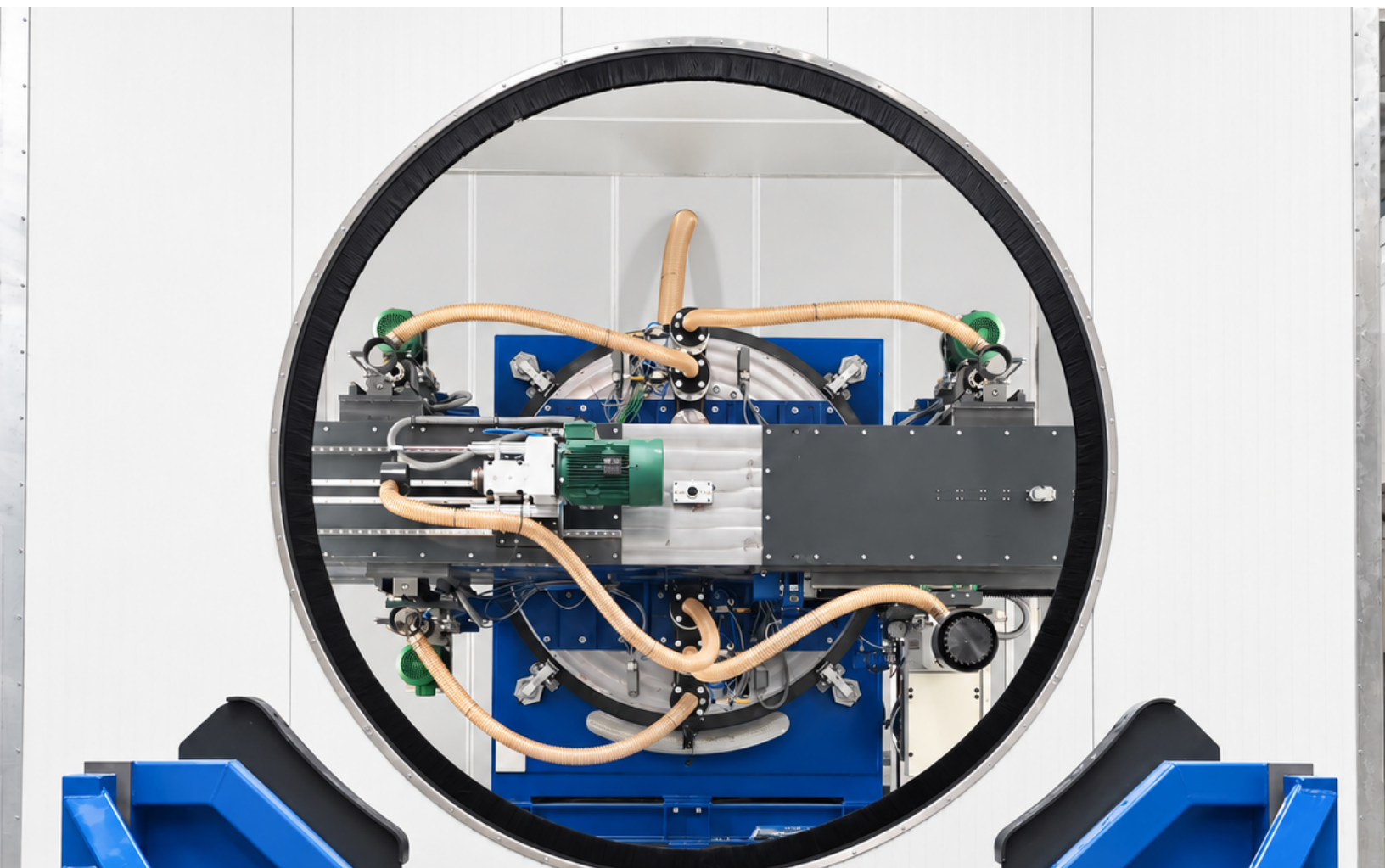


HBBA

Built around
your blade.

Custom rotor blade
root machining



01 / THE HBBA PLATFORM

Your diameter. Your production. Your HBBA.

30

years of
experience

We build the HBBA around the root diameter you need. Smaller or larger, every machine is engineered for your blade geometry, connection design and production process.

A complete process for the blade root

Sawing, face milling and axial and radial drilling prepare the rotor blade flange for connection to the hub.

Onshore and offshore

For composite blade roots after bonding and demoulding.

Highly customizable

Diameter, supports, machining functions and factory interfaces follow your requirements.



One integrated machining process.

01 Position

The guided first support aligns and advances the blade into the machining area.

02 Saw

A PCD saw trims the excess laminate from the blade root.

03 Face mill

The milling unit finishes the flange face to the required plane and final blade length.

04 Drill

Axial and radial units drill in parallel. Programmable cycles match the specified hole pattern.

Dry machining within an enclosed working area.

From your blade drawing to your HBBA.

Your blade and production requirements define the machine. Together, we turn them into a practical machining solution.

01

Define the blade.

Root diameter and geometry. Connection concept and hole pattern. Required machining operations, tolerances and surface finish.

02

Configure the machine.

Select drilling and milling units, tooling and blade supports. A dedicated two-unit milling configuration is available when drilling is not required.

03

Integrate the process.

Coordinate the factory layout, handling routes, extraction and utilities. Plan access, installation and operator requirements.

Milling-only. Already in production.

Heinicke reports faster processing with less adjustment and measuring in a milling-only installation, compared with alternative systems in that application.

Different connections. Purpose-built machining.

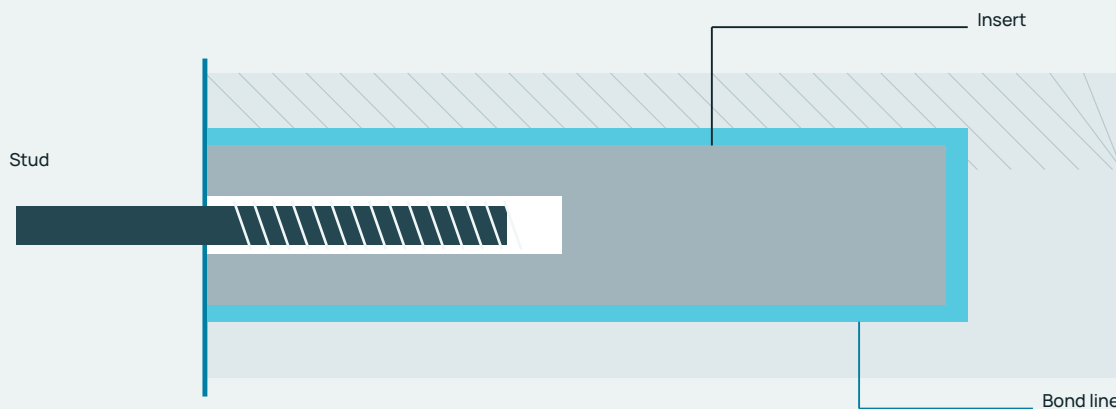
Axial and radial drilling is the HBBA's core application.
Bonded inserts still need an accurately milled root face.

Axial studs & radial cross-bolts



The stud engages the cross-bolt through intersecting axial and radial holes. The HBBA combines root-face machining with the required drilling operations.

Bonded threaded inserts



The stud engages an internally threaded insert bonded into the blade root. For this concept, Heinicke can build a milling-only HBBA with **two milling units**.

Simplified connection principles; not to scale. Final geometry follows the blade design.

05 / TECHNICAL CONFIGURATION

The diameter is your choice.

Ø 4,000 mm

One example. Not a limit.

We design and build for the diameter your application requires, from smaller roots to larger blades.

Machining diameter	Specified to your blade and required working range.
Processes	Root trimming, face milling, axial and radial drilling.
Drilling	Simultaneous axial and radial operation with programmable cycles.
Blade positioning	Guided first support and blade-specific support geometry.
Production targets	Accuracy, tooling and cycle time defined for your application.
Equipment scope	Enclosure, extraction, monitoring and additional functions tailored to the installation.

06 / OPTIONS

Tailored at every level.

The right configuration connects blade handling, machining and the way your factory operates.

01

Blade handling

Support shapes and quantities matched to the blade. Optional covered first support with central lubrication.

02

Machining & extraction

Additional drilling units, milling arrangements with axial and radial movement, and high-capacity dust extraction.

03

Control & service

Remote monitoring, power monitoring, visual and audible alarms, UPS and additional access protection.

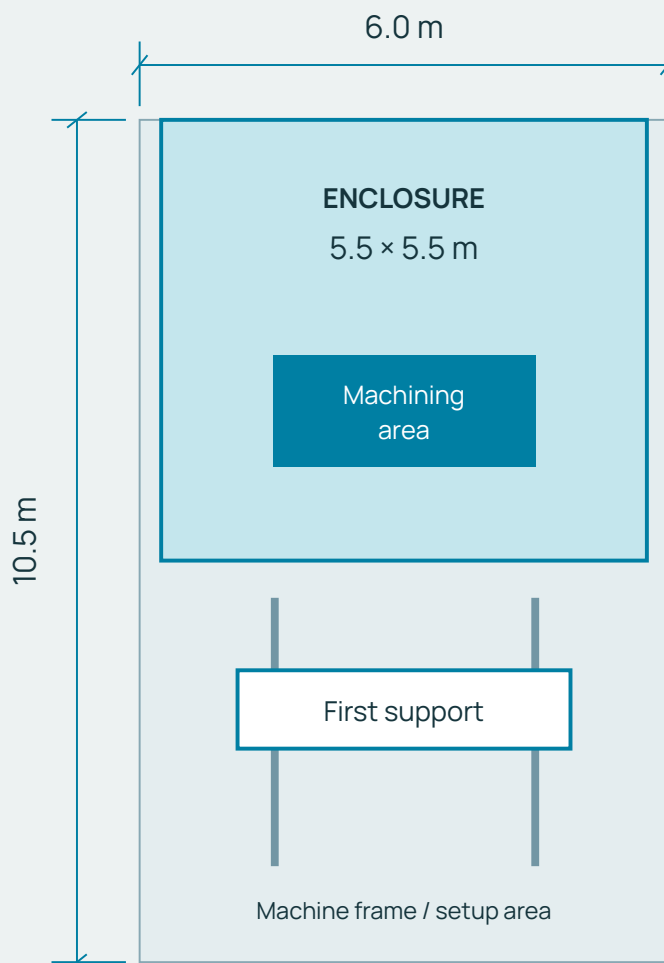


Further functions and special constructions developed around your requirements. Option availability and combinations depend on the agreed configuration.

07 / FACTORY PLANNING

Built to fit your production.

Footprint and interfaces follow the machine you need. This offshore layout illustrates the planning approach.



10.5 × 6 m

Example setup area

5.10 m

Example cabin height

300 mm

Minimum slab thickness in the referenced offshore setup sheet.

Allow additional space for the complete blade, further supports, handling, service access and extraction. Final dimensions and foundation design follow the approved installation plan.

08 / SITE READINESS

Ready for installation.

The figures below describe an example offshore installation. Utilities, lifting equipment and foundations are specified for each HBBA.

Electrical power	18 kW without industrial vacuum system 40 kW with industrial vacuum system
Supply & connection	3-phase + N + PE, 400/230 V, 50-60 Hz Published reference: 5 × 16 mm ² cable, 63 A
Compressed air	10 bar supply Approx. 30 m ³ /h for drilling
Installation equipment	Overhead crane: minimum 10 t Forklift: minimum 1.5 t Hydraulic access lift: minimum 5 m working height

Commissioning

Coordinate delivery routes, installation and commissioning with Heinicke. Provide the agreed foundation and handling equipment.

Daily operation

Plan trained operators, suitable dust extraction and clear access for cleaning, inspection and maintenance.

Planning reference: published offshore setup sheet. Final cable sizing, protection, internal air settings and all site requirements follow the approved machine documentation.

09 / ACCESSORIES

Components for your blade root.

Heinicke has supplied cross-bolts and threaded studs in series production for wind turbine blades.



Bonded block inserts

Internally threaded block inserts for direct bonding into the blade root. This concept replaces the intersecting axial and radial holes used for a T-bolt connection.



Cross-bolts / barrel nuts

Cylindrical cross-bolts sit in the radial holes of a T-bolt root connection. Their transverse internal threads engage the axial studs.



Double-ended threaded studs

Studs pass through the axial holes and screw into the cross-bolts. Dimensions, threads, materials and finishes follow the approved component drawing.

Retouched reference images. Component selection and connection design follow the approved blade specification.

10 / OPTIONAL HBBA EQUIPMENT

Equipped for your production.

UPS system

Uninterruptible power supply for the agreed circuits. Backup capacity and duration are specified for your configuration.

Beacon lights & buzzer

Visual and audible alarms and notifications make machine status apparent on the production floor.

Second axial drilling unit

An additional axial drilling unit, integrated into the machine configuration and programmed drilling sequence.

Second radial drilling unit

An additional radial drilling unit, configured to suit your blade-root geometry and machining requirements.

Fully covered first support

Covers protect the rails, spindle, motor, sensors and guide carriages from the production environment.

Automatic central lubrication

A central lubricating system supplies the first support at defined intervals to support routine maintenance.

Extended first-support rails

Longer rails provide more space between the cabin and blade root. Travel and layout follow your requirements.

Additional blade supports

Extra supports, with support geometry and positioning matched to the blade and factory layout.

TOOLING / QUICK START SET

Ready with the right tools.

One axial drilling tool, one radial drilling tool, one milling head, one saw blade and tool adapters.

Your requirements are the starting point.

Additional options and customer-specific changes are welcome.

11 / HEINICKE

30 years of experience. Built into your HBBA.

Designed and manufactured in Lemwerder, Germany.

Heinicke brings machine design and in-house manufacturing together for rotor blade production. Every HBBA starts with your application.

Talk directly with the team about your blade geometry, machining process and factory integration. After-sales service supports the machine in use.

Let's build your HBBA.

Bring your root drawing and production targets.

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