction/removal, creating a dirty environment, each robot has to be treated as a single machine meaning a low integration level and longer testing time, due to the complicated post-processing, an higher risk of errors.

By using the CMS machining solution the precision level of this process ensures the highest degree of accuracy on the market and thus the most effective wind turbine operation.

drilling in axial and radial direction
Why CMS EOS

simultaneous machining with two operating units

automatic blade alignment

due to the unique technology of CMS tool cooling systems are not required

• productivity, accuracy and repeatability
• flexibility - allows processing of new and different models of rotor blade
• less manual operation needed
• safer and cleaner working environment

EOS offers a complete coverage of the drilling and milling process of the rotor blades and all the benefits of an automatic solution, with the architecture base of CNC machining centres

Processing time: 2 hours 30 minutes
(example: blade diameter 2200 mm and 50 T-bolts. Simultaneous machining with two operating units. T-bolts needing 2 holes: 1 radial + 1 axial. Automatic blade alignment included. No tandem cycle. No T-bolts insertion)
Main features

• Single or double 5 axes operating unit with tool changer magazine.
  Electrosindle power: 28 kW.
• Full enclosure and suction hoods on each operating unit.
  Very efficient dust extraction.
• Rotor blade holder: carriages managed by CNC, fully integrated with the system.
  Automatic blade alignment.
  The CNC program of each blade is automatically adjusted to the actual position of the blade.
• Options: tandem cycle; T-bolt insertion.
Founded in 1969, CMS SpA (Costruzione Macchine Speciali) merged together four companies under the brand CMS Industries which has reached a turnover of 100 millions Euros, with 3 production facilities, 4 subsidiaries and a worldwide sales and service network. CMS Industries is specialized in producing multi-axis CNC machining centers, thermoforming machines, CNC routers and waterjet cutting systems which represent the answer to the high demand of the leading industries in the Aerospace, Automotive, Marine Industry, Wind Energy, Stone, Glass and Wood sectors. This wide products line, joining together quality and precision, offers a comprehensive range of flexible, innovative and cost-effective solutions to cover several production phases or to be customized for specific processes. From 2002 CMS SpA is part of SCM GROUP (www.scmgroup.com)