

ZF Wind Power utilises ActiveEdge Nexus to improve process on large diameter boring operations

Project Overview

- **INDUSTRY:** Windpower
- **LOCATION:** Belgium
- **COMPONENT:** Gearbox Castings
- **MATERIAL:** STEEL
- **BORE SIZE:** $\varnothing 360$ to $\varnothing 670$ 0/T
- **TOLERANCE:** -0 +0.40 (Typical)

ZF Wind Power, industry leading manufacturer and supplier of wind turbine gearboxes, was seeking a superior solution to certify precision bores upwards of $\varnothing 360$ mm to an H6 tolerance, running on Horizontal Machining Centres (HMCs).

Prior to Rigibore's Involvement, ZF was using traditional flange boring tools. In-process measurements were also obtained manually.



Rigibore's **ActiveEdge Nexus** was selected for precision machining large diameter bores on ZF's Gearbox Castings



The Challenge

Difficulty In Adjustment

1

Due to the large casting size and restricted access, the task of manually measuring critical component features and tool setting was difficult. Process safeguards to ensure operator safety could also negatively affect production.

Machine Downtime

2

Ambient temperature changes meant that bore sizes could drift, leading to additional downtime to manually readjust the cutting edge during the machining cycle.

ZF required a more efficient approach to help them increase output and meet customer lead times.

Part Quality

3

The initial cost of the casting partnered with high setup cost and additional machining time meant that scrapping a part was simply not an option. Complex, manual adjustments in the machine compromised this.

Rigibore's Solution

The Tool

Rigibore developed the ActiveEdge Nexus boring module for this particular application. When partnered with a Wohlhaupter flange, this tooling solution is the perfect combination for large diameter boring applications of $\varnothing 275\text{mm}$ - $\varnothing 1020\text{mm}$.

Automated Sizing

This automated system combines the Nexus with in-process measurement to monitor bore sizes and compensate as the insert wears during the machining cycle.

The Process

The Zenith solution allowed ZF to implement a "two-stage finish cut", automatically backing off the cutting edge to machine a pre-finish bore which is measured and the value stored in the machine control, used to compensate to nominal for the finish bore.



Automatic cutting edge adjustments were delivered through ActiveEdge finish cartridges in the Nexus module.

Results

Productivity

Automatic compensation capabilities removed the need for difficult adjustments inside the machine spindle.

Provided the flexibility to adjust the tool anywhere in the machine, including the tool carousel, in order to maximise spindle utilisation.

Automatic adjustments reduced cycle time and accelerated output

Part Quality

Rigibore's "two-cut finish" solution provides verification of a micron accurate bore, removing uncertainty from the operation.

This solution removed all scrap through oversize bores, ensuring bore sizes remain within the pre-determined tolerance band.

Removed operator intervention eliminated the risk of scrap through manual error