ActiveEdge

Micron Accurate Cutting Edge Adjustments Using Wireless Technology

Zenith

Rigibore's Total Automation Solution For Producing Micron Accurate Bores

Rigibore® The Most Accurately Adjustable Boring Tools in the World

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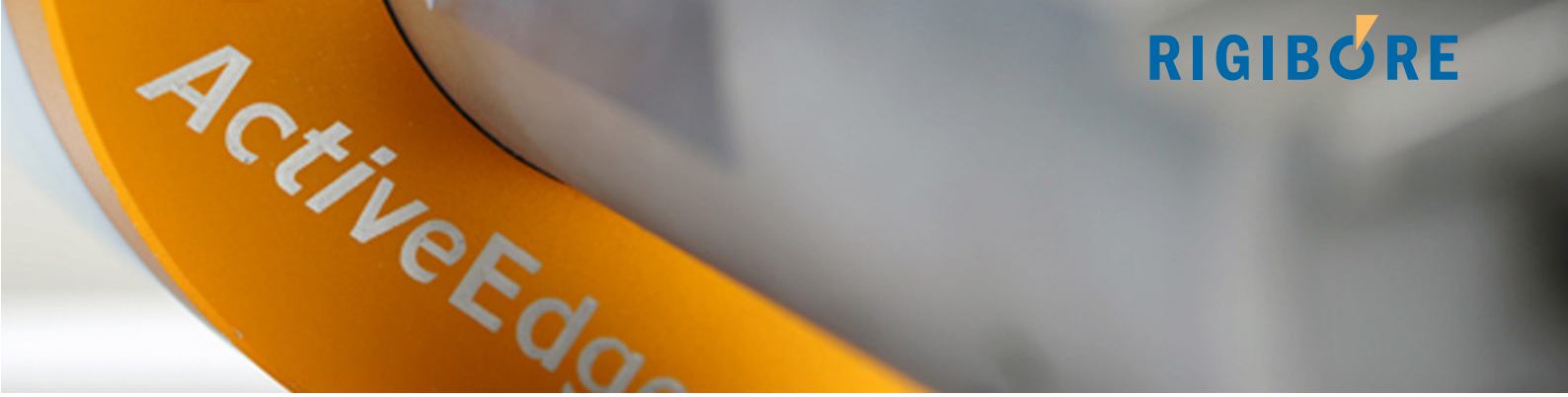
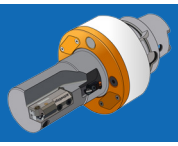
Automation With ActiveEdge Tooling



ActiveEdge

The ActiveEdge Tool



ActiveEdge Boring tools use **wireless technology** to remotely adjust up to **seven cutting edges** on a single tool with **micron accuracy**...

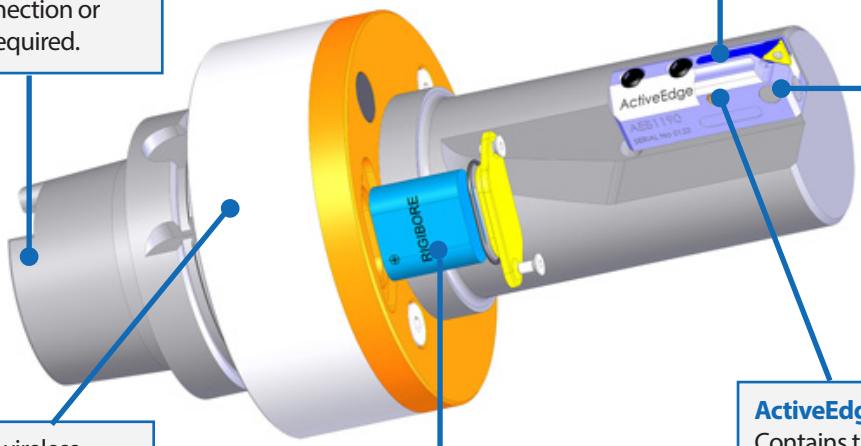
Tool Summary

The ActiveEdge tool is a custom designed boring bar with the capability to adjust its cutting edges with micron accuracy using wireless transmission.

This cartridge-based solution allows up to **seven ActiveEdge cartridges to be mounted on a single tool.** ActiveEdge cartridges are user replaceable.

ActiveEdge tools enable multiple critical diameters to be machined simultaneously, significantly **reducing cycle time** and **increasing process efficiency.**

ActiveEdge Component Diagram



Shank - The tool can be produced with any taper, spindle connection or adapter as required.

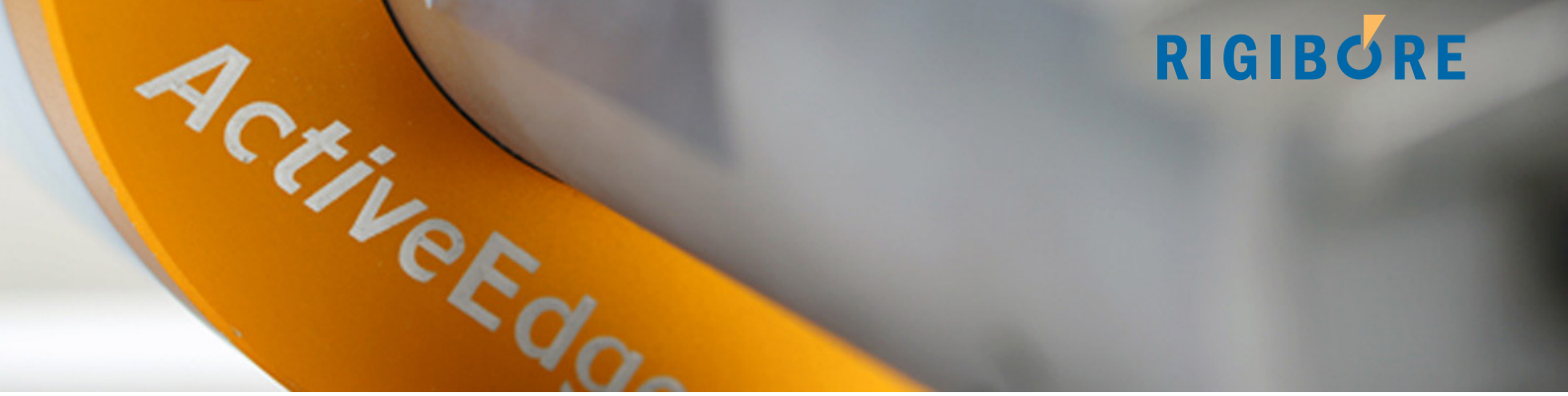
Cartridge Slide - The slide is the only part of the tool moving radially, ensuring no negative impact on tool balance.

Through Coolant - Coolant is supplied through the ActiveEdge cartridge to the cutting edge of the insert.

ActiveEdge Cartridge - Contains the drive mechanism and micron-accurate position sensor.

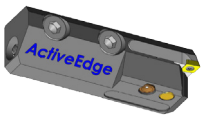
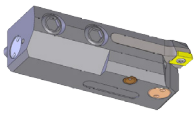
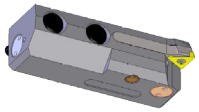
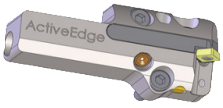
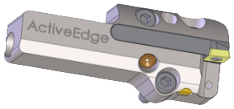
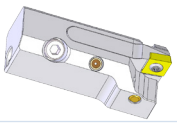
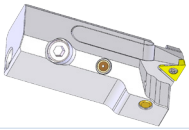
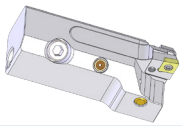
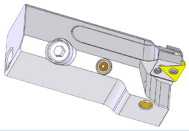
Yoke - Contains wireless hardware that enables the tool to be remotely adjusted inside the machine carousel.

Batteries - The two 6V batteries power the wireless communication and actuation of the cartridge.



ActiveEdge

ActiveEdge Cartridge Data

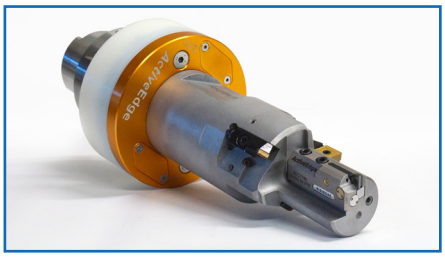
Cartridge Image	Part Number	Minimum Bore	"F" Dimension	Insert	Approach Angle	Notes
		mm	mm	Part Number	°	Additional information
	AEC0490	25	17.9	CP..04T104	90	
	AEC0690	36	25	CC..060204	90	
	AEC1190	38	25	TC..110204	90	
	AEE0650	36	17	CC.060204	50	Through coolant from base of the cartridge pocket
	AEE0690	38	17	CC..060204	90	Through coolant from base of the cartridge pocket
	AEF09T390	38	25	CC..09T304	90	Thicker Insert for large boring applications
	AEF110390	38	25	TC..110304	90	Thicker Insert for large boring applications
	AEF0690	38	25	CC..060204	90	Integral coarse adjust with replaceable insert holder
	AEF1190	38	25	TC..110204	90	Integral coarse adjust with replaceable insert holder

ActiveEdge

RIGIBORE

ActiveEdge Options Overview

Rigibore's ActiveEdge tooling gives precision performance, adjusting multiple cutting edges with micron accuracy using wireless technology.



The ActiveEdge tool allows for a faster, simpler and more accurate boring operation.

ActiveEdge tooling can be used in the following ways:

Option 1 - Remote Controlled (Manual) Adjustment

Precise cutting edge changes are made using the ActiveEdge Remote Control handset. Entering the tool's unique ID and required diameter change into the Remote Control initiates a compensation of the ActiveEdge cartridge.

This option allows remote adjustments to be made to the tool's cutting edges without removal from the machine, r**educing cycle time** and **maximising spindle efficiency without risking operator safety**.

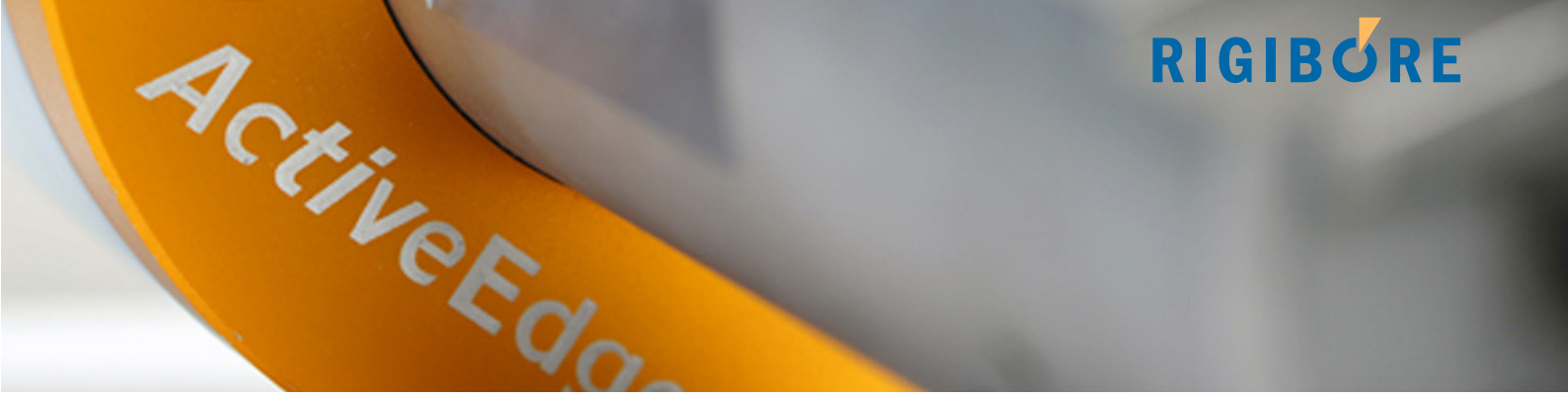
Option 2 - Rigibore's Zenith Solution

The Zenith solution is Rigibore's **total automation solution** for producing micron accurate bores.

Zenith integrates in-process measurement with ActiveEdge boring tools to enable a machine controller to automatically compensate for insert wear, temperature variation and material inconsistency **without manual intervention** and **without stopping the manufacturing process**.

This option provides a speedy and continuous **Return On Investment (ROI)**, reducing machining downtime and eliminating scrap.

Benefit	Option 1- Remote Adjustment	Option 2- Rigibore's Zenith Solution
Micron Accuracy In Adjustment	✓	✓
Reduction In Skill Requirements	✓	✓
Health and Safety Improvements	✓	✓
Adjustments In The Machine Carousel	✓	✓
Reduction In Scrap and Re-work	✓	✓
Improve Process Control (Cpk)	✗	✓
Removed Operator Intervention	✗	✓
Automatic Cutting Edge Adjustments	✗	✓
Lights Out Manufacturing Capability	✗	✓



Zenith

Rigibore's Zenith Solution

Unlock unparalleled savings by **reducing labour costs**, **removing scrap** and supporting **24 hour production through lights-out manufacturing...**

What is Zenith?

Zenith is Rigibore's **total automation solution** for producing micron-accurate bores.

Modern CNC machines, regardless of their sophistication, cannot automatically compensate a boring tool's cutting edges. Rigibore's ActiveEdge tooling in combination with in-process measurement has overcome this problem.

The Zenith system integrates ActiveEdge tools with in-process gauging to enable a machine controller to automatically compensate for **insert wear, temperature change** and **material inconsistency**.

Closed-Loop Manufacturing

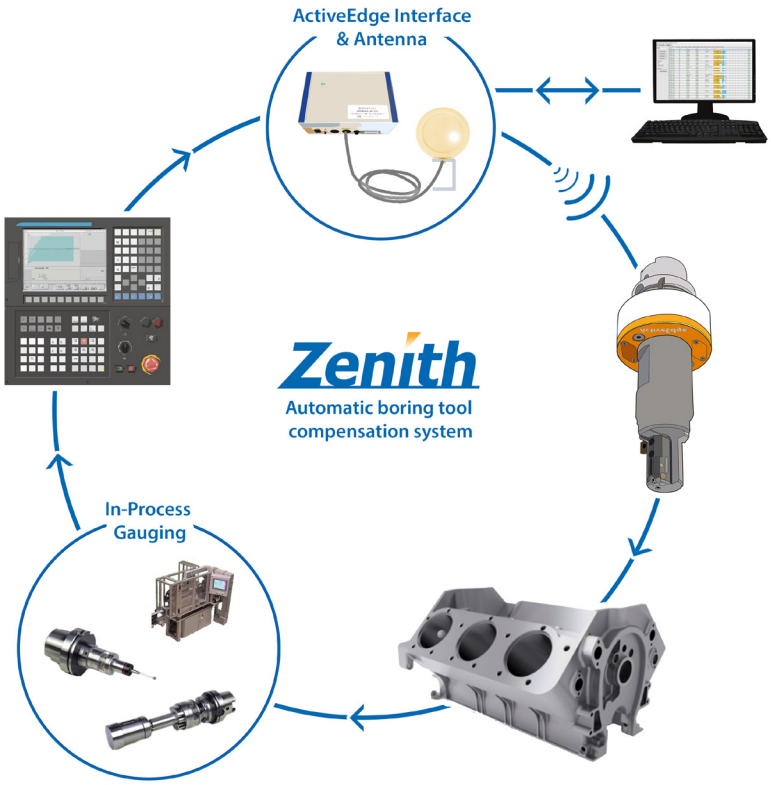
1. Initial Bore — A hole is bored using the ActiveEdge tool.

2. Measurement — The bore is measured using in-process gauging and the measured diameter is placed in a variable in the CNC control.

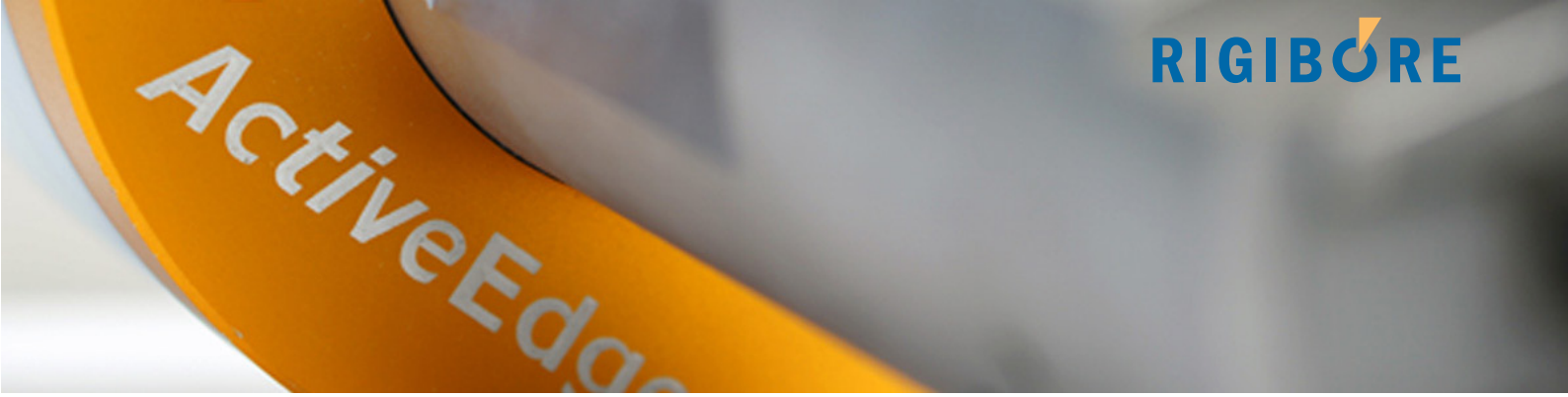
3. Calculation — This measured diameter is assessed against user defined limits. If necessary a compensation value is calculated.

4. Compensation —If compensation is needed, an automatic compensation request is sent directly to the ActiveEdge tool, which adjusts to ensure the next machined bore achieves nominal size.

5.Process Monitoring — *ActiveNet* PC software captures a chronological record of all tool operations and provides easy data retrieval for analysis and optimisation.



Whether high-value or high-volume production is your objective, Rigibore's Zenith solution creates and sustains an accurate and repeatable process to revolutionise your boring operations.



Zenith

Rigibore's Zenith Solution

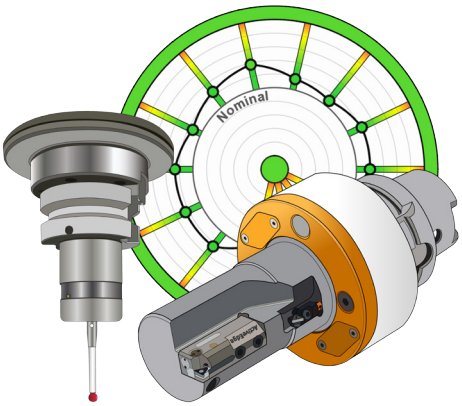
Unlock unparalleled savings by **reducing labour costs**, **removing scrap** and supporting **24 hour production through lights-out manufacturing...**

The Importance Of Accurate Bore Measurements

ActiveEdge tool sizing can only produce micron-accurate bores if micron accurate measurements are provided by in-process gauging.

In order to maximise benefit from the Zenith solution, it is essential that the measurement process is accurate and repeatable.

Rigibore's partnership with metrology experts **Metrology Software Products (MSP)**, a Renishaw associated company guarantees precision probing data for the production of perfect bores in an automated and traceable process.



msp metrology software products ltd
a RENISHAW associate company

Key Benefits - *All the benefits from Remote Controlled Adjustment, plus :-*

Lights-Out Manufacturing

The Zenith solution supports 24-hour production through lights-out manufacturing, accelerating output.

Remove Operator Intervention

Removing operator intervention reduces cost whilst ensuring precision tolerances are met on boring operations.

Automatic Cutting Edge Adjustment

Micron accurate adjustments are triggered automatically from measurement data.

Eliminating Scrap and Re-Work

This automated solution delivers supreme consistency and repeatability.

Zenith

Return On Investment

Zenith's precision performance and repeatability provides tangible and continued savings, **reducing machine downtime** and **eliminating scrap...**

Eliminate Scrap

Zenith can provide a speedy and continuous **Return On Investment (ROI)** , far outweighing the cost of the initial outlay, especially on high value components.

This automated solution ensures micron-accurate manufacturing, **removing the risk of scrap** and **maximising production.**

Adjustment In The Carousel

This automated solution adjusts the tool anywhere in the machine envelope, minimising the time which the tool spends idle and maximising spindle utilisation.

Manual Adjustment	Automatic Adjustment (Zenith)
Stopped for several minutes while operators make adjustments.	Adjustment in a matter of seconds, minimal spindle downtime.
If operators are occupied with other tasks, the manufacturing operation halts altogether.	No operator intervention, staff are available for other shopfloor activities.
Relies on skilled operators to make accurate adjustments.	Reliable, micron-acccuracy in adjustment.
Difficulty in adjusting in the machine spindle, risk of errors and oversized bores.	A streamlined and efficient process, reducing cycle time significantly.

Increase Productivity

Automating the bore sizing process facilitates accelerated productivity without increasing variable costs associated with production.

- Lights-out manufacturing allows production to run 24/7.
- Rigibore macros set an upper and lower warning limit on bore sizes to ensure the bore specification is not exceeded.
- Automation eliminates reliance on a skilled operator being present to carry out precise manual adjustments.