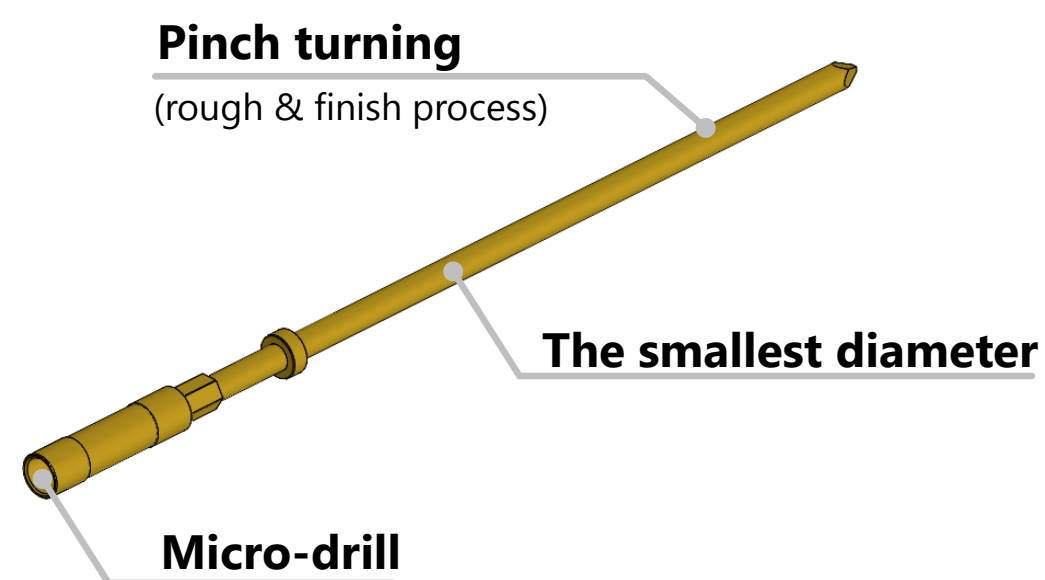


Cincom's answer for machining ultra-small-diameter precision components

Demonstration Workpieces

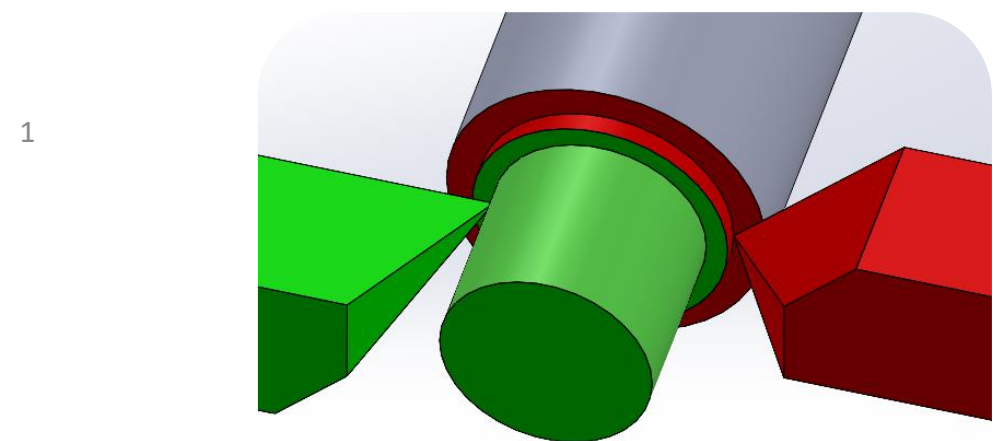
Contact pin / Semiconductor



Highlight machine

Pinch turning (Balance cutting)

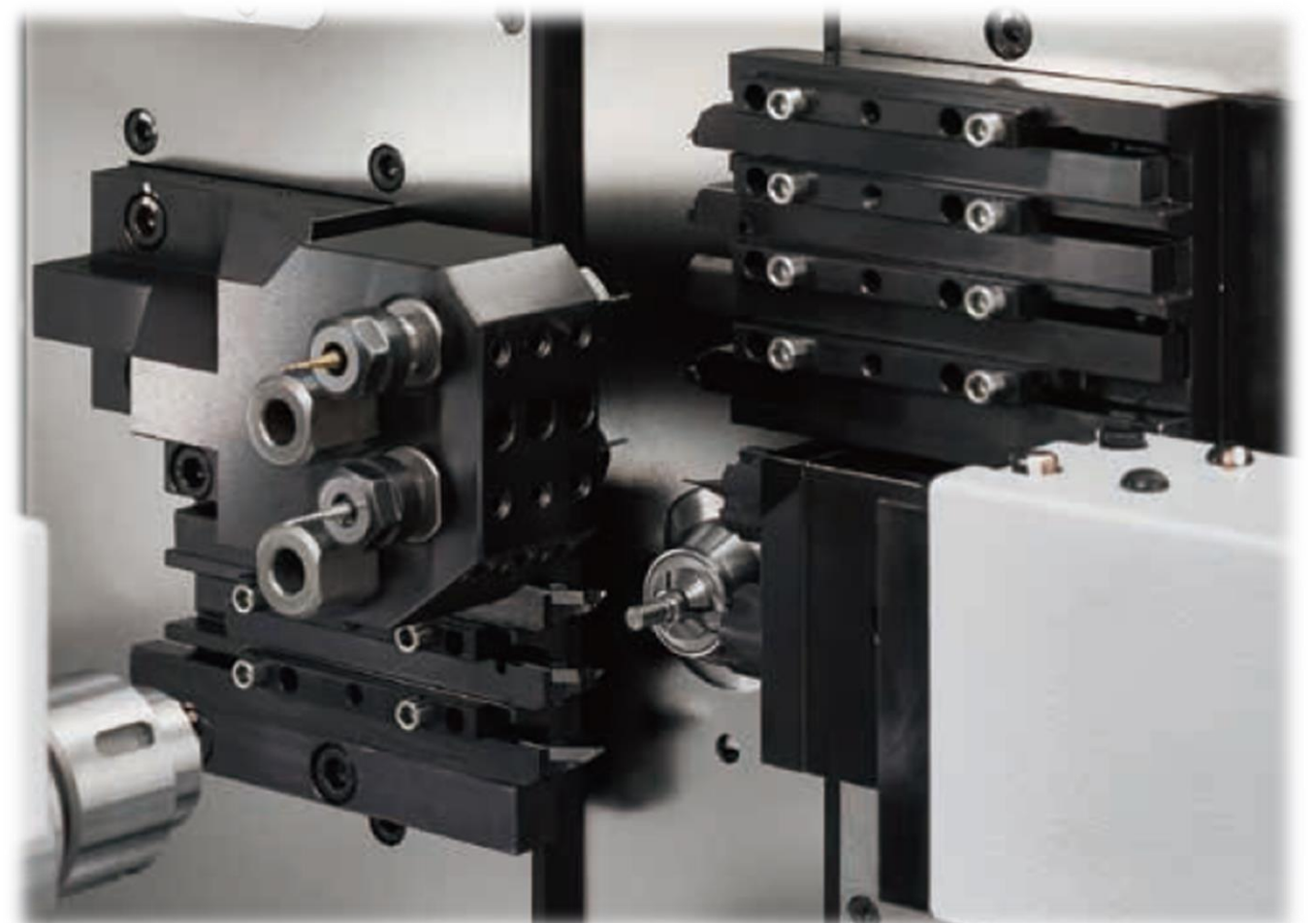
Small workpieces often facing with **material bending** problem perform in long cutting process.



Balance cutting is used to reduce this problem. Another important benefit is reduces cycle time by performing rough and finish cutting processes simultaneously

One-hit machining checklist

- ✓ Main spindle (Max 4(7)mm Dia./ 20,000 RPM)
- ✓ Back spindle (Max 4(7)mm Dia./ 20,000 RPM)
- ✓ Turning tool
- ✓ Rotary tool (Cross)
- ✓ Simultaneous machining 4 axis (X,Y,Z,C)



For more information

- Machine Catalog
- CMAP2024 document

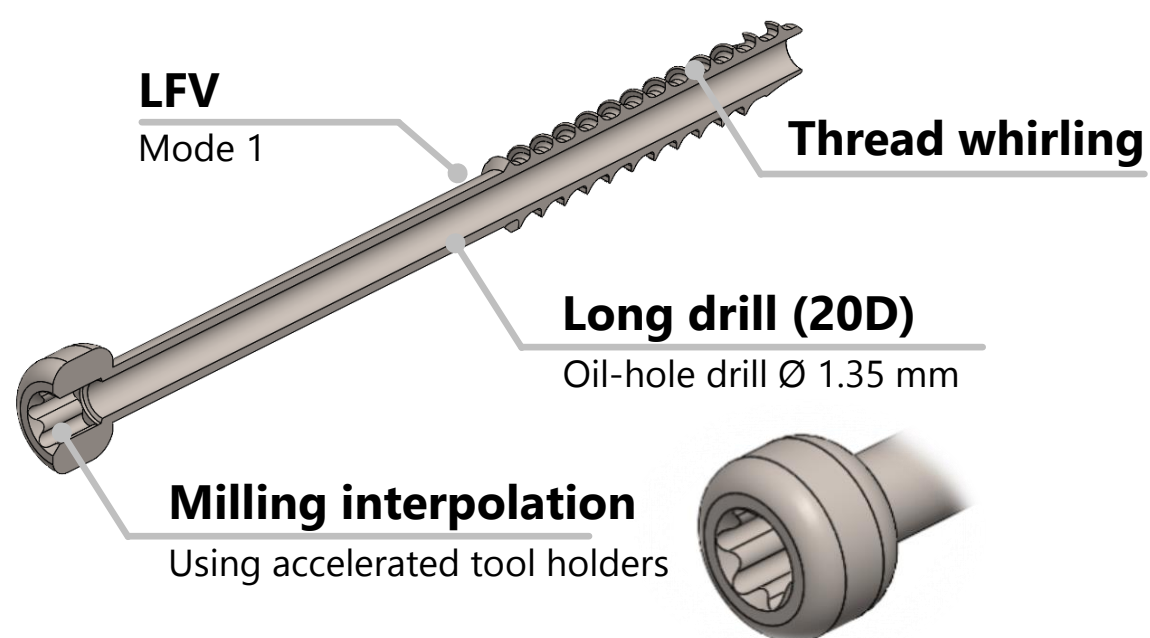


SCAN ME

Modular Tooling System Adopted and Y2 Axis Equipped for Greater Functionality

Demonstration Workpieces

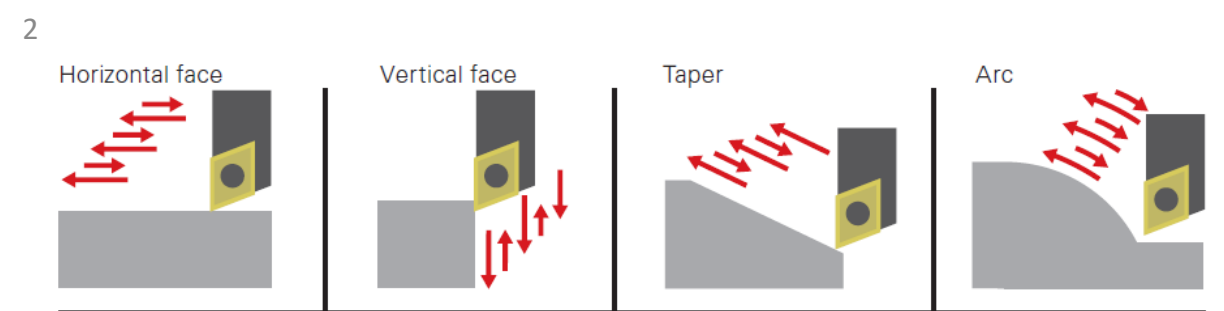
Orthopedic Screws / Medical



Highlight machine

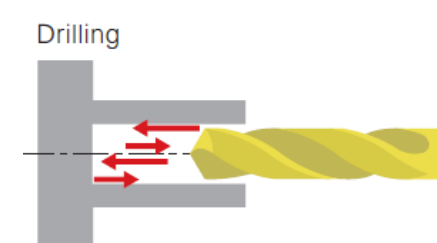
LFV (Low frequency vibration)

The servo axes are vibrated in the axial direction using a unique control technology where by cutting is performed while synchronizing this vibration with the rotation of the spindle



Mode 1: Turning and drilling

Define the number of vibrations per workpiece rotation

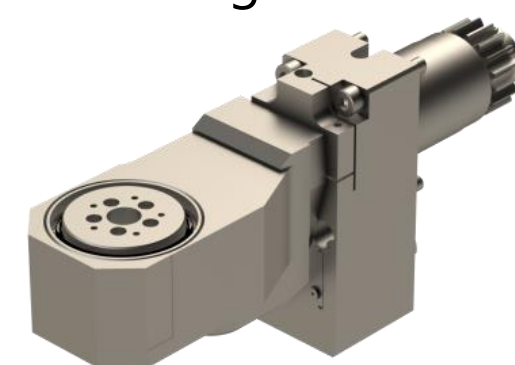


One-hit machining checklist

- ✓ Main spindle
(Max 12(16)mm Dia./ 15,000 RPM)
- ✓ Back spindle
(Max 12(16)mm Dia./ 12,000 RPM)
- ✓ Turning tool
- ✓ Rotary tool (Cross)
- ✓ Simultaneous machining 4 axis
(X,Y,Z,C)

Thread whirling

Thread cutting that have **single pass** for cutting which reduce cycle time, cutting load less than conventional thread cutting



Accelerated tool holders

Normally, Swiss machine have limit speed of rotary tool. So PCM tool create product for response small_tool that need to use high-speed cutting condition.



For more information

- Machine Catalog
- CMAA2024 document



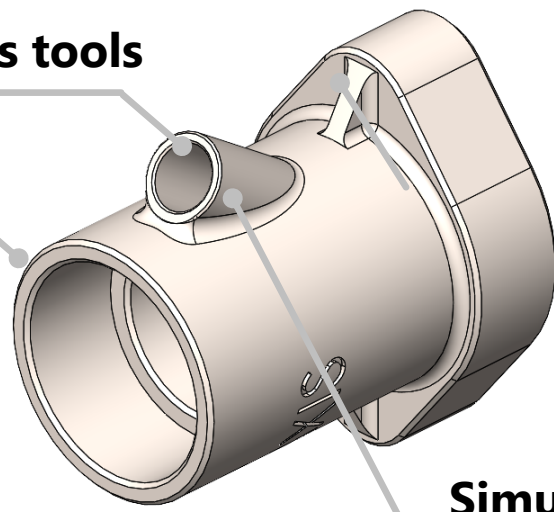
Stable, powerful, and highly productive with versatility of modular design

Demonstration Workpieces

Housing body / Oil & Gas

Drilling using B-axis tools

LFV
Mode 1

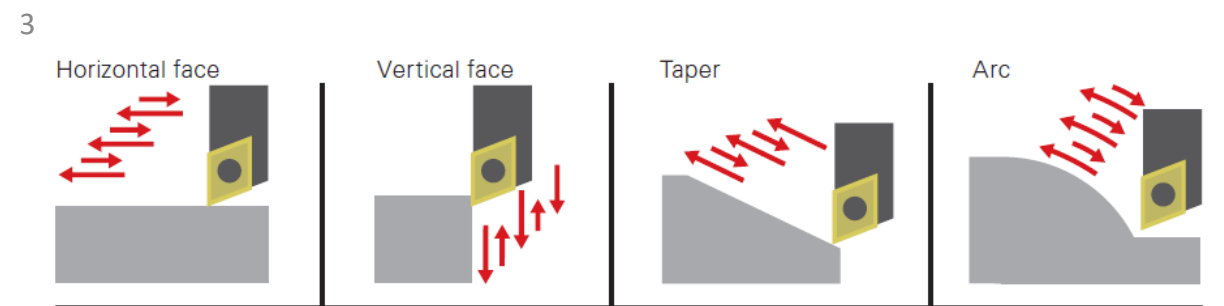


Simultaneous machining
4+1 Axis

Highlight machine

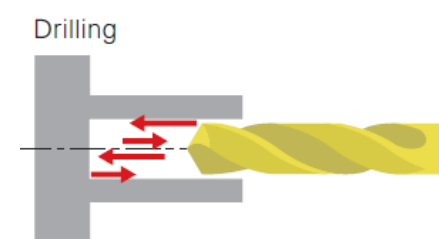
LFV (Low frequency vibration)

The servo axes are vibrated in the axial direction using a unique control technology where by cutting is performed while synchronizing this vibration with the rotation of the spindle



Mode 1: Turning and drilling

Define the number of vibrations per workpiece rotation

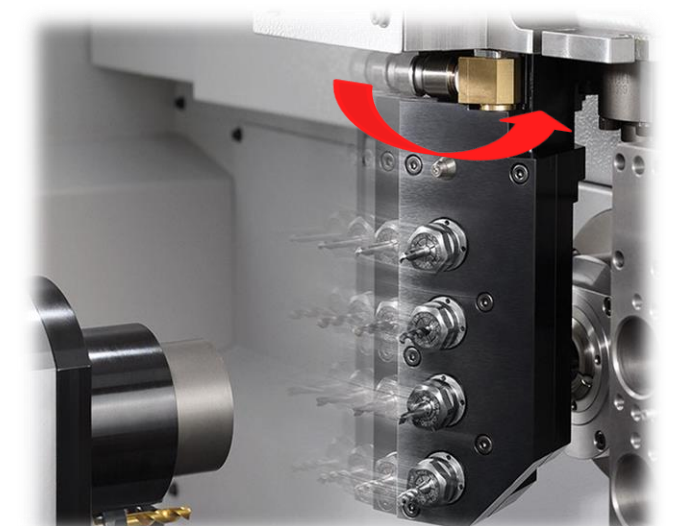
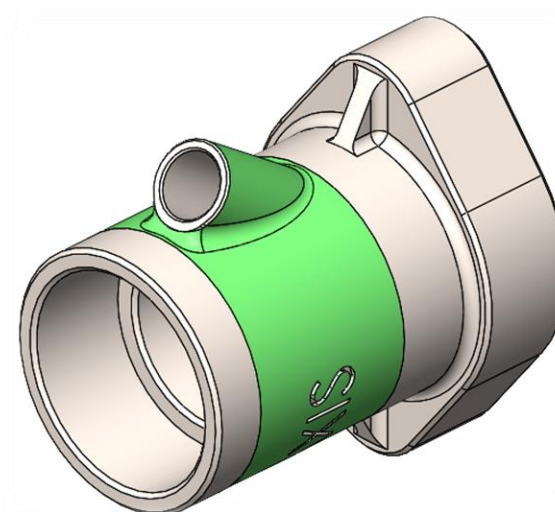


One-hit machining checklist

- ✓ Main spindle
(Max 20(25)mm Dia./ 10,000 RPM)
- ✓ Back spindle
(Max 20(25)mm Dia./ 10,000 RPM)
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 4+1 axis
(X,Y,Z,C,B)

Simultaneous machining with B Axis

Contour machining with 4-axis interpolation (X, Z, C, B) is possible. Programming for contour machining requires use of a third-party CAM system.



For more information

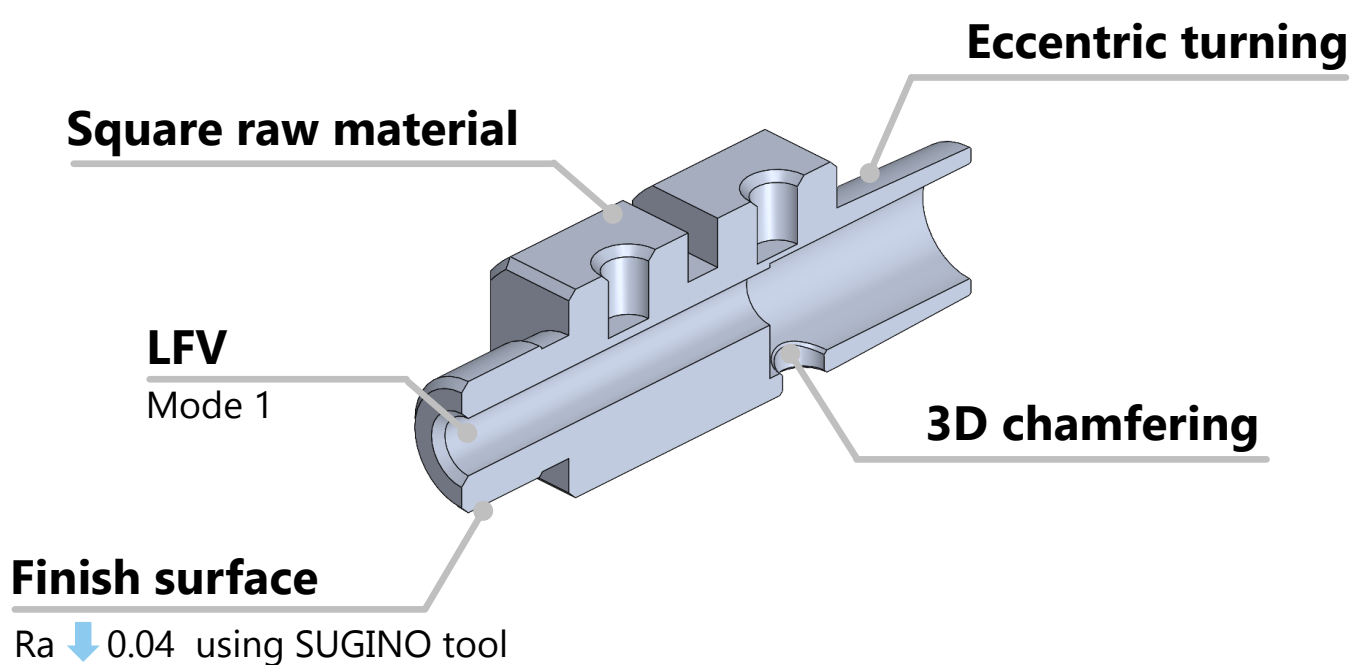
- Machine Catalog
- CMAA2024 document



Usability has also been upgraded. More speed, more stroke, more capacity

Demonstration Workpieces

Joint connector / Pneumatic



One-hit machining checklist

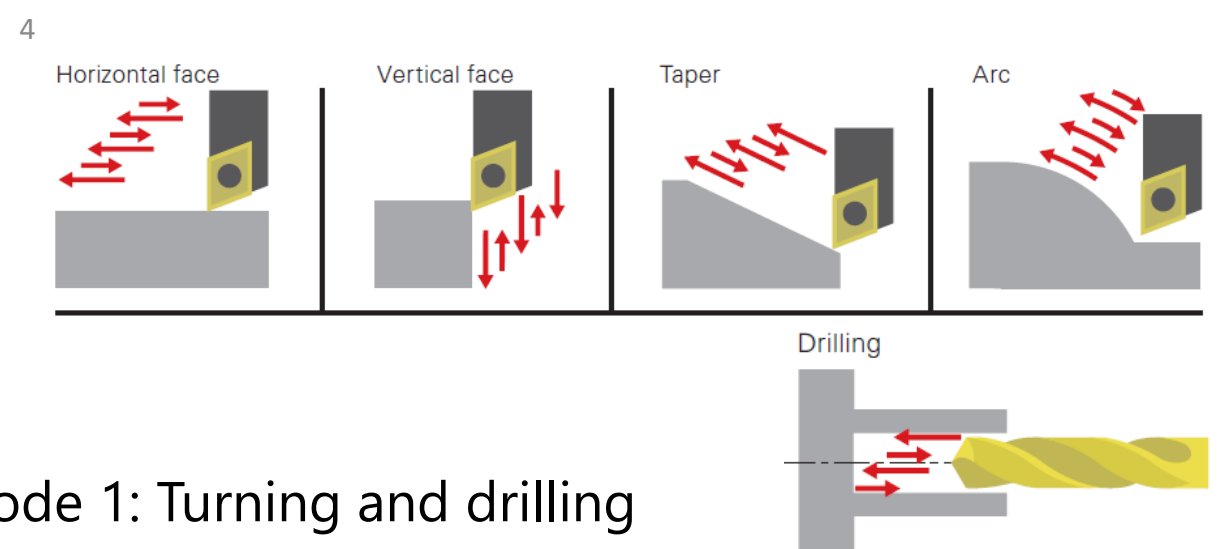
- ✓ Main spindle
(Max 20(25)mm Dia./ 10,000 RPM)
- ✓ Back spindle
(Max 20(25)mm Dia./ 8,000 RPM)
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 4 axis
(X,Y,Z,C)



Highlight machine

LFV (Low frequency vibration)

The servo axes are vibrated in the axial direction using a unique control technology where by cutting is performed while synchronizing this vibration with the rotation of the spindle

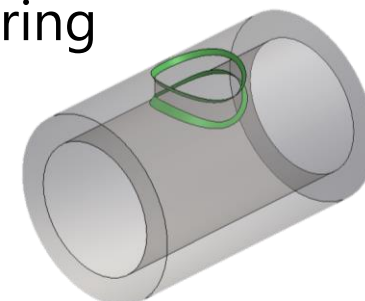


Mode 1: Turning and drilling

Define the number of vibrations per workpiece rotation

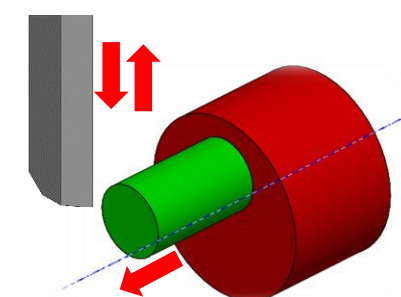
3D chamfering function (G-Code)

Chamfering of cross holes at the inner circumference is also possible as with outer circumference chamfering



Eccentric turning

Lathe refers to the turning off the center



Finish surface (SUGINO)

Sugino Machine's "SUPEROLL" is a tool that crushes the unevenness of metal surfaces and finishes them smoothly.



For more information

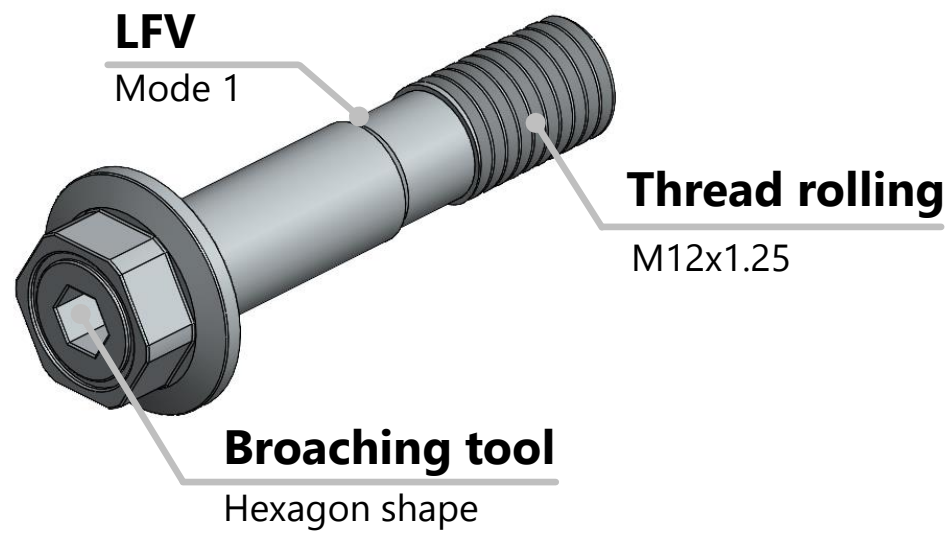
- Machine Catalog
- CMAA2024 document



Cincom's best-selling L series machines

Demonstration Workpieces

Bolt / Automotive



One-hit machining checklist

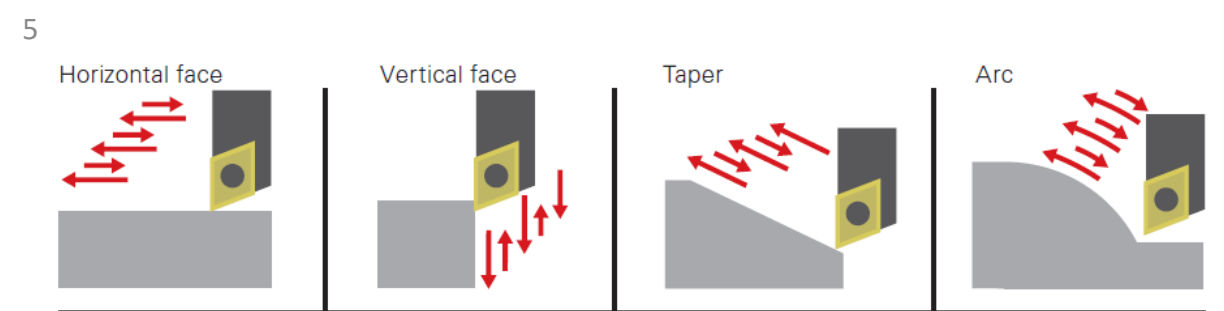
- ✓ Main spindle
(Max 32(38)mm Dia./ 8,000 RPM)
- ✓ Back spindle
(Max 32(38)mm Dia./ 8,000 RPM)
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 4 axis
(X,Y,Z,C)



Highlight machine

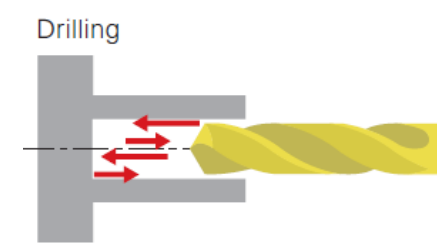
LFV (Low frequency vibration)

The servo axes are vibrated in the axial direction using a unique control technology where by cutting is performed while synchronizing this vibration with the rotation of the spindle



Mode 1: Turning and drilling

Define the number of vibrations per workpiece rotation



Thread rolling

The advantage of thread rolling is increased strength, improved fatigue resistance and faster process compared to traditional threading method



Broaching tool

In rotary broaching, the broach is rotated and pressed into the workpiece to cut an axisymmetric shape



For more information

- Machine Catalog
- CMAP2024 document

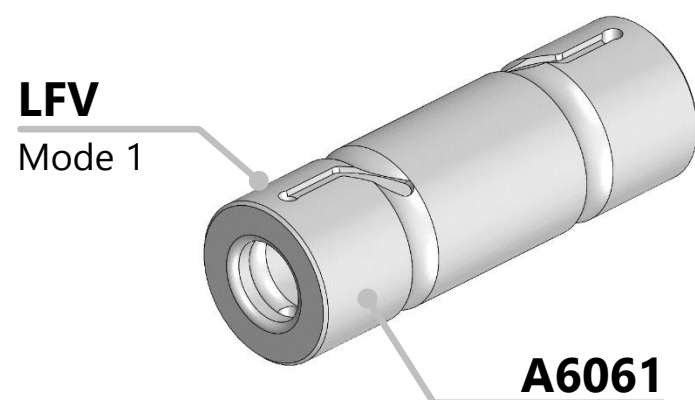


SCAN ME

Usability has also been upgraded. More speed, more stroke, more capacity

Demonstration Workpieces

Joint connector / Pneumatic



One-hit machining checklist

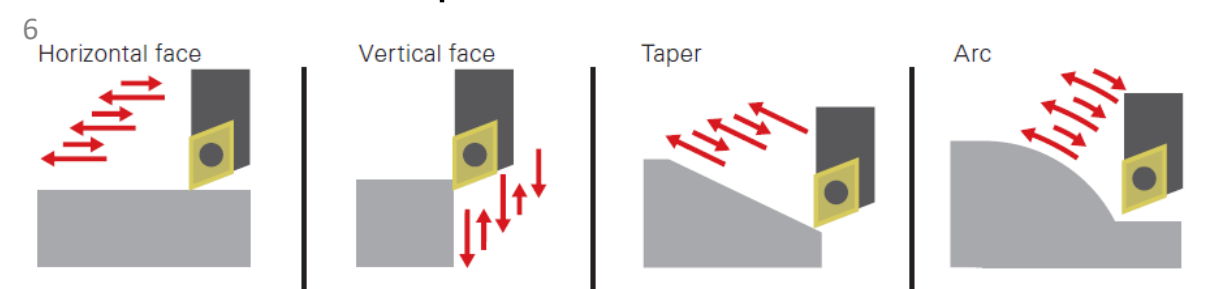
- ✓ Main spindle
(Max 20(25)mm Dia./ 10,000 RPM)
- ✓ Back spindle
(Max 20(25)mm Dia./ 8,000 RPM)
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 4 axis
(X,Y,Z,C)



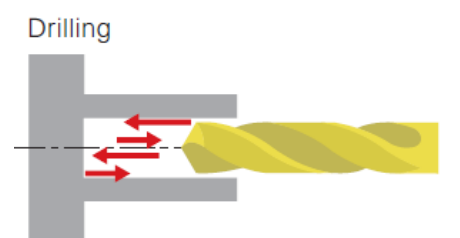
Highlight machine

LFV (Low frequency vibration)

The servo axes are vibrated in the axial direction using a unique control technology where by cutting is performed while synchronizing this vibration with the rotation of the spindle



Mode 1: Turning and drilling



Define the number of vibrations per workpiece rotation

Automatic system

1.Unloader : After cutting operation, Robotics clamp workpieces and bring to measuring station. In final process, It arranges the workpieces into position

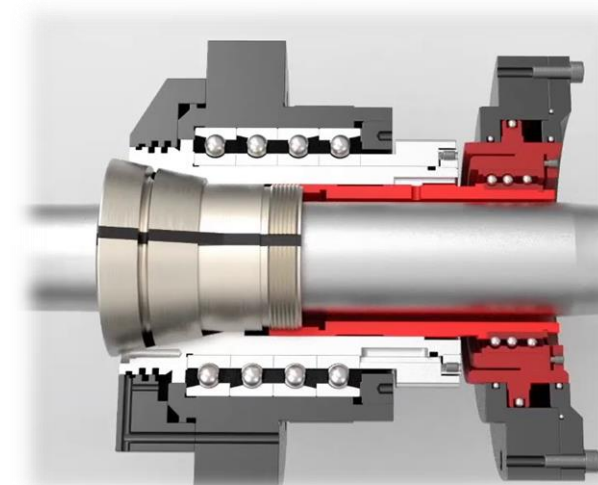
2.Measuring system

2.1 Air-gauge (inner-diameter)

2.2 Linear-gauge (outer-diameter, dimension)

Adaptive guide bushing

The JBS Flexible Guide Bushing for double-cone collets and pull-collets was developed in order to guide and/or clamp work material rods with a varying external diameter in a rotating as well as a stationary condition in Swiss type automatic lathes.



For more information

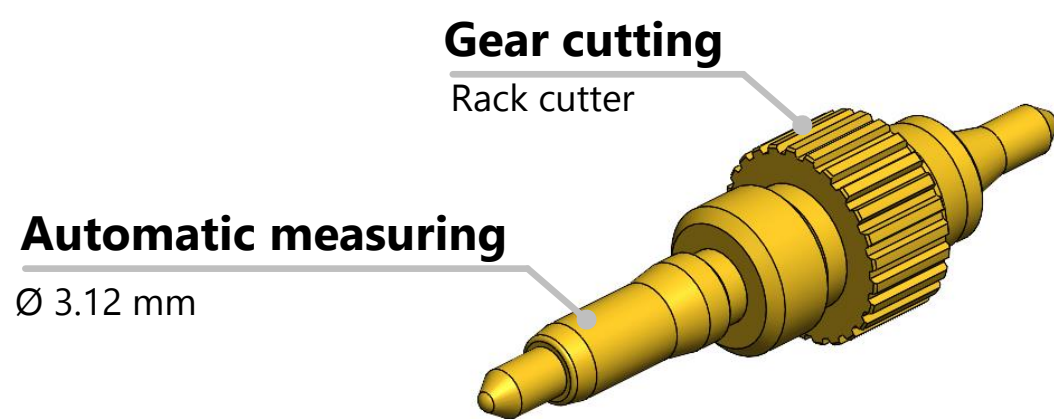
- Machine Catalog
- CMAA2024 document



5-axis machine that can be accommodated in a compact space

Demonstration Workpieces

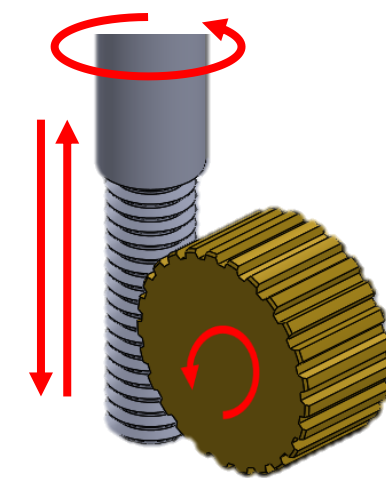
Shaft / Automotive



Highlight machine

🎯 Gear cutting (Rack cutter)

Rack cutter (New solution) similar hob cutter, By The hobbing machining function enables machining for spur gears by controlling C-axis (workpiece axis) rotation synchronously with the rotation of the rotary tool (hob cutter). In part of rack cutter, it is another thing to add x or y to synchronously



One-hit machining checklist

- ✓ Main spindle
(Max 12(16)mm Dia./ 15,000 RPM)
- ✓ Back spindle
(Max 12(16)mm Dia./ 10,000 RPM)
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 4 axis
(X,Y,Z,C)

🎯 Automatic measuring on machine

The majority of METROL's sensors are developed with the design concept of maintaining accuracy in the micron range even in adverse environments where water and coolant splashes.



Direction : 3-Dimension (all round) type
±X, ±Y and Z

Pros • Check NG dimension and alarm

• Auto-offset

Cons • Increase cycle time

• cutting chip need to clear before measuring



For more information

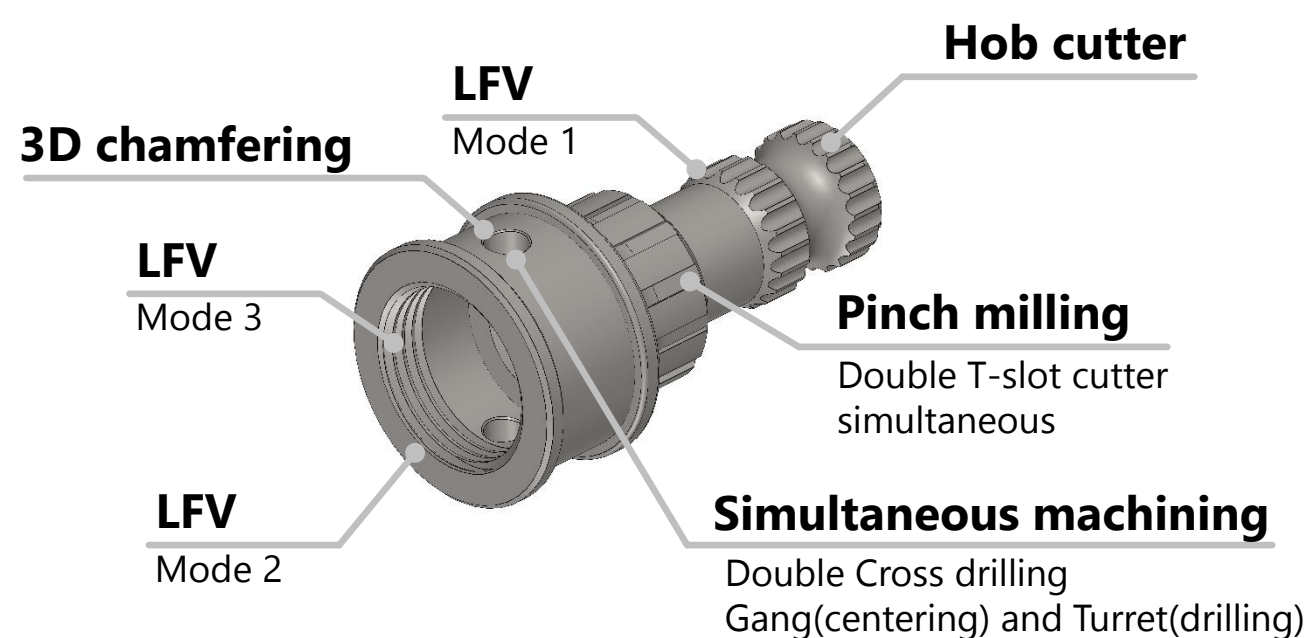
- Machine Catalog
- CMAP2024 document



Ultimate gang tool + turret configuration machine

Demonstration Workpieces

Input shaft / Automotive



One-hit machining checklist

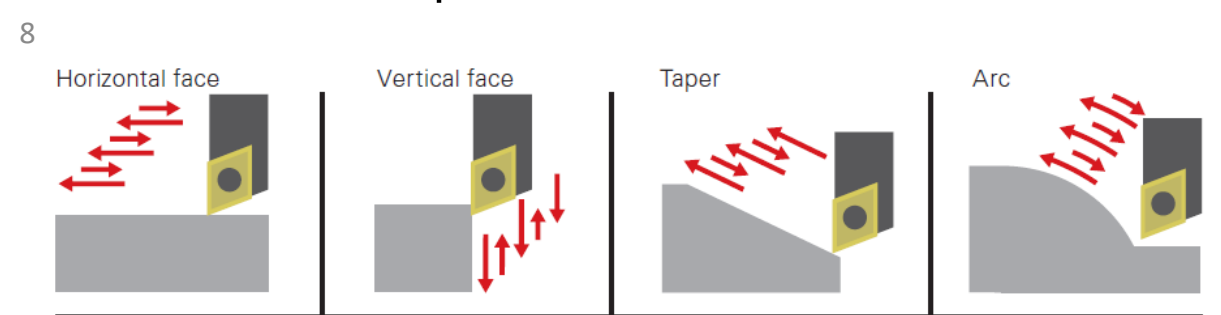
- ✓ Main spindle (Max 32(38)mm Dia./ 8,000 RPM)
- ✓ Back spindle (Max 32(38)mm Dia./ 8,000 RPM)
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 5 axis (X,Y,Z,C,B)
- ✓ Turret 10 station



Highlight machine

LFV (Low frequency vibration)

The servo axes are vibrated in the axial direction using a unique control technology where by cutting is performed while synchronizing this vibration with the rotation of the spindle

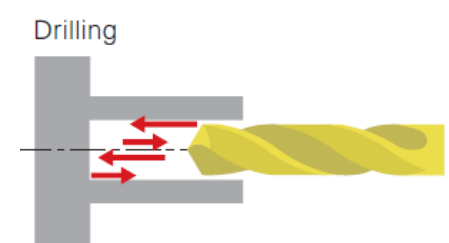


Mode 1: Turning and drilling

Define the number of vibrations per workpiece rotation

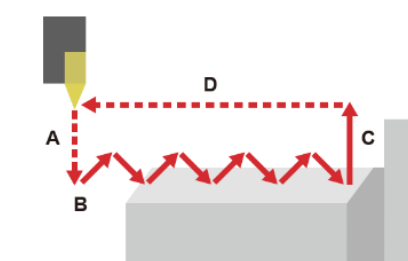
Mode 2: Grooving/Drilling

Define the number of workpiece rotations per vibration



Mode 3: Threading

Processing method which alter the vibration timing within the threading pass



Reduce cycle time (have turret)

- Pinch milling
- Simultaneous cross drilling

Gang tool and Turret **combination**

Hobbing function

The hobbing function enables machining for spur gears by controlling C-axis (workpiece axis) rotation synchronously with the rotation of the rotary tool (hob cutter).

For more information

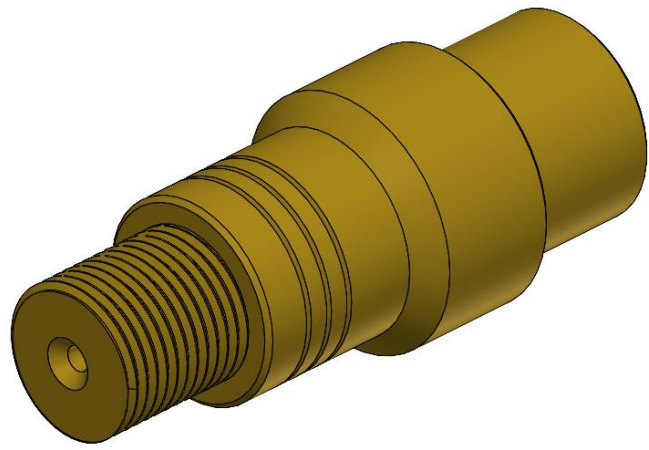
- Machine Catalog
- CMAP2024 document



Cincom's best-selling L series machines

Demonstration Workpieces

Sample test



Highlight machine

🎯 Automatic Tool Changer (ATC)

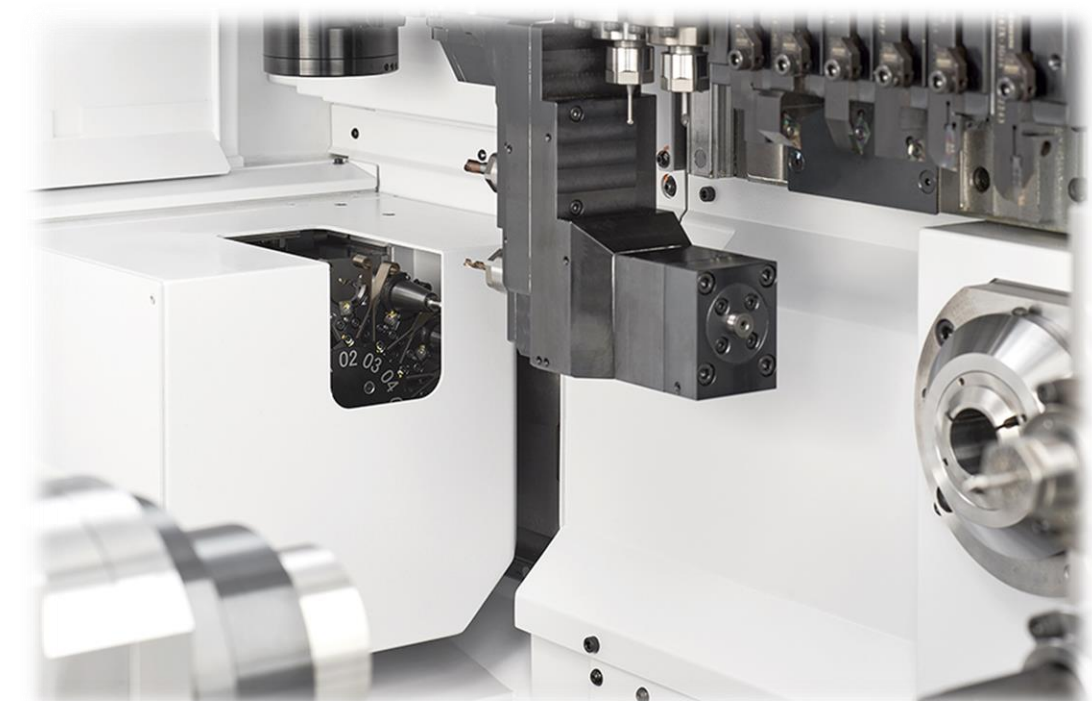
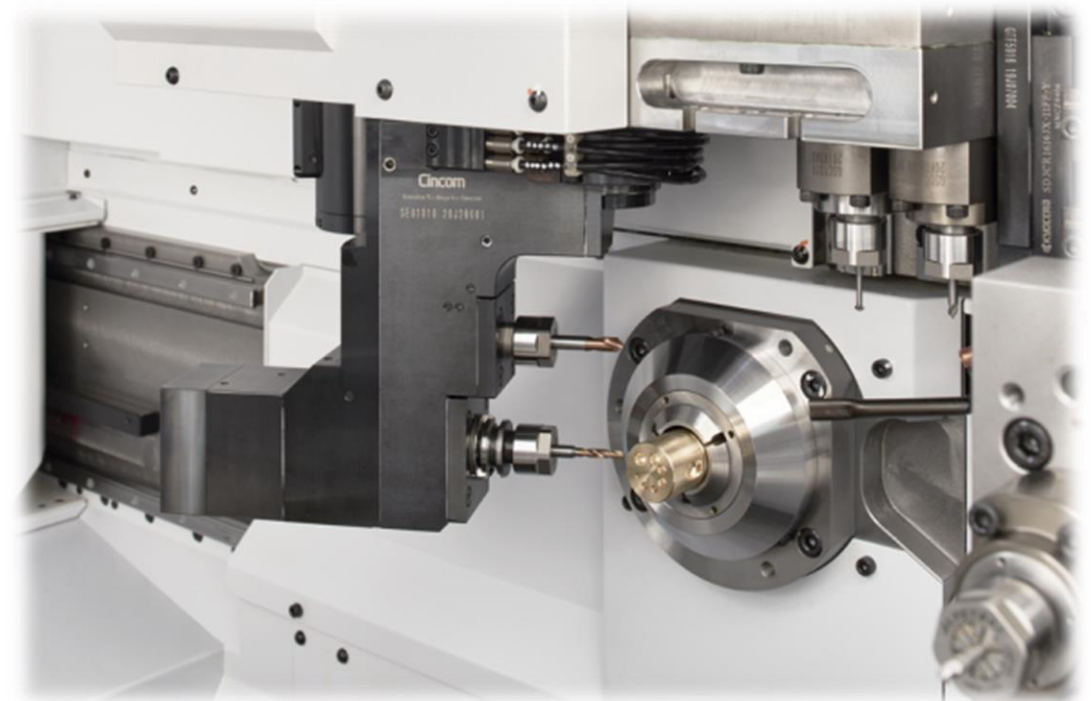
Citizen's unique, compactly designed B-axis ATC tooling can be mounted on the gang tool post to enable use of a total of 13 B-axis tools, comprising 12 ATC tools for front machining and one tool built into the tooling

🎯 Specification

Maximum rotary tool speed	: 12000 rpm
Motor output	: 2.2 kW
Tool holder type	: JBS-15T (ER16)
Tool change time	: 4 sec
Maximum tool outer diameter	: 30 mm Dia.
Number of B-Axis tools	: 12 (magazine) + 1 (built in)

One-hit machining checklist

- ✓ Main spindle (Max 32(38)mm Dia./ 8,000 RPM)
- ✓ Back spindle (Max 32(38)mm Dia./ 8,000 RPM)
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 4+1 axis (X,Y,Z,C,B)



For more information

- Machine Catalog
- CMAP2024 document



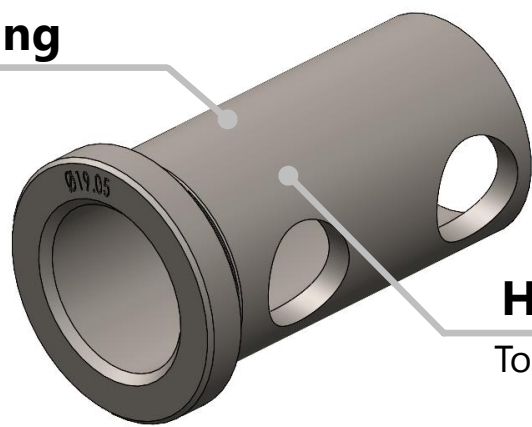
SCAN ME

High efficiency through space savings, High-precision positioning and accuracy

Demonstration Workpieces

Round bush / Machine tool

Hard turning



High precision

Tolerance under ± 5 micron

Highlight machine

Hard turning

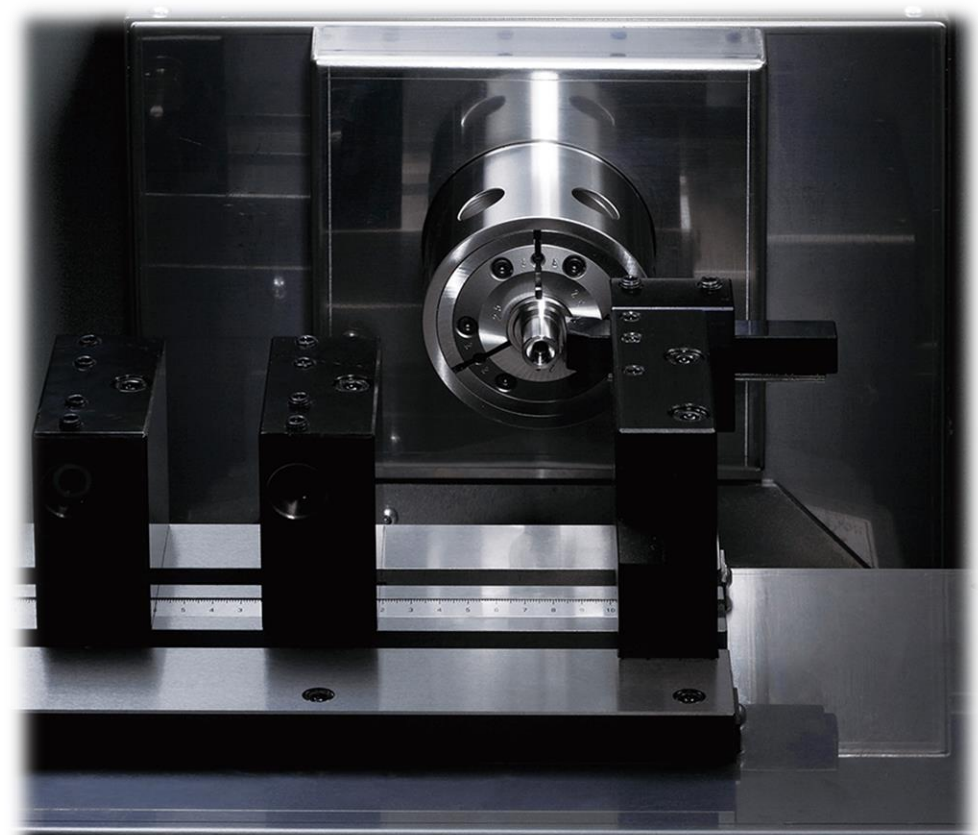
Hard turning support >> material have more than **45 HRC** and **faster than traditional grinding**

High precision

Built-in spindles with forced cooling and built-in sensors give smooth rotation with low vibration thanks to beltless drive. This construction ensures outstanding accuracy and repeatability

One-hit machining checklist

- ✓ Spindle
(Max 6,000 RPM, Collet $\varnothing 35.0$ with stationary / $\varnothing 40.0$ with pull type, Power chuck 3(4)", Diaphragm chuck 4")
- ✓ gantry loader
- ✓ Turning tool
- ✓ Simultaneous machining 2 axis
(X, Z)
- ✓ Horizontal Linear Turret



For more information

- Machine Catalog
- CMAP2024 document

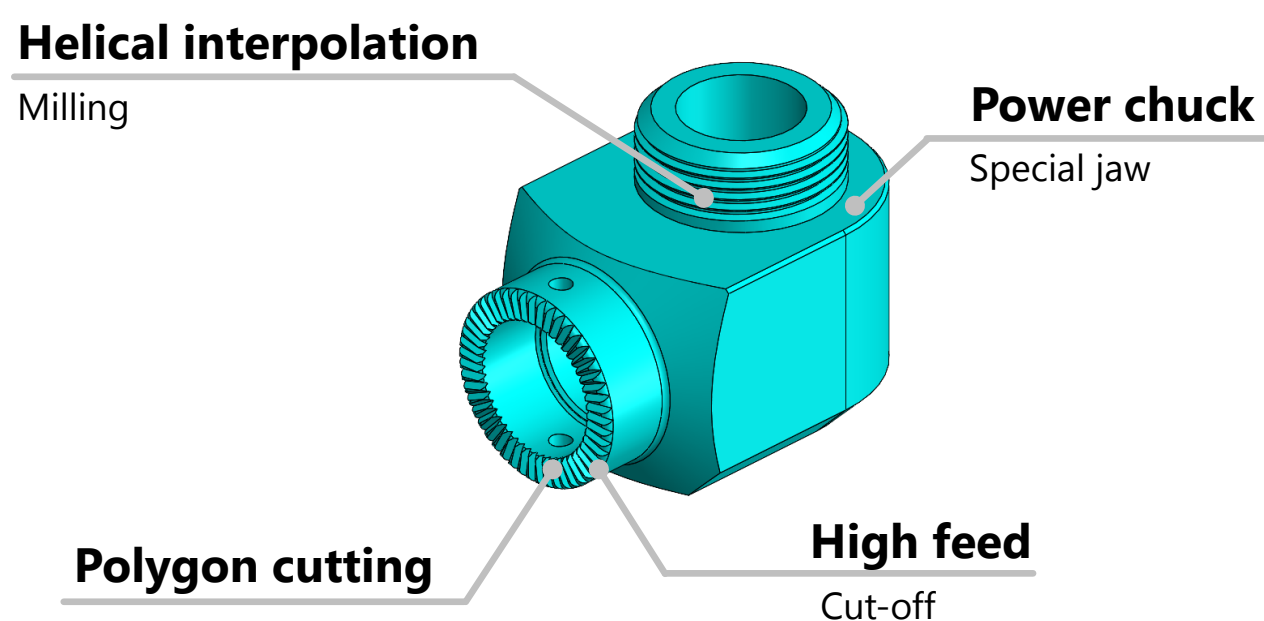


SCAN ME

High performance CNC turning center with 2 spindles, 2 turrets and a Y-axis

Demonstration Workpieces

Connector joint / Machine



One-hit machining checklist

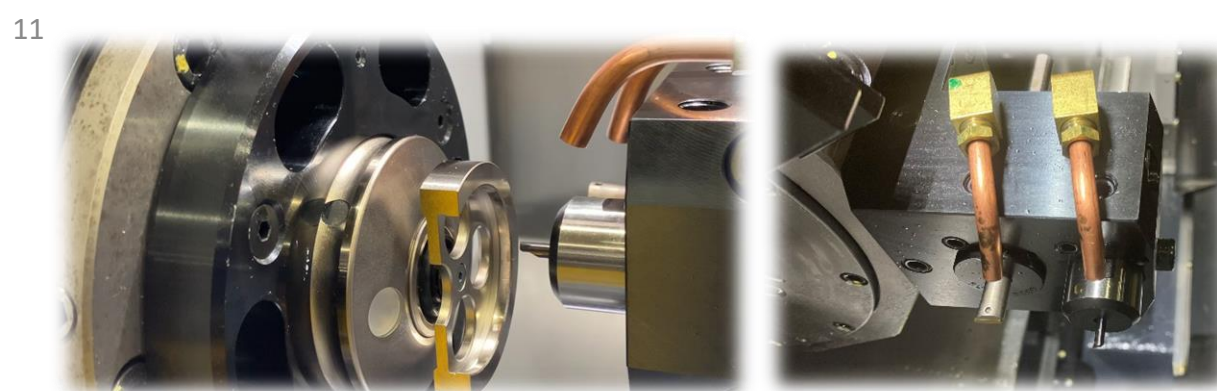
- ✓ Spindle (SP1)
(Max 5,000 RPM, Collet Ø51.0, Power chuck 6")
- ✓ Spindle (SP2)
(Max 5,000 RPM, Collet Ø42.0, Power chuck 5")
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 4 axis
(X,Y,Z,C,)
- ✓ Turret
HD1 12 station / HD2 8 station



Highlight machine

Geometry tool set

Tool setter designed by CMJ. For response customer that need to set cutting tool simplify. In Geometry tool set can be use for **X and Z axis (Z, OD and ID)**



It help to **protect** tool breakage, **reduce** time to set and **prevent** some mistake for input data

HD1 OFFSET GEOMETRY SHIFT				HD1 OFFSET GEOMETRY						
OFFSET GEOMETRY SHIFT DATA				NO.	X	Z	R	T	Y	
DIS. FROM CHUCK END FACE TO ORIGIN				001	-4.000	-5.000	0.000	0	0.000	
DISTANCE SHIFT DATA				002	0.000	0.000	0.000	0	0.000	
SP1	50.000	654	50.000	003	0.000	0.000	0.000	0	0.000	
SP2	15.000	657	-15.000	004	0.000	0.000	0.000	0	0.000	
SENSOR DIMENSION				005	0.000	0.000	0.000	0	0.000	
SETTING DATA				006	0.000	0.000	0.000	0	0.000	
O. D.	50.038		50.000	007	0.000	0.000	0.000	0	0.000	
I. D.	40.032		40.000	008	0.000	0.000	0.000	0	0.000	
LENGT	38.947		39.000	009	0.000	0.000	0.000	0	0.000	
				010	0.000	0.000	0.000	0	0.000	
				SFT	654	50.000	657	-15.000	Y	0.000

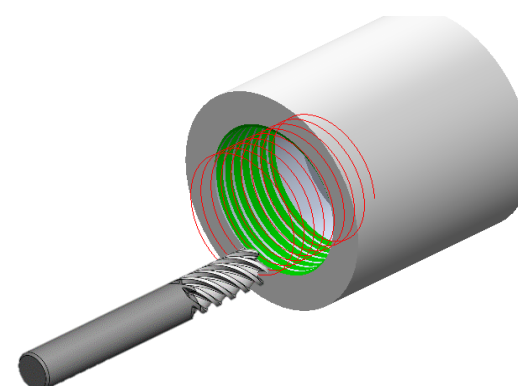
For setting of equipment, Having new screen for easy to set cutting tool. The installation method is used by **magnetic** principle and can be installed as SP1 and SP2.

Polygon

The polygon machining function enables polygon machining by controlling rotary tool rotation synchronously with the rotation of the spindle.

Helical interpolation

The machine can provide the circular interpolation for arbitral two axes among the three axes (X1, Y1, and Z1 or Z2 axes) which are perpendicular with one another and also the linear interpolation for the remaining axis in synchronization with the circular rotation.



For more information

- Machine Catalog
- CMAA2024 document

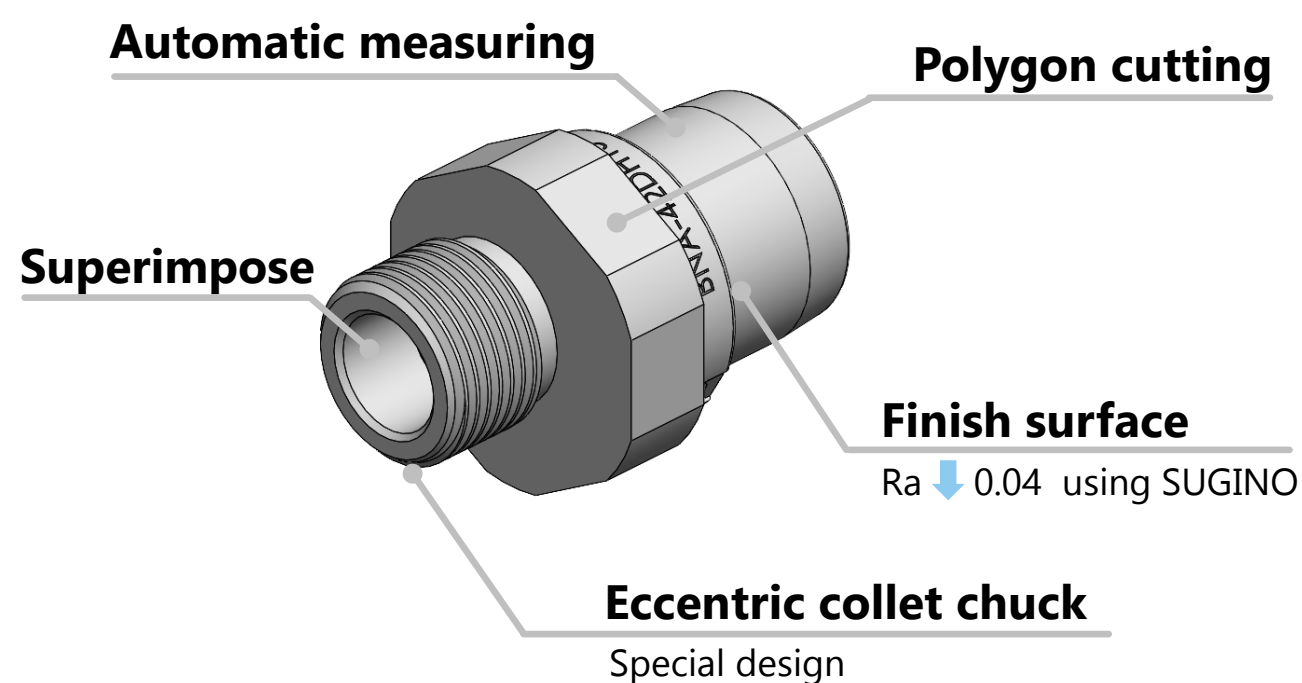


SCAN ME

The BNA series packs sophisticated functions and high accuracy

Demonstration Workpieces

Connector body / Hydraulic



One-hit machining checklist

- ✓ Spindle (SP1)
(Max 6,000 RPM, Collet Ø42.0, Power chuck 5")
- ✓ Spindle (SP2)
(Max 5,000 RPM, Collet Ø34.0, Power chuck 4")
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 4 axis
(X,Y,Z,C,)
- ✓ Turret
SP1 8 station / SP2 6 station

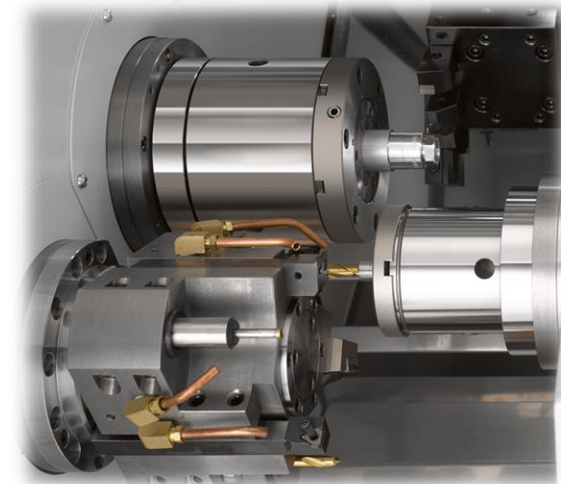


Highlight machine

Superimpose

Simultaneous left/right processing with a main turret and compact sub-turret and overlap processing with double turning tools sharply cut the machining time

12



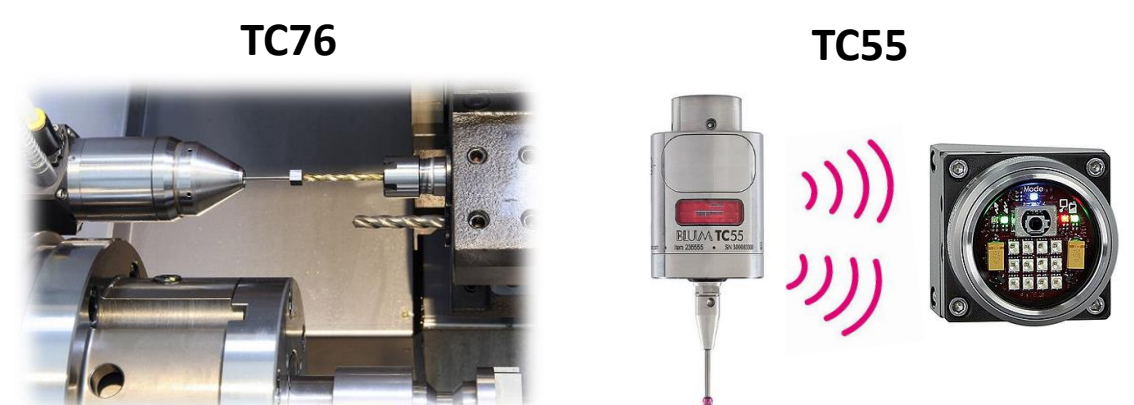
Finish surface (SUGINO)

Sugino Machine's "SUPEROLL" is a tool that crushes the unevenness of metal surfaces and finishes them smoothly.



Automatic measuring on machine

BLUM touch probes are used for fast and automatic workpiece measurement and workpiece referencing in machine tools.



Direction : 3-Dimension (all round) type
±X, ±Y and ±Z

- Pros
- Check NG dimension and alarm
 - Auto-offset
 - Tool Breakage Detection

- Cons
- Increase cycle time
 - Cutting chip need to clear before measuring

For more information

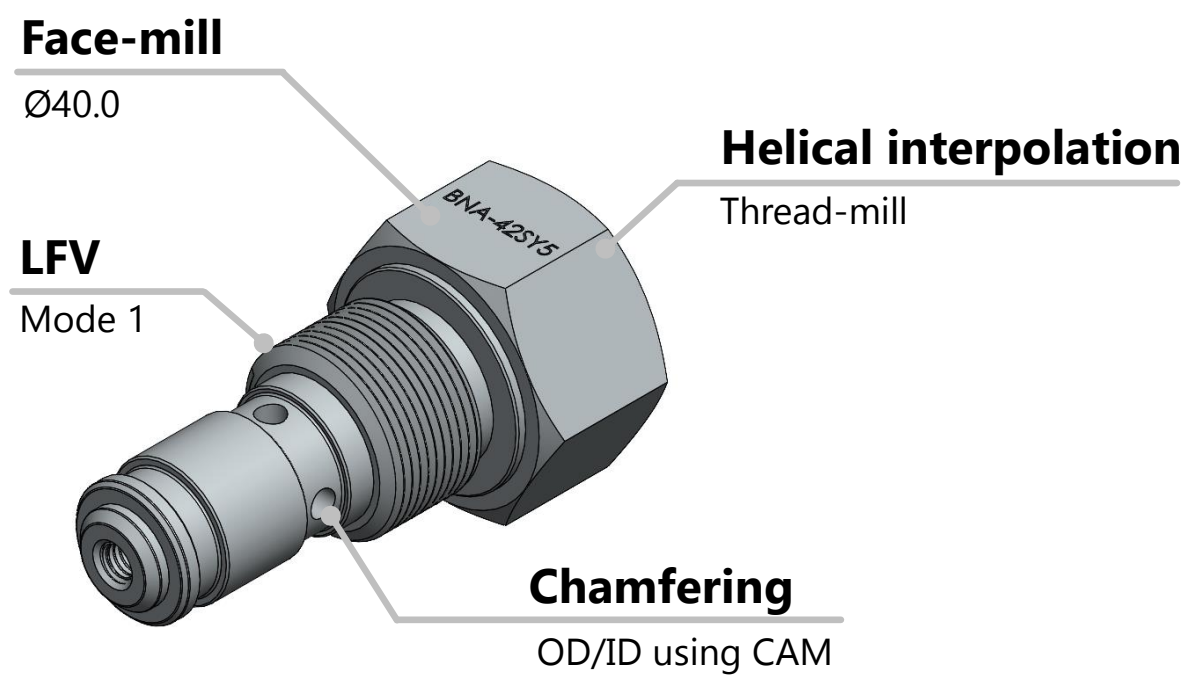
- Machine Catalog
- CMAA2024 document



SY type with improved performance as a bar-material processing machine

Demonstration Workpieces

Safety relief valve / Hydraulic



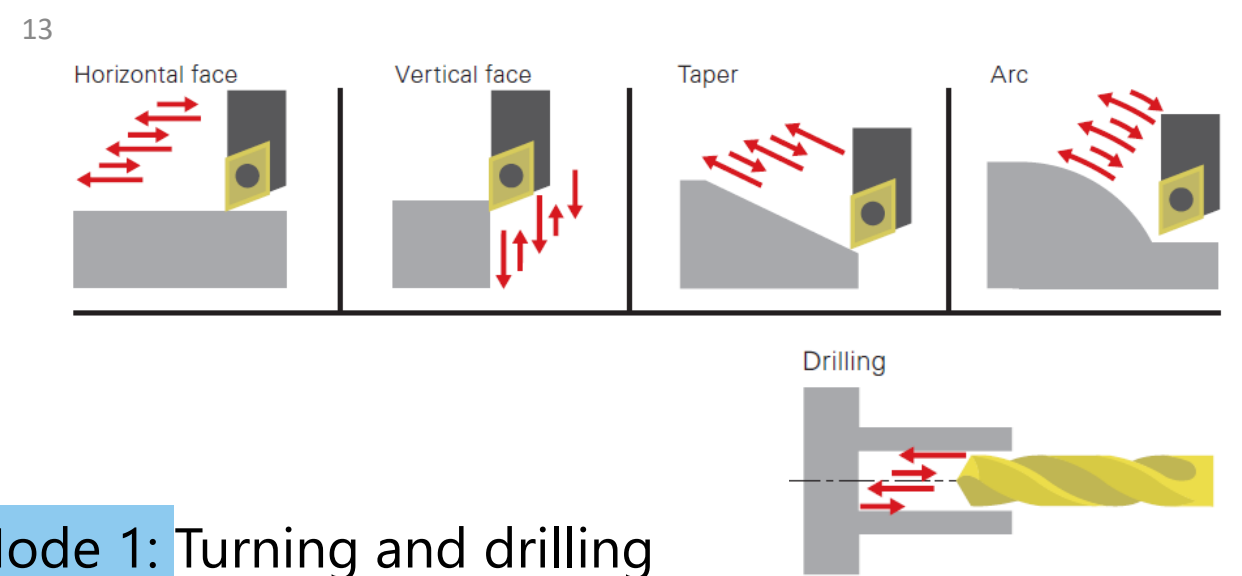
One-hit machining checklist

- ✓ Spindle (SP1)
(Max 6,000 RPM, Collet Ø42.0, Power chuck 5")
- ✓ Spindle (SP2)
(Max 5,000 RPM, Collet Ø34.0, Power chuck 4")
- ✓ Turning tool
- ✓ Rotary tool (Cross, End-face)
- ✓ Simultaneous machining 4 axis
(X,Y,Z,C,)
- ✓ Turret 12 station

Highlight machine

LFV (Low frequency vibration)

The servo axes are vibrated in the axial direction using a unique control technology where by cutting is performed while synchronizing this vibration with the rotation of the spindle

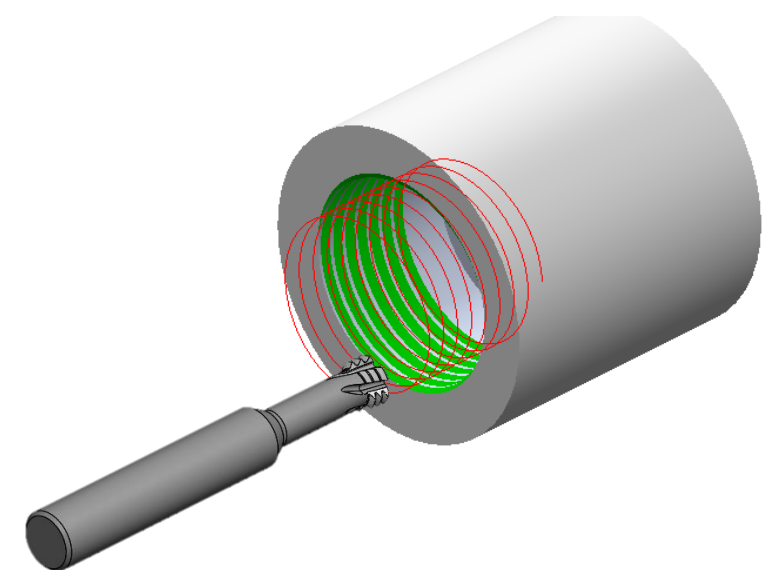


Mode 1: Turning and drilling

Define the number of vibrations per workpiece rotation

Helical interpolation

The machine can provide the circular interpolation for arbitrary two axes among the three axes (X1, Y1, and Z1 or Z2 axes) which are perpendicular with one another and also the linear interpolation for the remaining axis in synchronization with the circular rotation.



For more information

- Machine Catalog
- CMAA2024 document

