Knowledge Sharing Centre | Manufacturing Technology Conference 2023

JINGDIAO

In-machine Measurement and Intelligent Modification Technology

2023-06

北京精雕

In-machine Measurement and Intelligent Modification Technology

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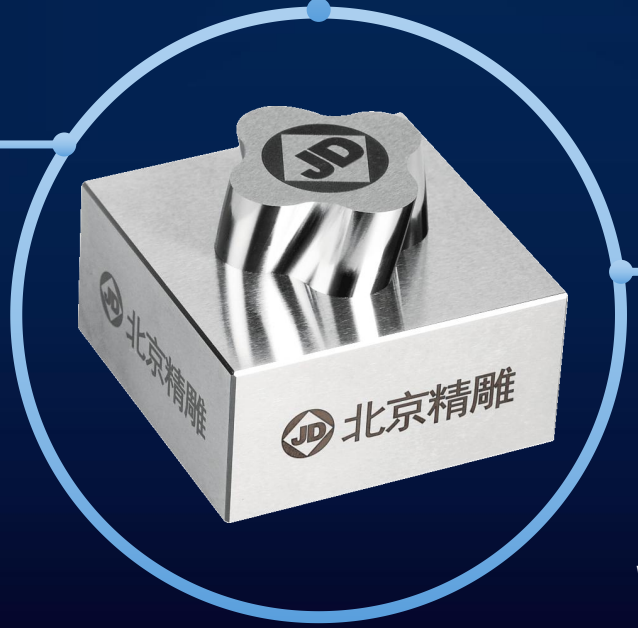
Accurate CNC Machine

Accurate Workpiece Data

Accurate Tool Data



Accurate Workpiece

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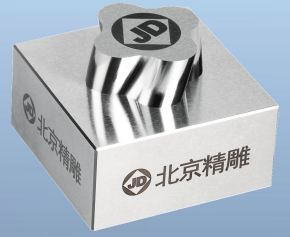
What are the accurate data of workpieces and cutting tools?

Workpiece



- Workpiece origin
- Raw workpiece allowance
- In-process workpiece allowance
- …

Tool

- Tool length and radius
- Tool profile
- Tool wear
- …

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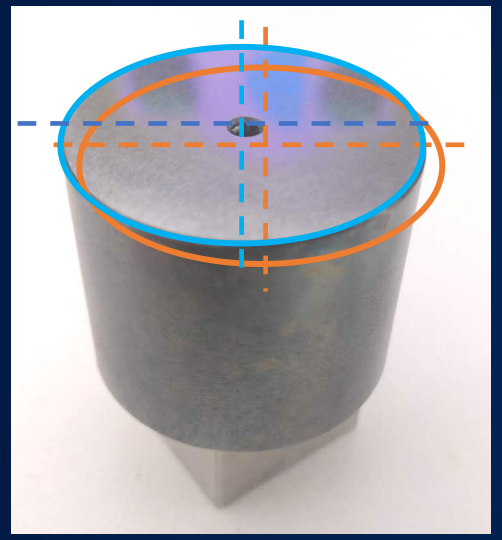
Actual Center

Theoretical Center



Workpiece Orgin Deviation

Actual Tool size

Theoretical Tool size

Tool Size Deviation

Unaccurate workpiece origin and tool size
are typical factors in CNC machining !

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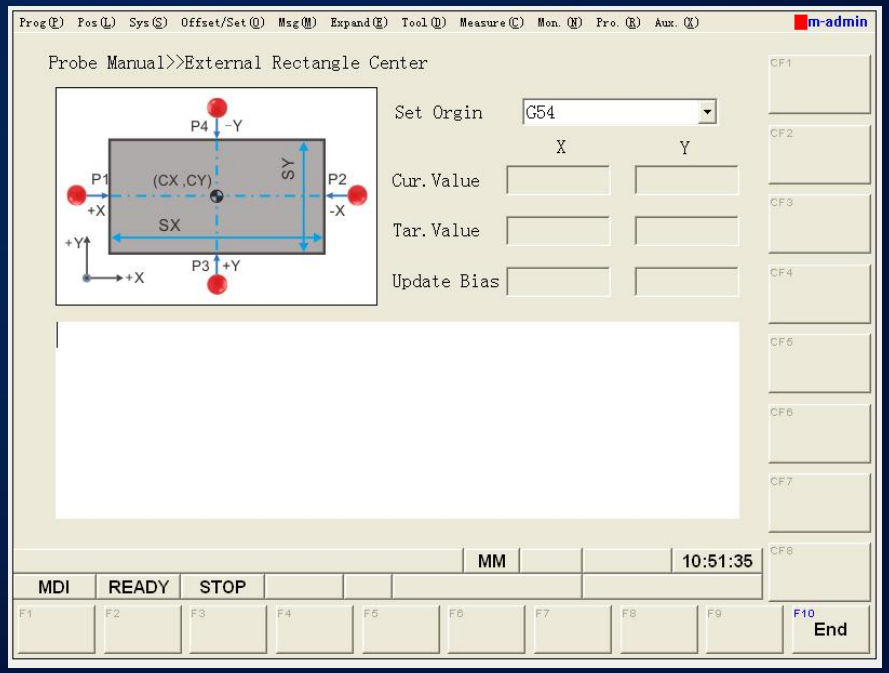
Workpiece Origin Deviation

Dial Indicator

MDI



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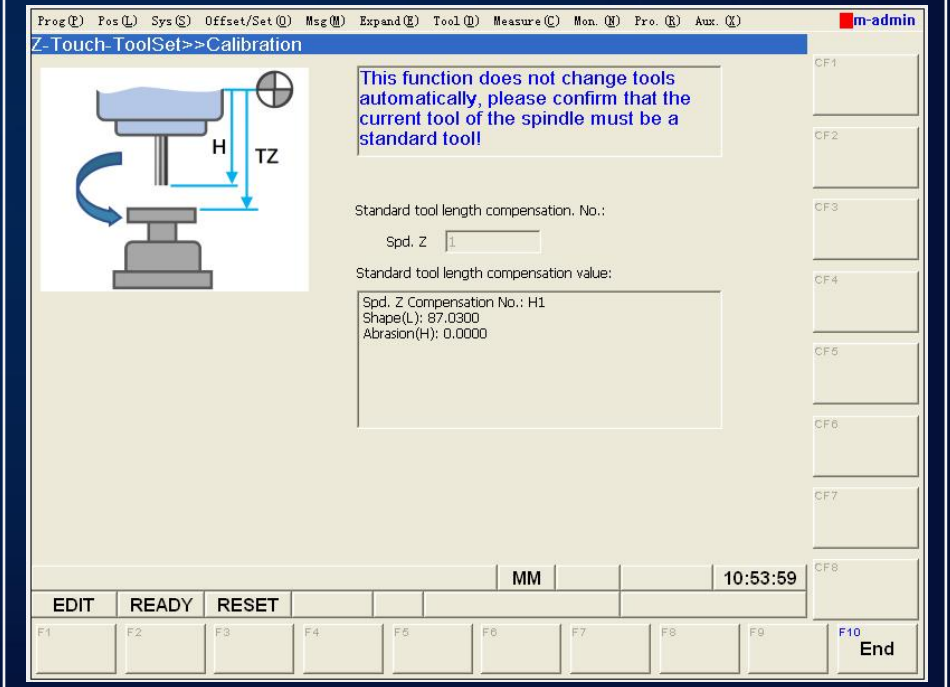
Tool Length Deviation

Trial Cut

MDI



Is there a possible solution

that can obtain the data of workpiece and tools

Fast, Accurately, Intelligently, Automatically,

and compensate the deviation intelligently

in not only 3-axis machine tool but also 5-axis?

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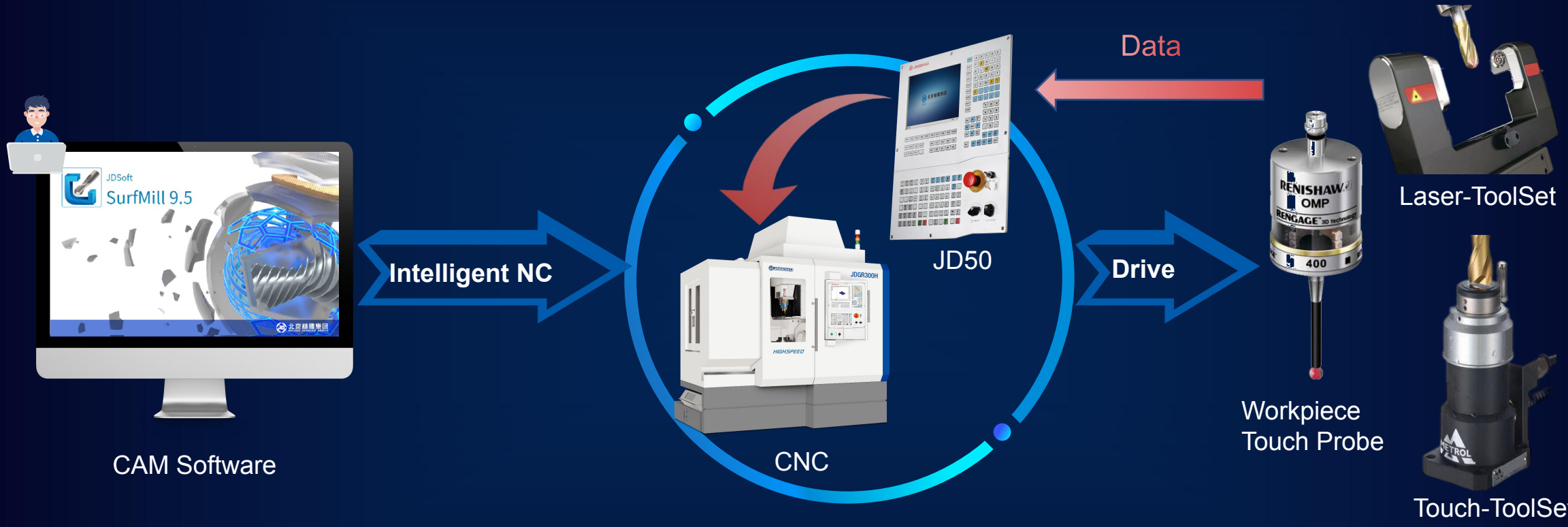
Beijing Jingdiao IMIM



IMIM is developed by Beijing Jingdiao Group, which is a new technology that can obtain accurate data of workpiece and tools in machine, and make compensation intelligently!

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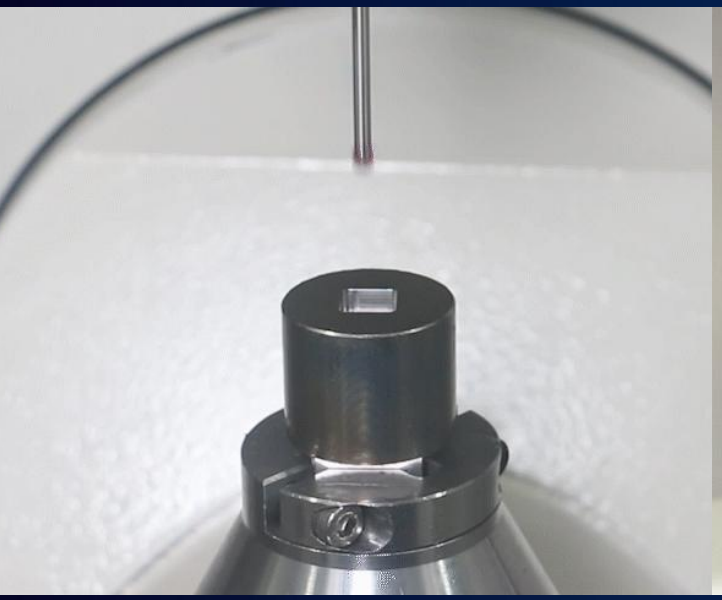
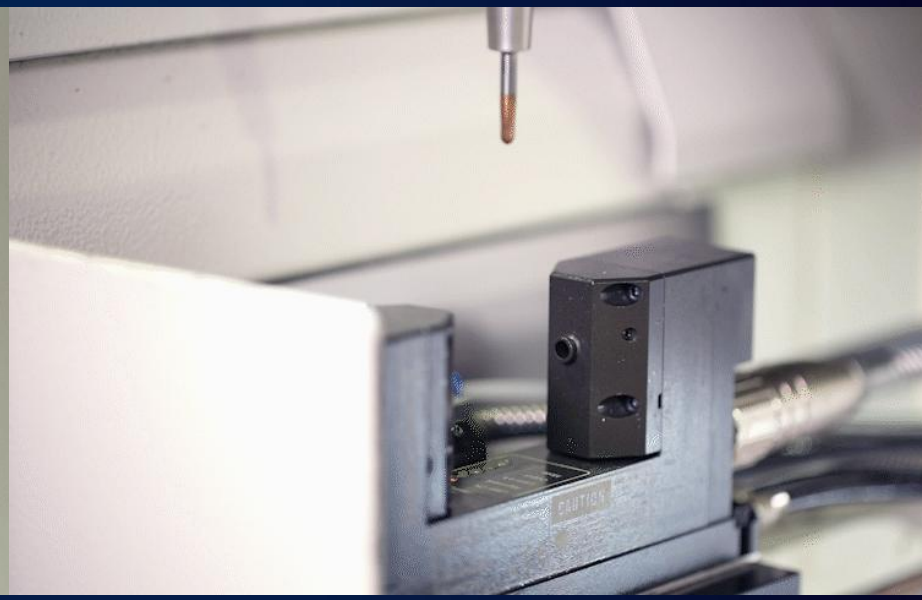
Beijing Jingdiao IMIM



Workpiece Alignment

Surface Allowance Measurement



Tool Profile Measurement

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Application of IMIM

Housing

Size: 239.3*233.3*226.7mm

Material: Al 6061

Key features:

- Dimension tolerance ±5μm
- Axiality ＜15μm

Results:

- Dimension tolerance ±3μm
- Axiality ＜5μm

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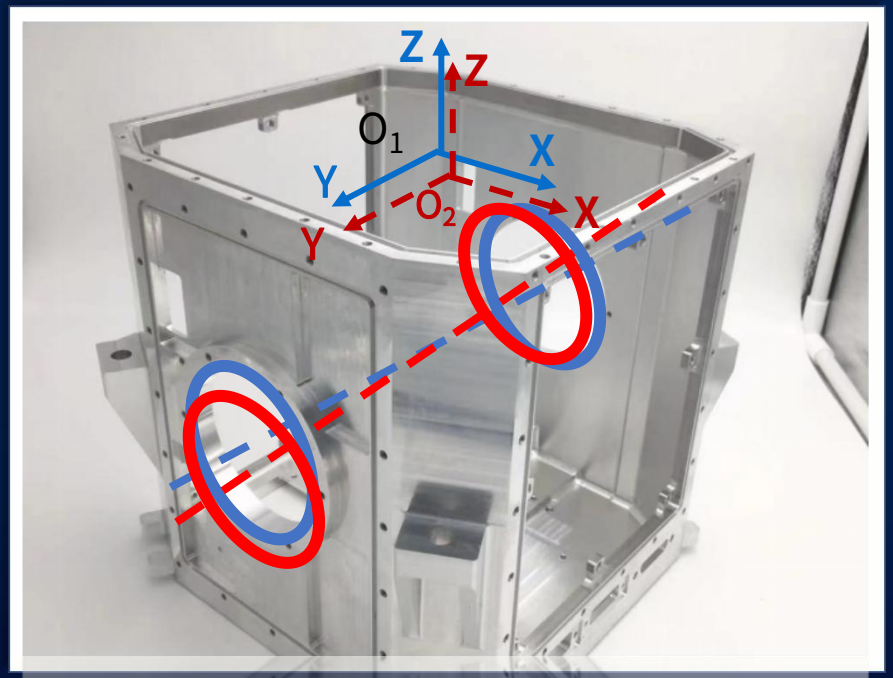
Solution Based on IMIM

1 Origin Set

In 5 axis micron machining, inaccurate origin will enlarge deviation in all directions.



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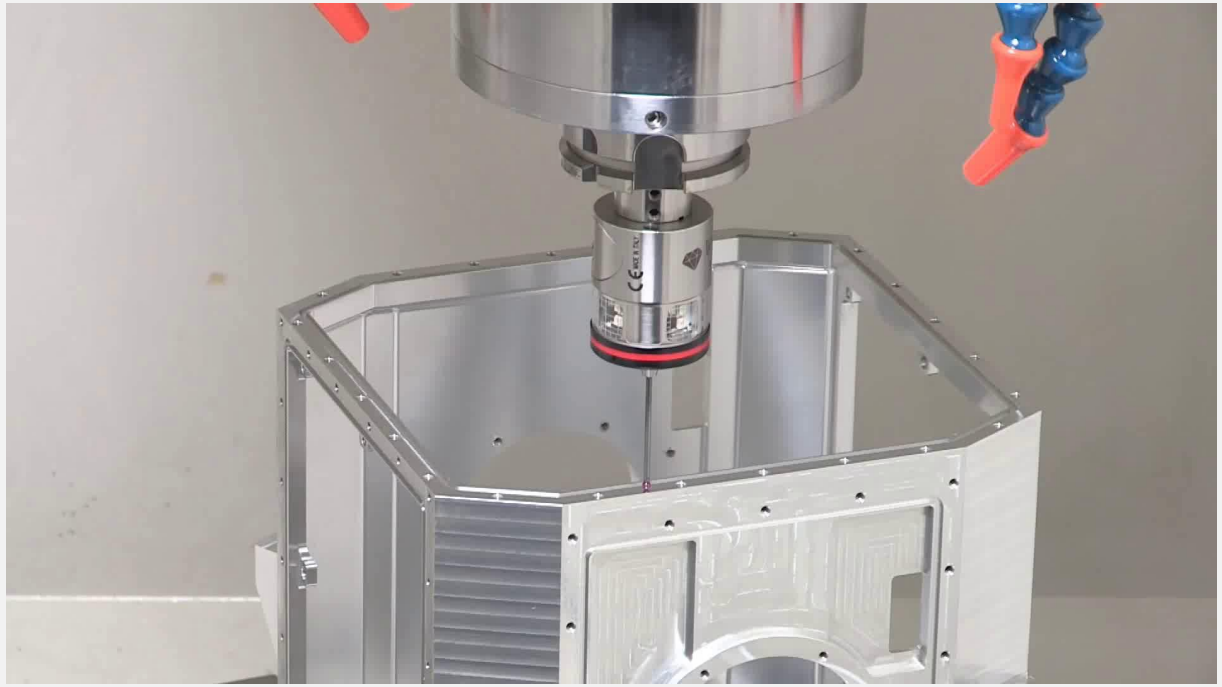
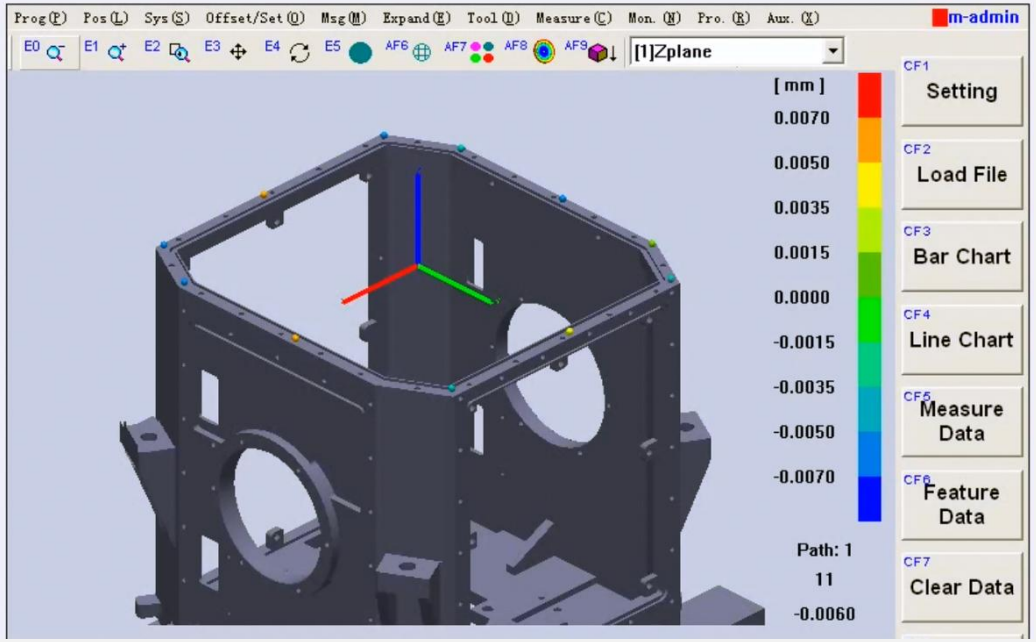
Solution Based on IMIM

1 Origin Set





Calculate and compensate deviation in A, B and Z directions intelligently!

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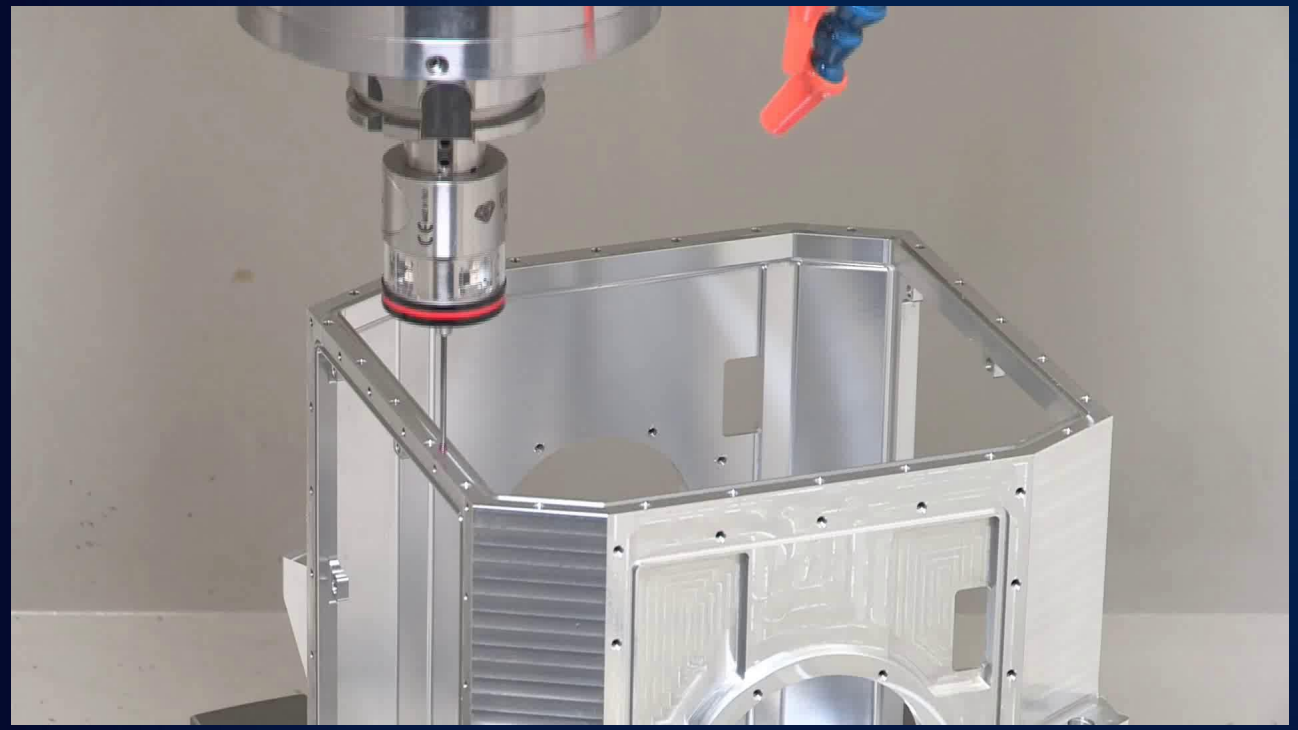
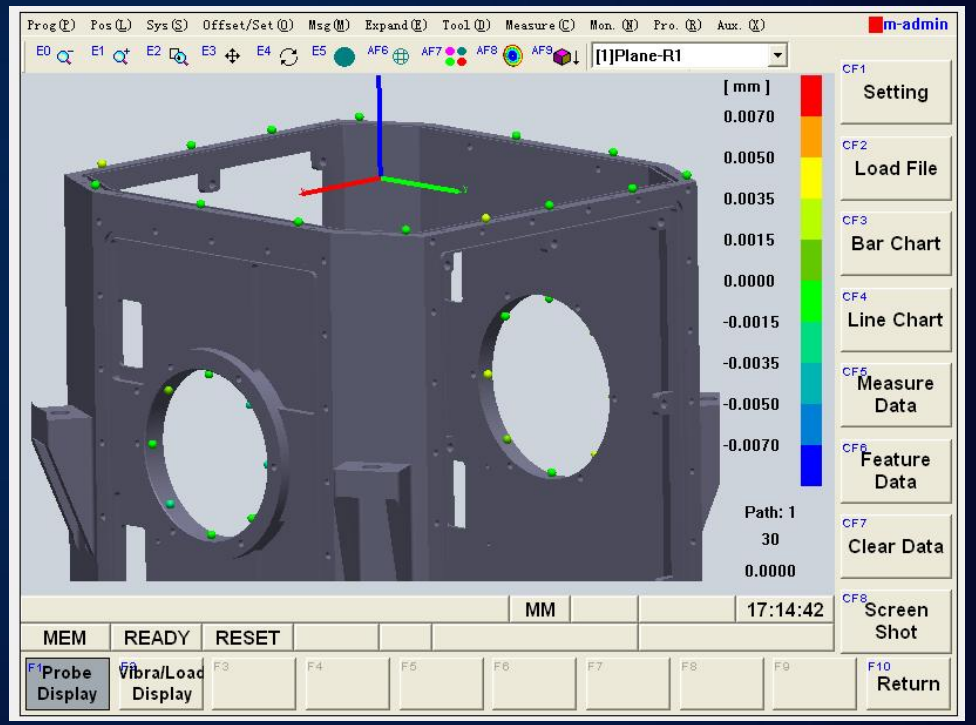
Solution Based on IMIM

1 Origin Set





Calculate and compensate deviation in X, Y and C directions intelligently!

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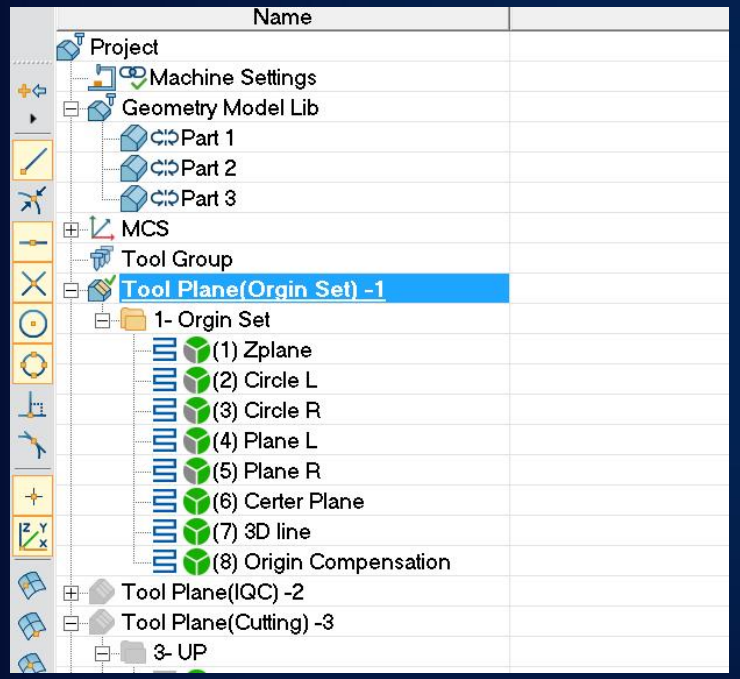
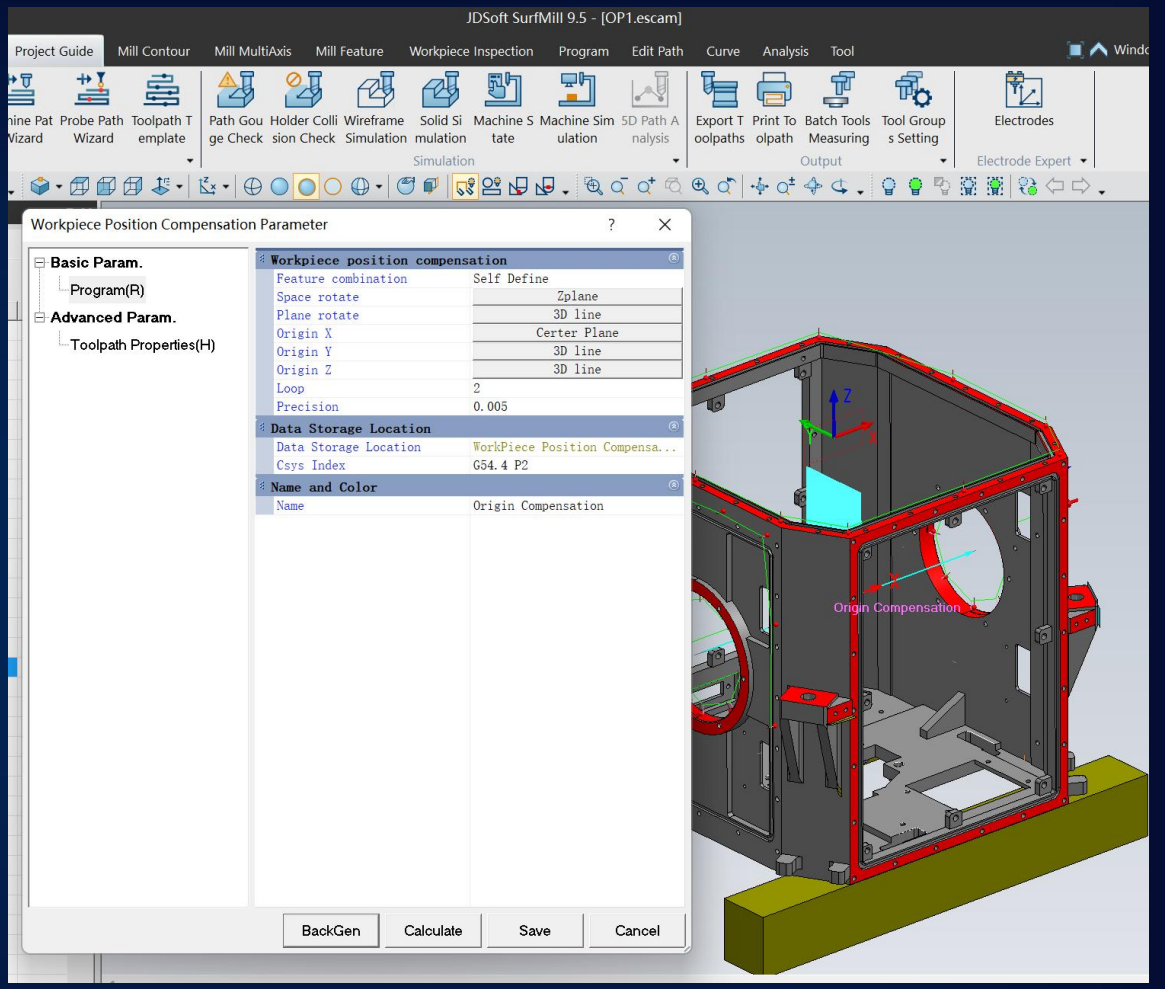
Solution Based on IMIM

1 Origin Set





Measurement program is fully prepared in the CAM software with an user-friendly interface!

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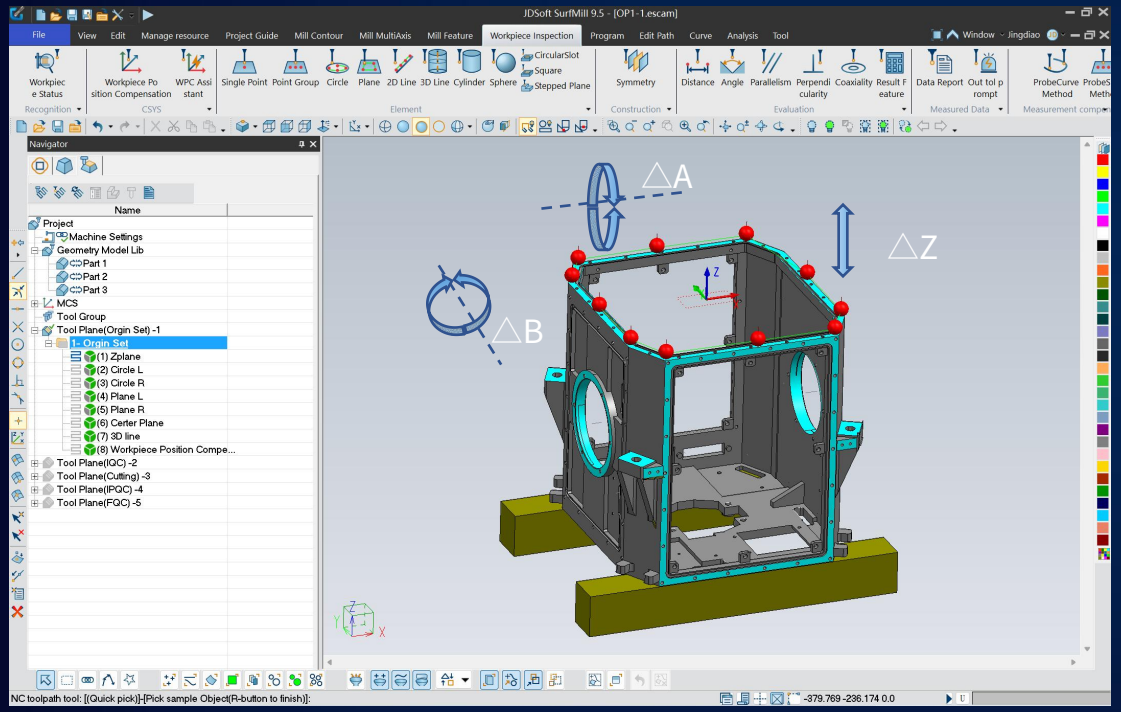
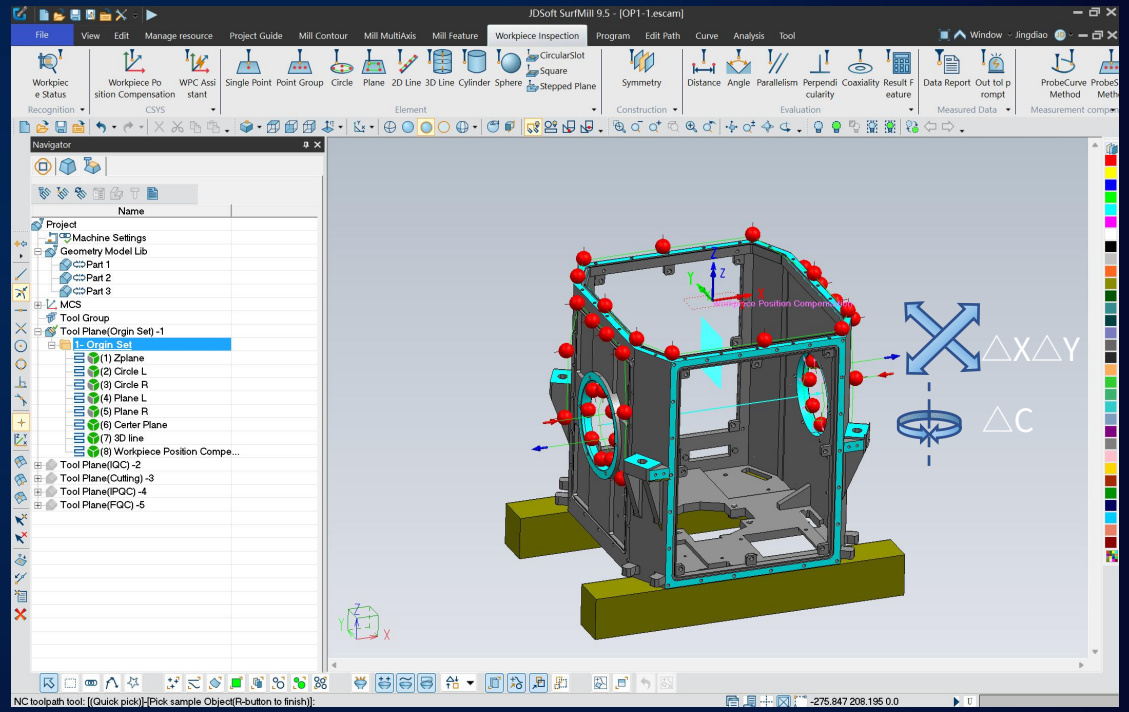
Solution Based on IMIM

1 Origin Set



Set probing points to compensate
△Z, △A and △B



Set probing points to compensate
△C △X and △Y

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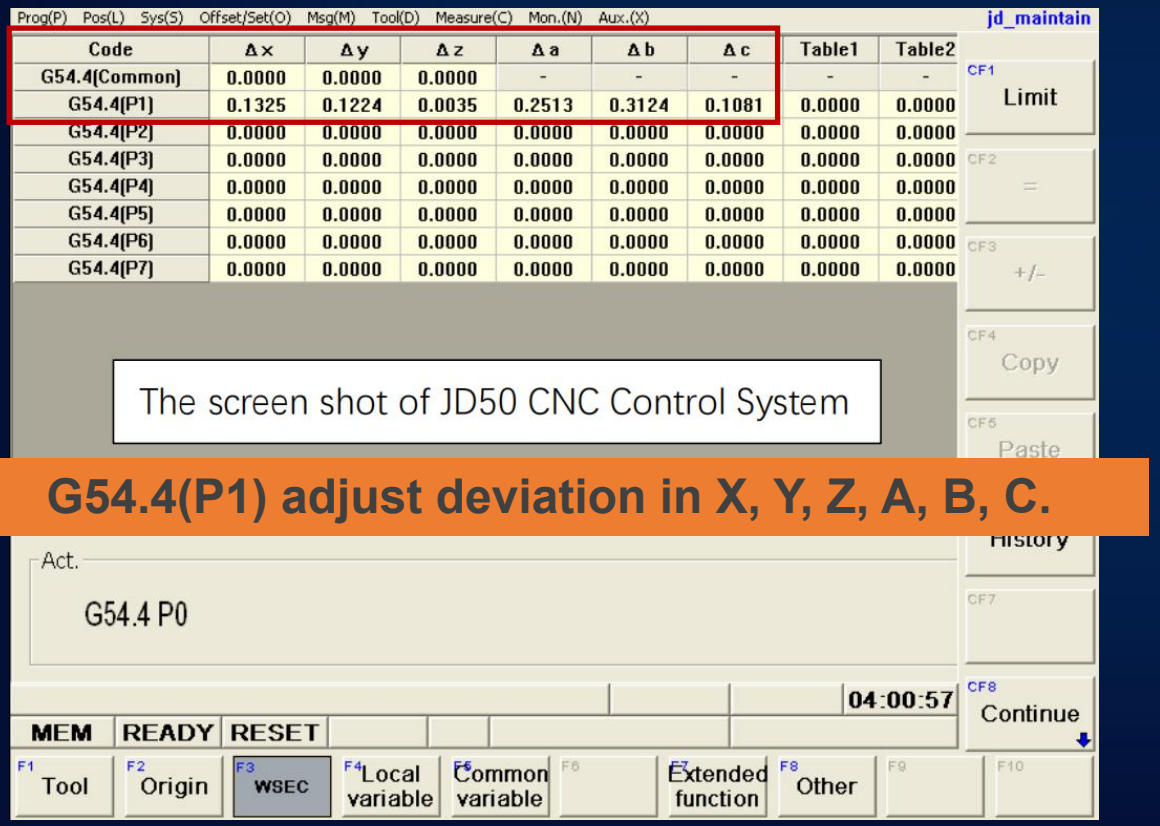
Solution Based on IMIM

1 Origin Set



Intelligently compensate in control system to guarantee accuracy !

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Solution Based on IMIM

2 Tool Measurement

easurement

roperty

Name: Tool Measurement

Selected Macro

No.	Selected Macro
1	O6302(Tool Process Control For Con

Macro

O6302(Tool Process Control For Contact Device)

Basic Parameters

- Check Tool Before Mill
- Device Required Popup
- F: 1:Flat End — Tool Type
- H: 30 — Tool Length
- K: U1:Update tool shape length(L),clear wear compensation(H)(H = 0.0) — Operate Mode

Parameters of Tool Clamping and Ware Meaurement

- Allow to Check Tool Length
- I: 199 — Tool Length
- C: 5.0 — Tool Length Tolerance
- Allow to Check Length Wear
- J: 0.01 — Tool Length Wear Tolerance

Spindle Preheating Parameters

- Fixed Time Preheating
- A: 5 — Spindle Dwell Time: Min
- B: 9000 — Spindle Speed

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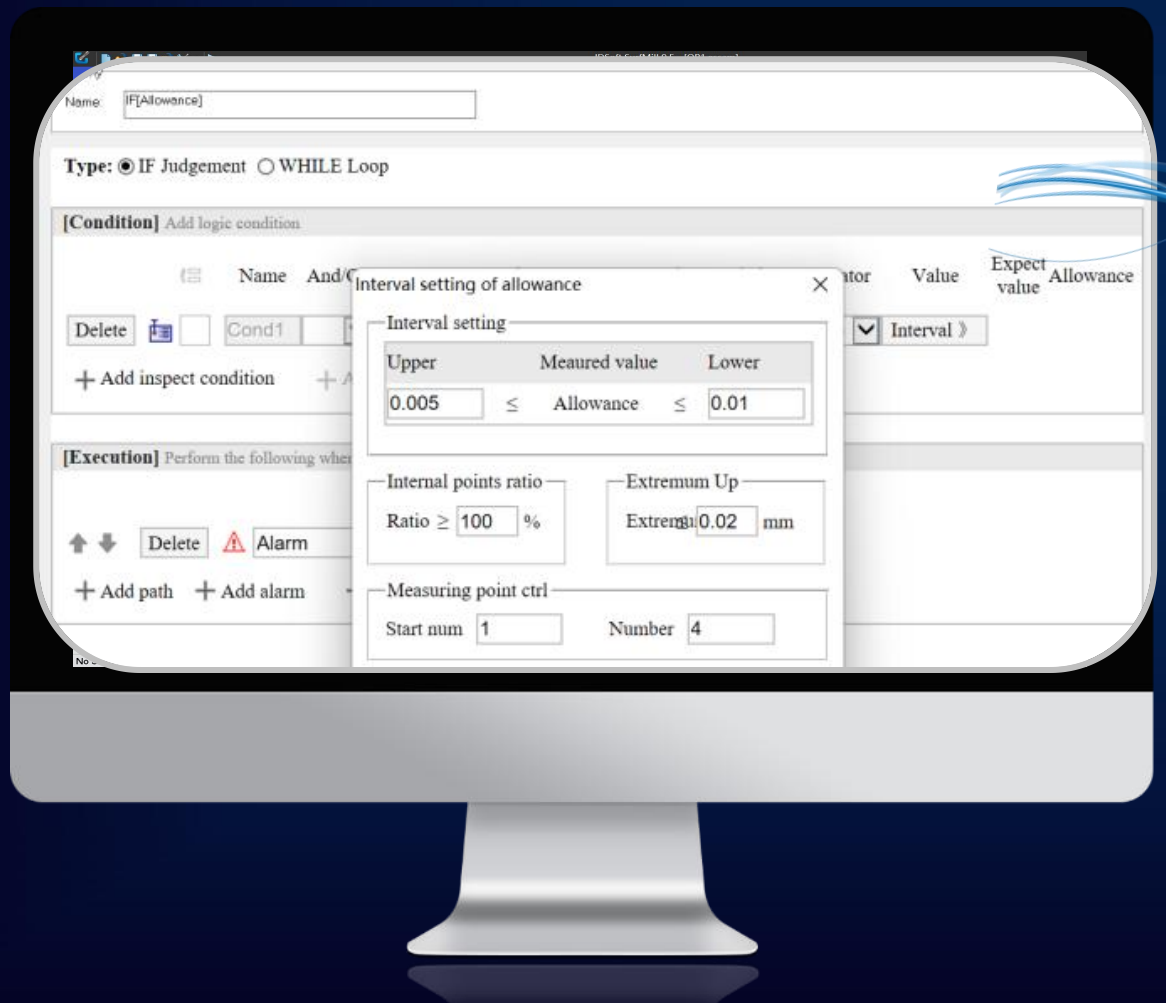
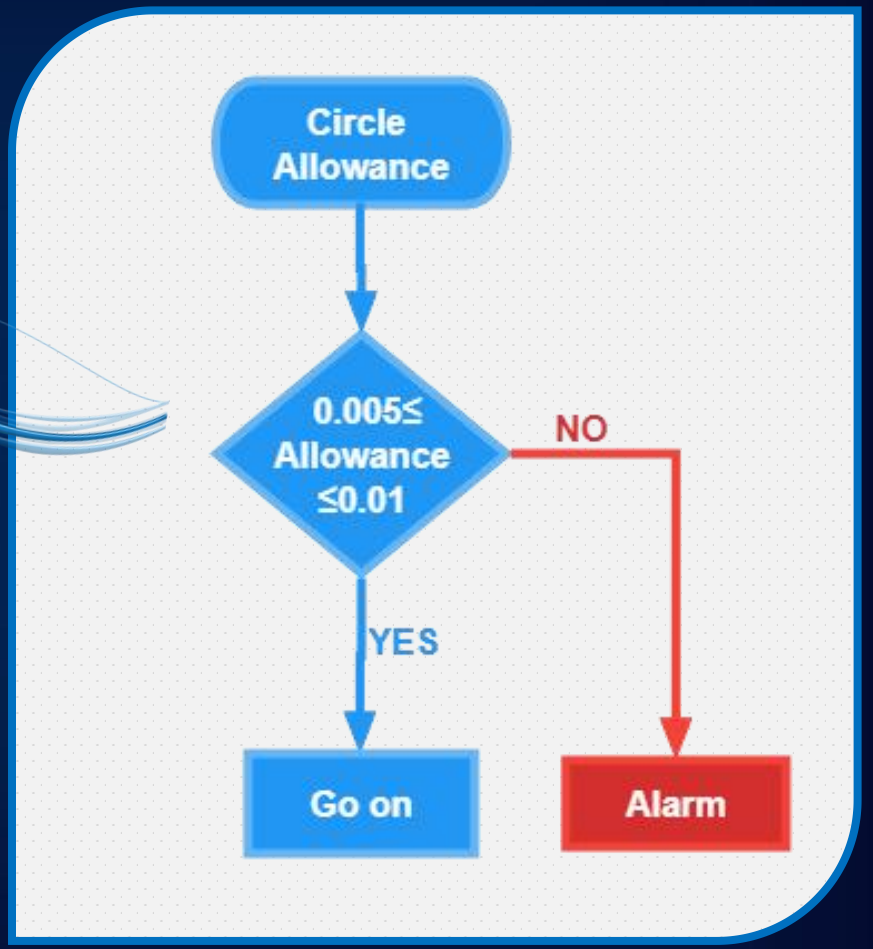
Solution Based on IMIM

3 Incoming Quality Control





Automatically judge workpiece quality !

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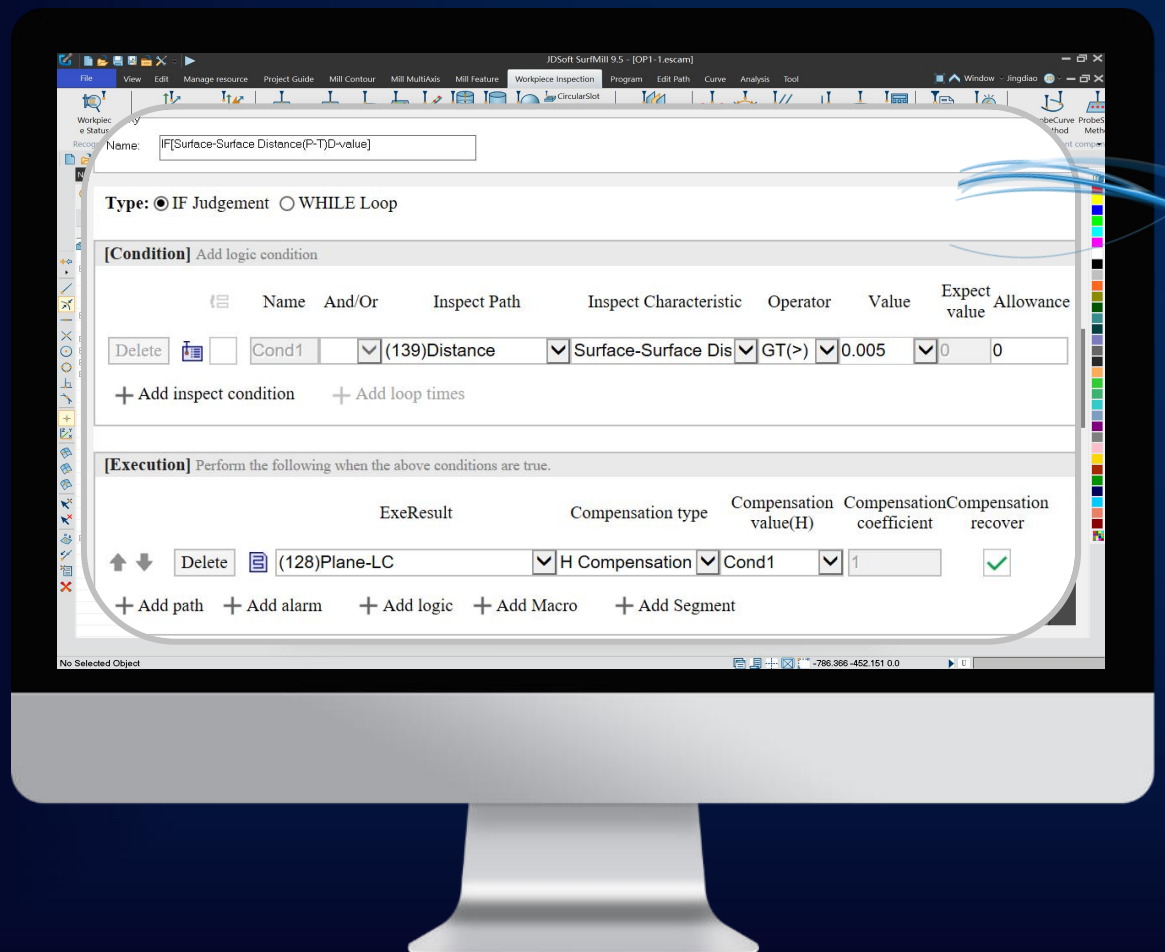
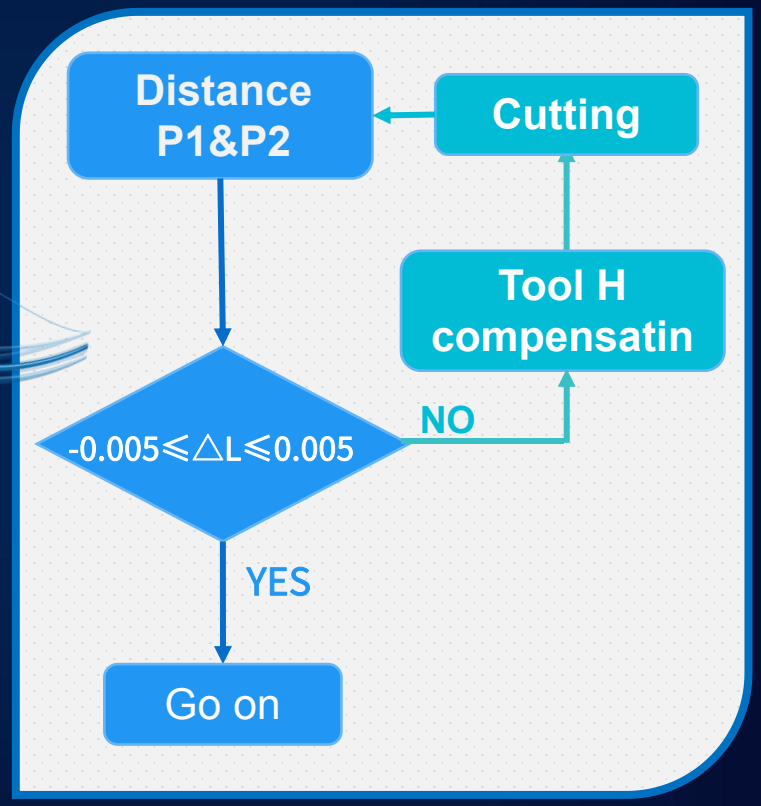
Solution Based on IMIM

4 In-Process Quality Control





Measurement and compensation in real-time !

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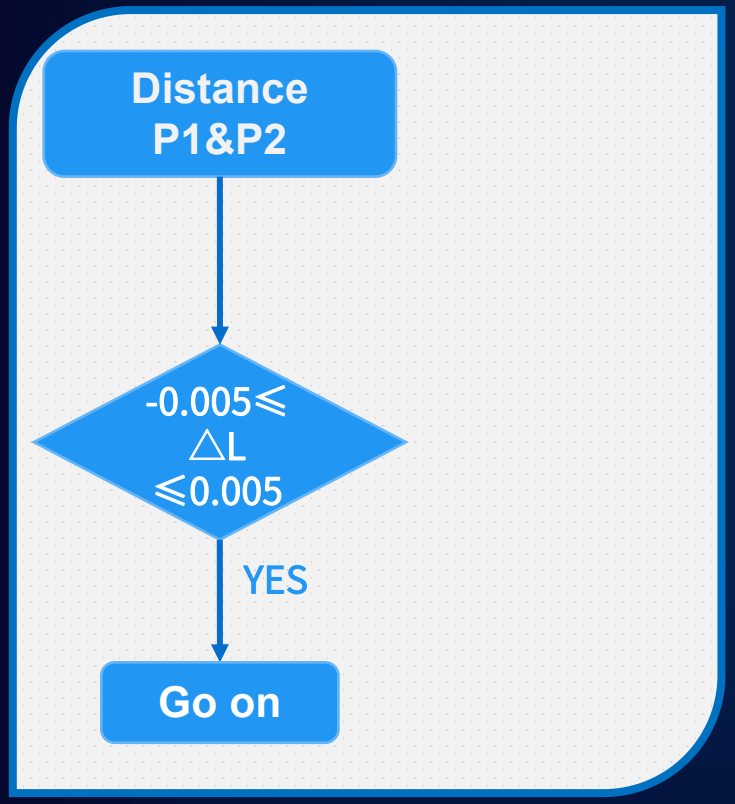
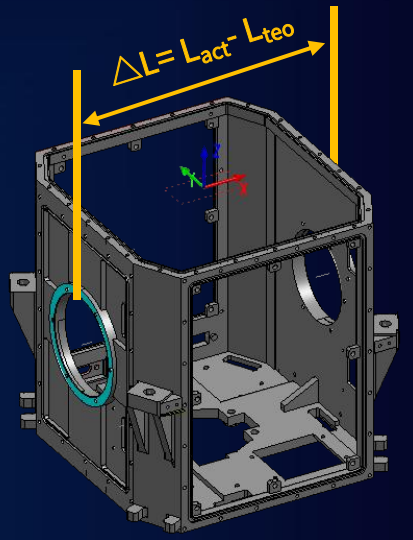
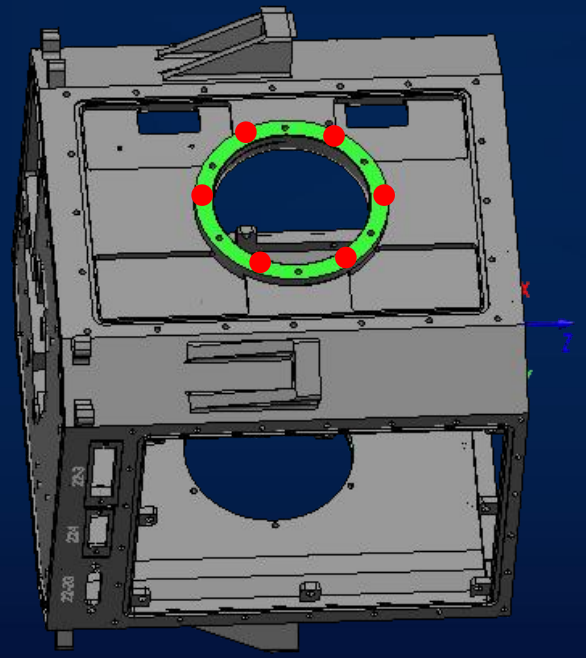
Solution Based on IMIM

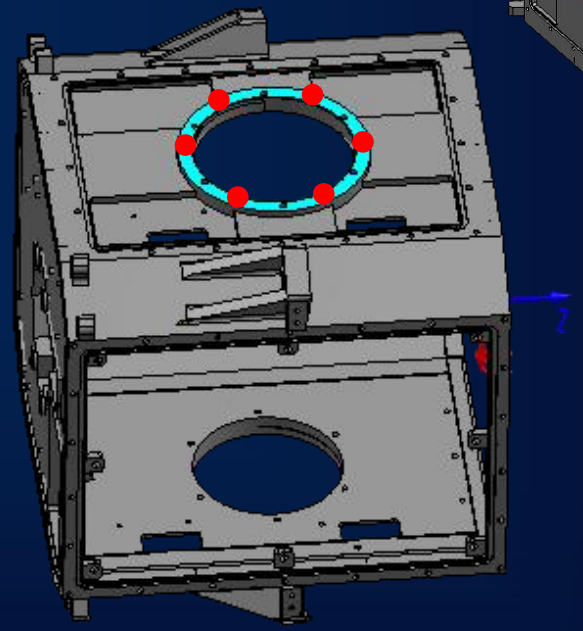
4 In-Process Quality Control







Right



Left

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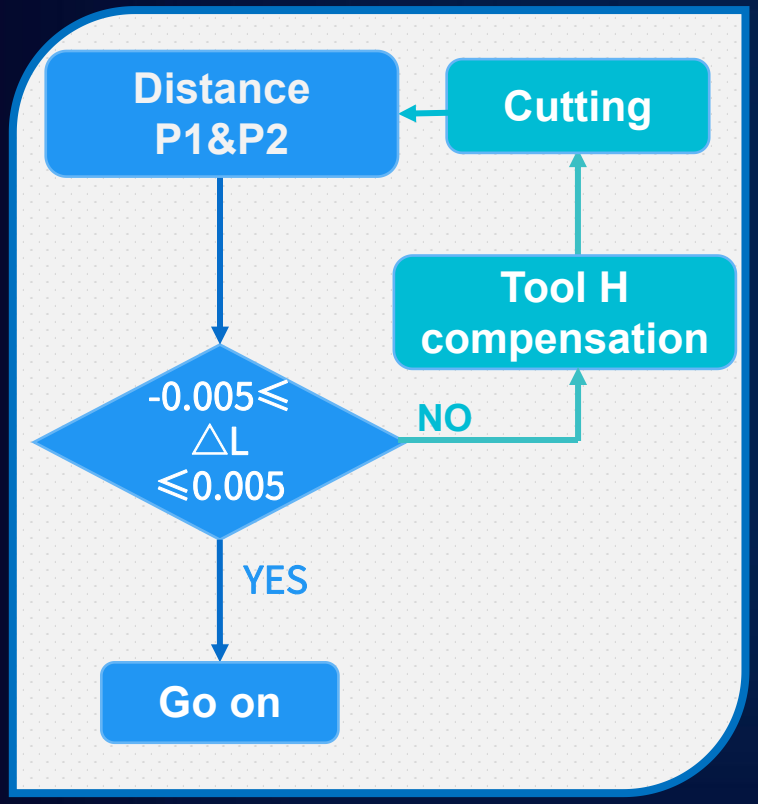
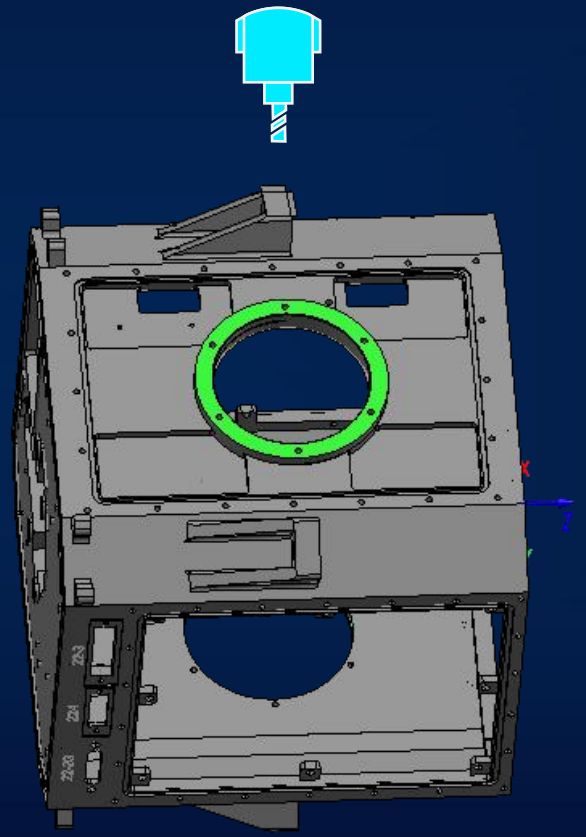
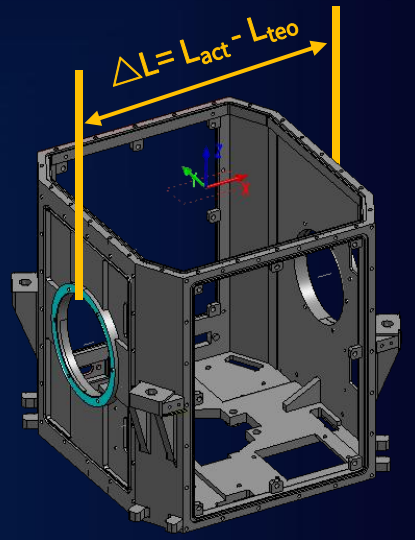
Solution based on IMIM

4 In-Process Quality Control





Right



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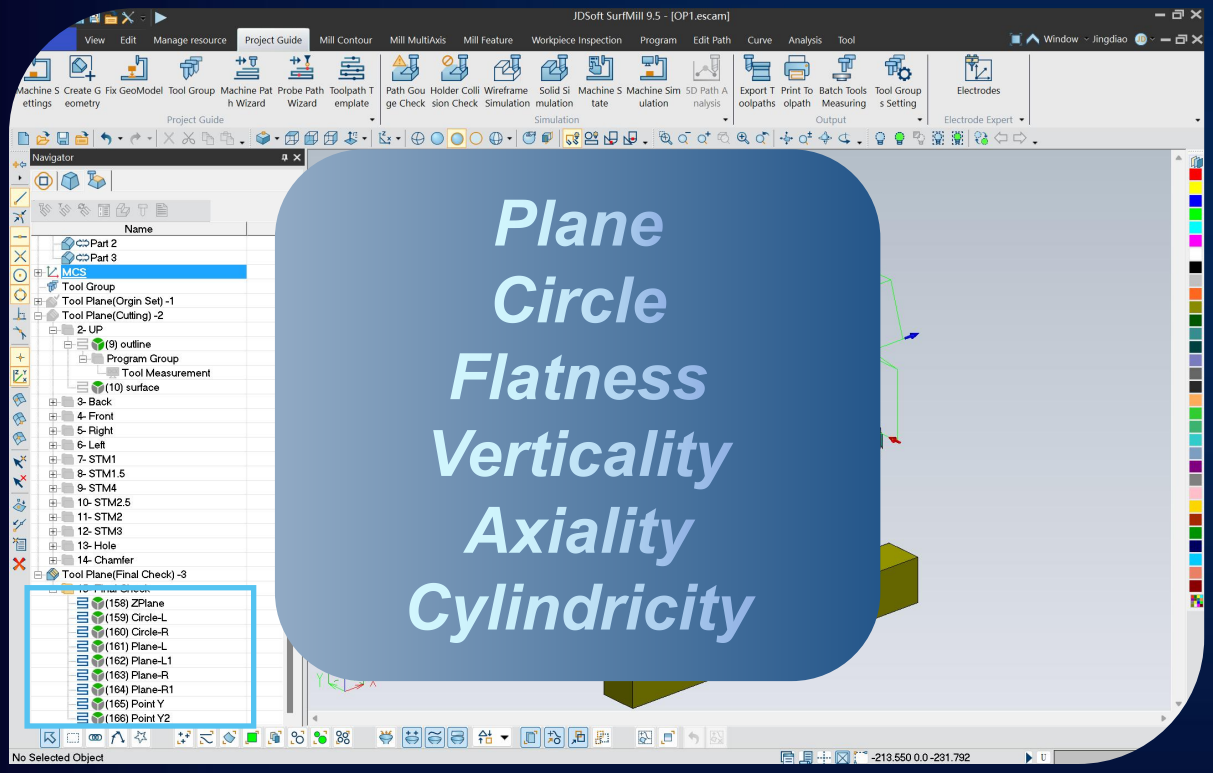
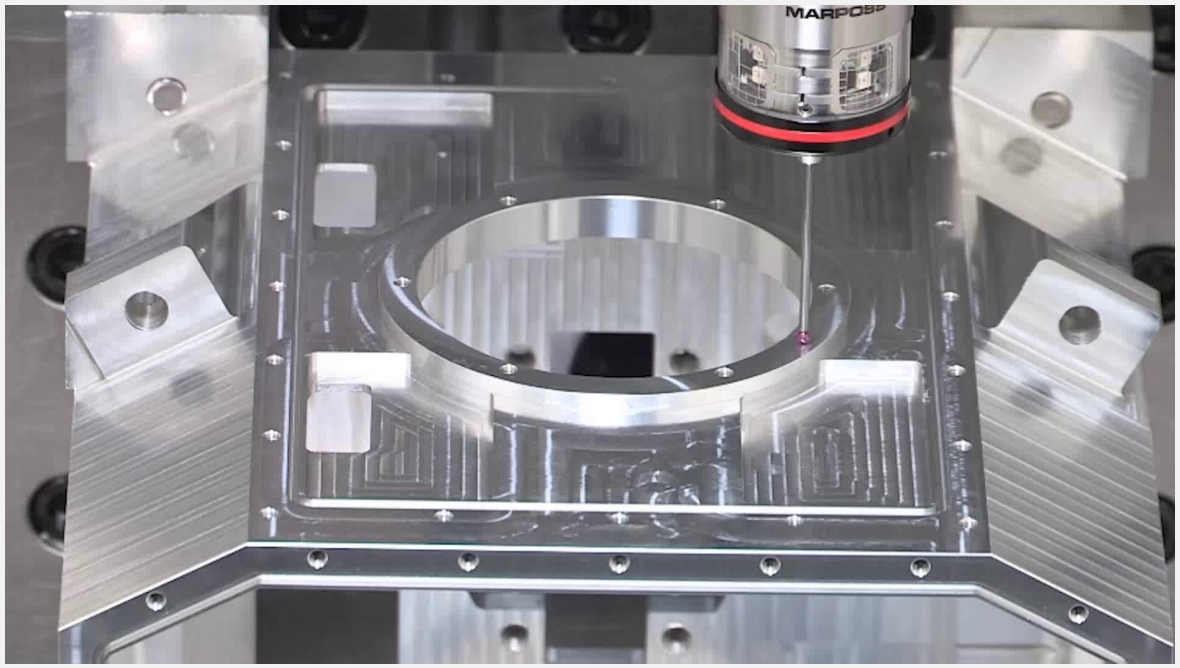
Solution Based on IMIM

5 Finished Quality Control





In-machine measurement, no part transmission !

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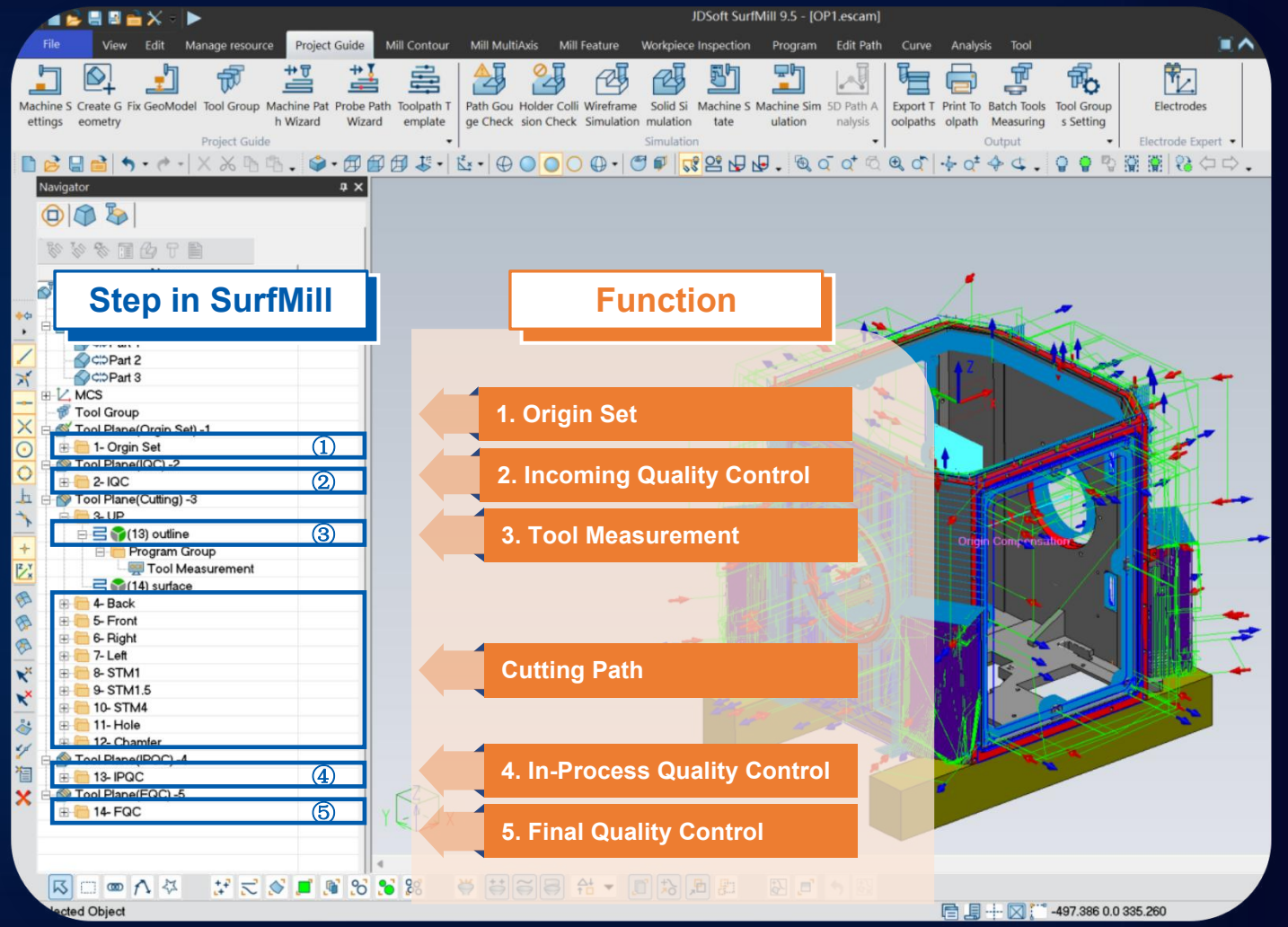
Intelligent NC program generates in SurfMill supports the whole process!

Solution based on IMIM



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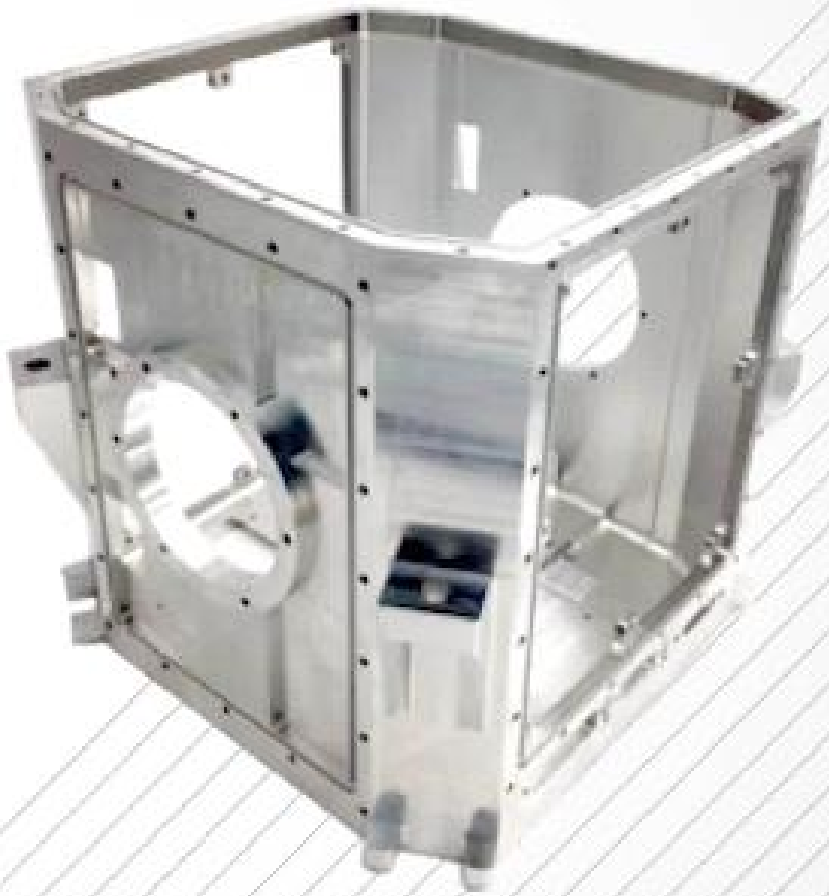
Housing

Machine: JDMR600

Material: Al 6061

Size: 239.3×233.3×226.7 mm



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Mirror Surface Measurement

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Eggshell Machining

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5-Axis Alignment Experiment

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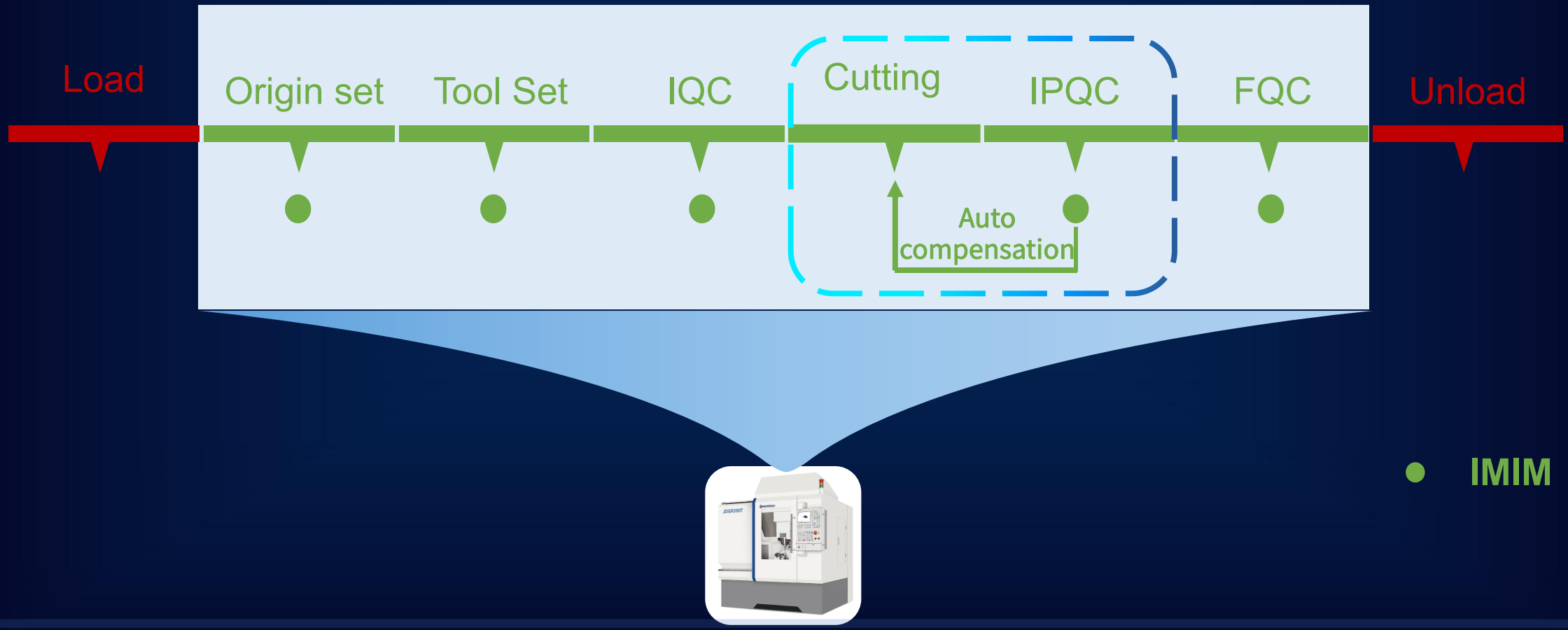
In-Machine Automation Based on IMIM !

No Human-Machine Interation with IMIM



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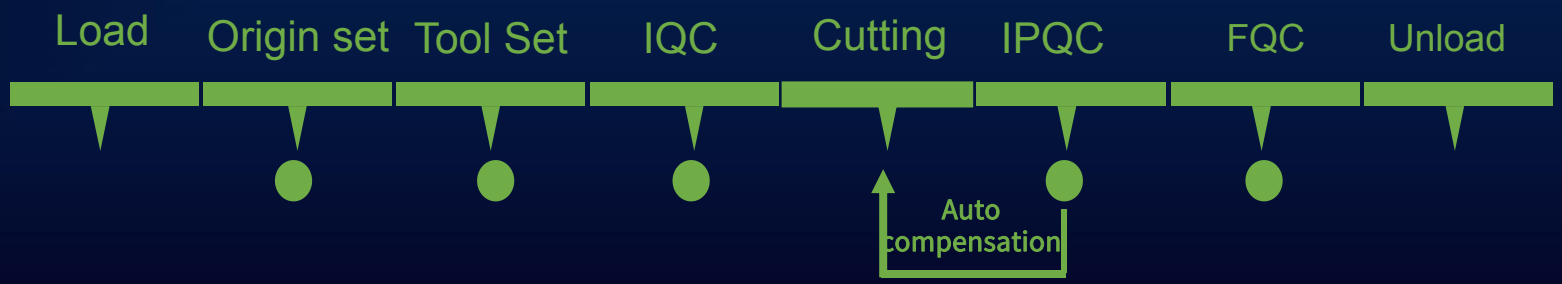
Automatic part loading, unloading with JDFMS.



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Dark factory is possible by introducing IMIM+JDFMS

You can sleep well!

Enjoy life!

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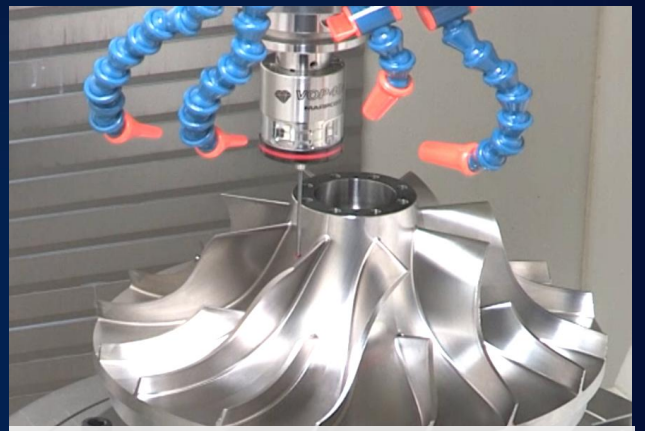
Industries

Electronics

Automotive



Turbo Machinery

Mechanical Parts

Medical

Tools and Mold

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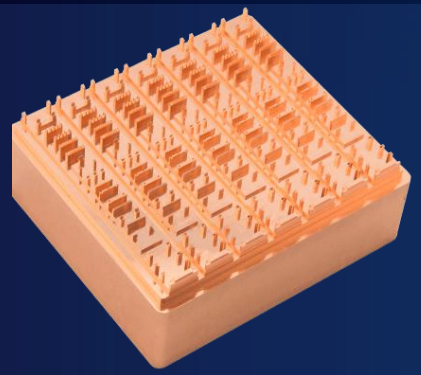
Different materials

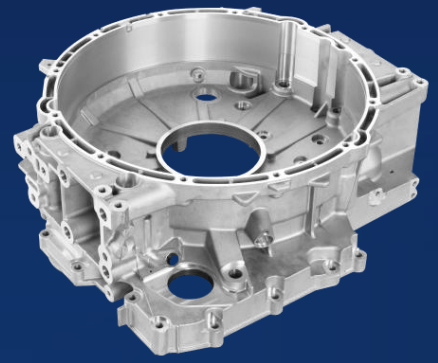


Connector Mold Electrode

Materials: Copper

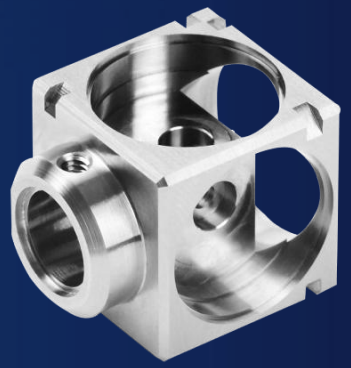
HUD Mirror Mold Part Test Piece

Materials: M333(HRC50)



Flywheel Housing Die Casting

Materials: Cast Aluminum(ADC12)

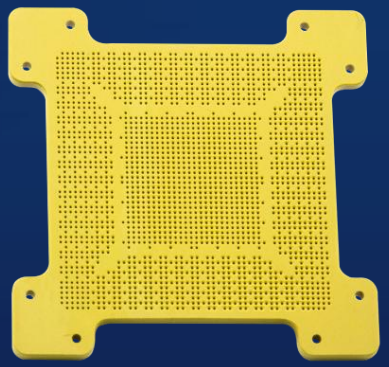


Camera Module Parts

Materials: Titanium Alloy

Zirconia Ceramic Watch Case

Materials: Alumina Ceramic



Pinhole Plate Test Piece

Materials：Nylon

Graphite Electrode

Materials：Graphite(SGL8650)

Glass-Ceramic Aspherical Lens

Materials：Glass-Ceramic

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Customers

MicroPort微创

LESSO联塑

BEST

FOXCONN

BOSCH

SAMSUNG

DECANS 德康医疗

MGL

大博医疗 DOUBLE MEDICAL

mindray

Midea

FerroTec

...

Knowledge Sharing Centre

Manufacturing Technology Conference 2023

北京精雕集团 BEIJING JINGDIAO GROUP

Warmly welcome to visit our booth!

IMIM is here!

BOOTH NUMBER: 46