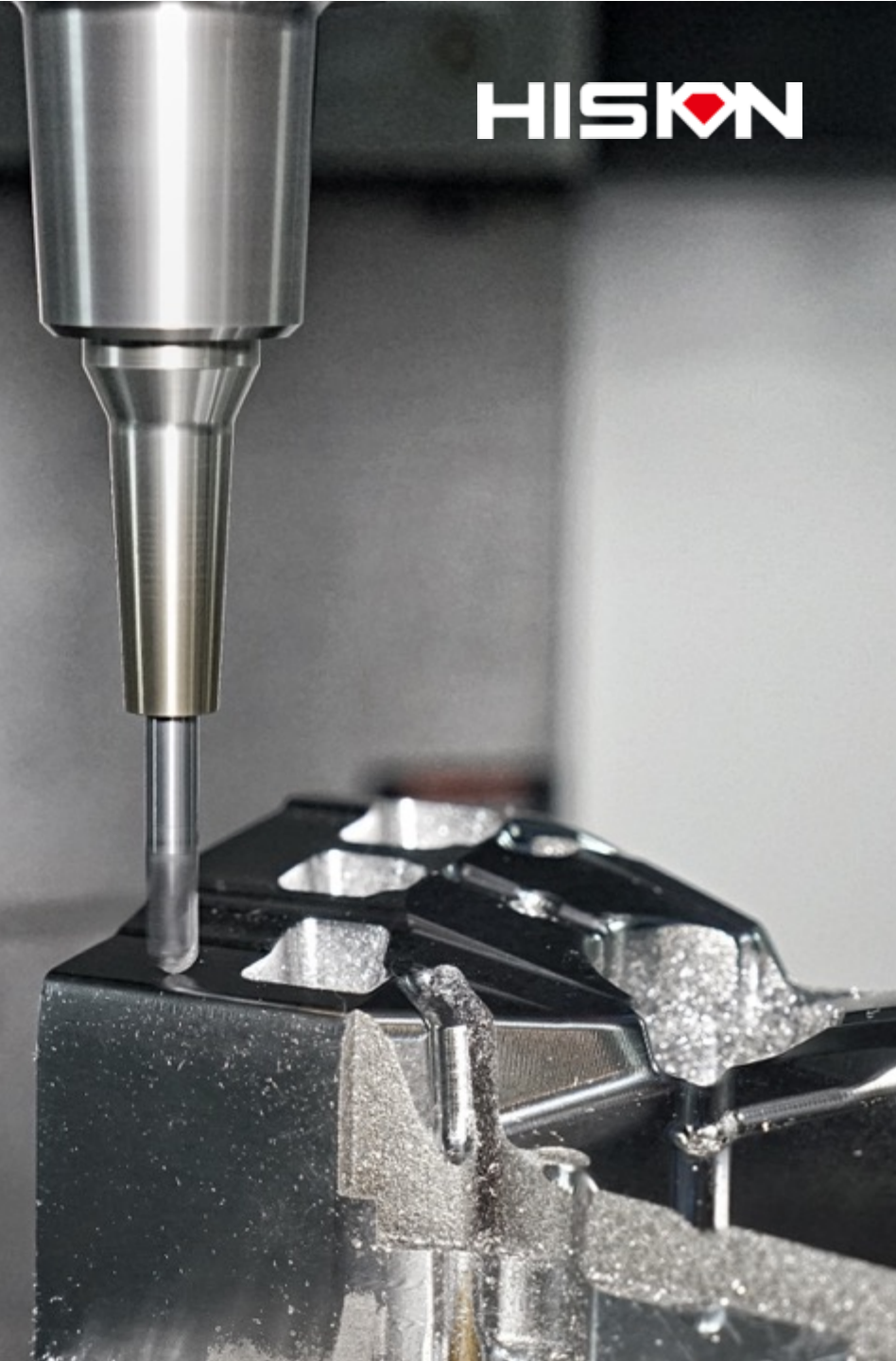


CFV advantages



Vertical Machining Center - CFV Series

Item	CFV600	CFV900	CFV1100
Travel X/Y/Z (mm)	600/430/510	900/430/510	1100/540/520
Table size(mm)	900×430	1100×430	1300×550
Spindle speed (rpm)	12000	12000	12000



Market Positioning

CFV series

Characteristics of
Machine Tools

Automation

Target Market

Market Positioning

VMC in China market

EURO : CHIRON, MIKRON, HERMLE, etc



The first echelon

CFV series



DMG, OKUMA, MAZARK ,etc



The second echelon





HAAS, DOOSAN, YCM, [TONGTAI](#) etc



The third echelon

CFV Series





CFV main rivals spec

		HISON	HAAS	MAZAK	
		CFV900	VF-2SS	VCS 430A	VCN 410AII
					
Processing scope	X Travel (mm)	900	762	560	560
	Y Travel (mm)	430	406	430	410
	Z Travel (mm)	510	508	510	510
	Spindle nose to table surface (mm)	150-660	102-610	150-660	150-660
Table	Table size (mm)	1100×430	914×356	900×430	900×410
	Max. load (kg)	700	680	500	500
Spindle	Drive system	Built-in	DDS	DDS	DDS
	Spindle speed (rpm)	12000	12000	12000	12000
	Spindle power (kW)	22/10	22.4	18.5/7.5	18.5/7.5
Feed	X/Y/Z(m/min)	36	35.6	42	36
ATC	Spindle type	BT40	BT40	BT40	BT40
	ATC	24	24	30	30
	T to T(sec)	1.5	1.6	1.3	1.3
	C to C(sec)	2.8	2.2	2.9	2.9
Machine size	Machine size (mm)	3967×2746	3175×2515	2080×2624	2094×2600
	Machine height (mm)	2682	2794	2778	2773
	Weight (kg)	6500	3629	4600	4920

CFV Series

CFV main rivals spec



		HISION	HAAS	MAZAK	
		CFV1100	VF-3SS	VCS 530C	VCN 530CII
					
Processing scope	X travel (mm)	1100	1016	1050	1050
	Y travel (mm)	540	508	530	530
	Z travel (mm)	520	635	510	510
	Spindle nose to table surface (mm)	150-670	114-749	150-670	150-670
Table	Table size (mm)	1300×550	1219×457	1300×550	1300×550
	Max. load (kg)	1200	794	1200	1200
Spindle	Drive system	Built-in	DDS	DDS	DDS
	Spindle speed (rpm)	12000	12000	12000	12000
	Spindle power (kW)	22/10	22.4	18.5/7.5	18.5/7.5
Feed rate	X/Y/Z(m/min)	36	35.6	42	36
ATC	Spindle type	BT40	BT40	BT40	BT40
	Quantity	24	24	30	30
	T to T(sec)	1.5	1.6	1.3	1.3
	C to C(sec)	2.8	2.2	2.8	2.9
Machine size	Floor size (mm)	4242×2890	3886×2667	2880×2928	2974×2835
	Machine height (mm)	2755	3023	2808	2843
	Weight (kg)	8000	5657	6630	6630

Market Positioning



Vertical machining centers sold in the Chinese market - Characteristics of each echelon

sequence	Spindle	Rapid : m/min	ATC	stability	Basic parts and moving parts	Each axis	Lubrication	Protection
The first echelon	15000-24000 Built-in spindle	60-90	Full servo drive	The precision is stable for more than ten years	The basic parts are rigid and the moving parts are extremely lightweight	5-axis, or double spindle, z-axis direct drive without counterweight	Centralized grease lubrication	Full enclosure
The second echelon	12000-15000 Built-in spindle	30-60	ATC servo drive	The precision is stable for several years	The basic parts are stable and the moving parts are lightweight	3-axis, or 4-axis, z-axis direct drive without counterweight	Centralized grease lubrication	Full enclosure
CFV series	12000 built-in spindle	36	ATC servo drive	The precision is stable for several years	The basic parts are rigid and the moving parts are extremely lightweight	3-axis, 4-axis or 3 + 2-axis	Centralized grease lubrication	Full enclosure , ATC auto door
The third echelon	8000rpm belt drive or 12000rpm direct drive	20-30	Frequency conversion or common motor drive	The quality is up to standard. It can last for half a year	The basic parts are unstable and the moving parts are heavy	3-axis, z-axis with balance cylinder	Centralized liquid oil lubrication	Semi enclosure, ATC without automatic door
The fourth echelon	8000 belt drive , it actually run 6000rpm	20	common motor drive	Quality is barely up to standard	The basic parts are weak and the moving parts are heavy	3-axis, z-axis counterbalance with weight	No centralized lubrication (slider with grease lubrication)	Without enclosure or open type

Characteristics of Machine Tools

Market Positioning

Target Market

CFV Series

Demo Processing

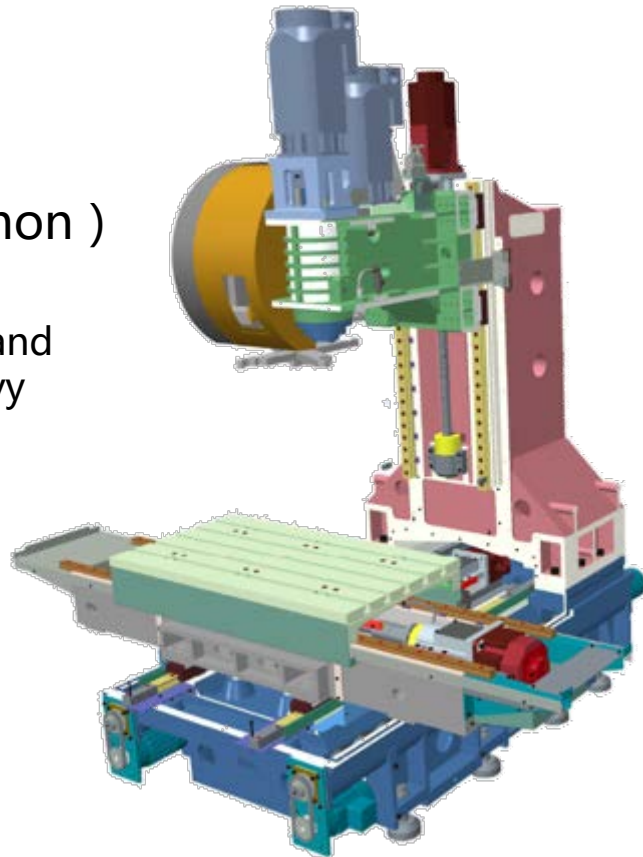
Characteristics of Machine Tools



main features

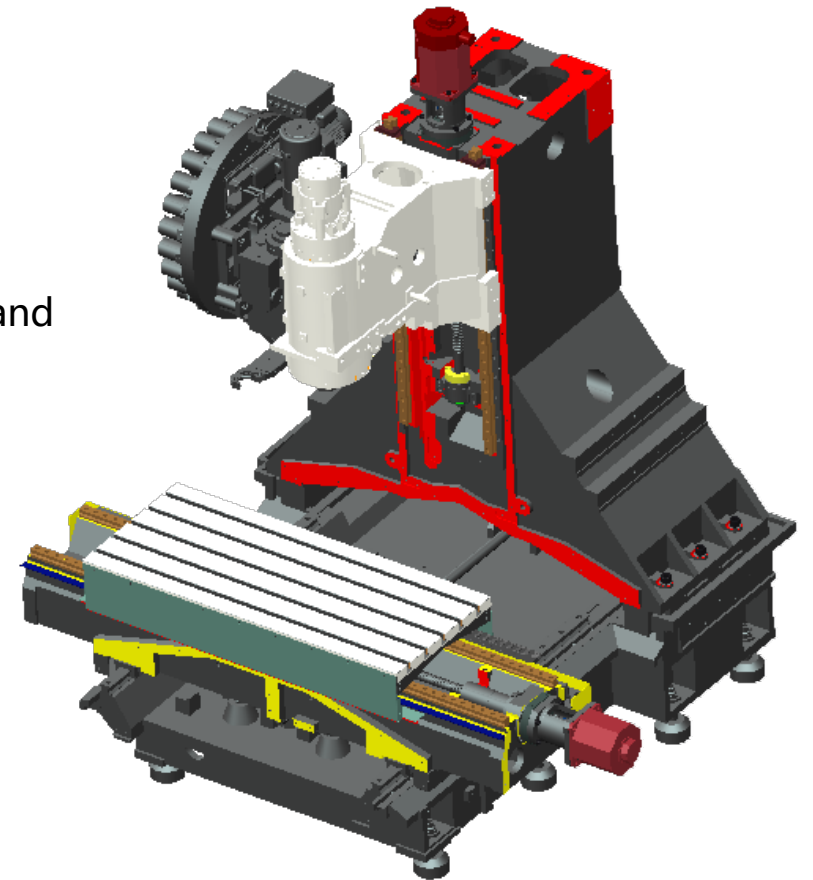
Other brand (common)

The basic parts are weak and the moving parts are heavy



CFV (Great)

The basic parts are rigid and the moving parts are extremely lightweight



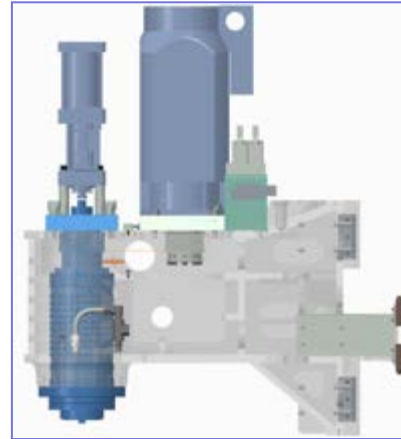
Characteristics of Machine Tools



Spindle box feature

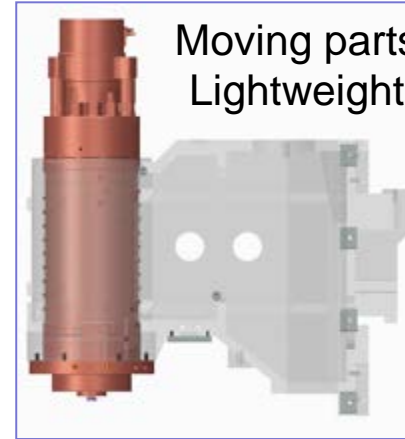
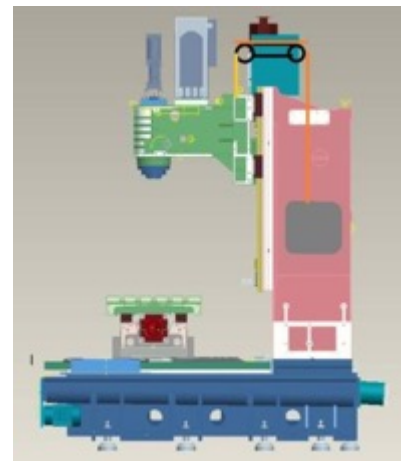
Old design :

Spindle box+spindle+main motor+balance unit+tool release cylinder+belt wheel
6 units : more than 700kg



Old design :

Spindle box+spindle+main motor+balance unit+tool release cylinder+belt wheel
Total weight : 1.2t

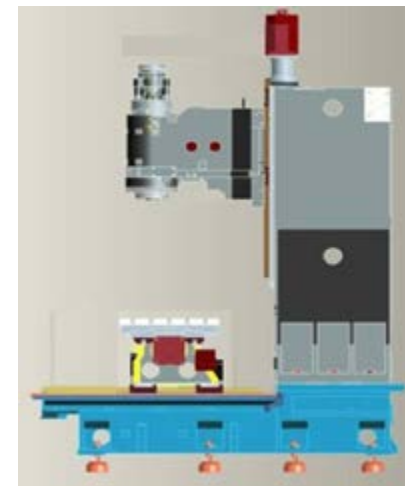


CFV :

Spindle box+built-in spindle
Master core technology to realize lightweight
2units : 500kg

More features:

Thickened column
Built-in spindle high efficiency transmission and start and stop



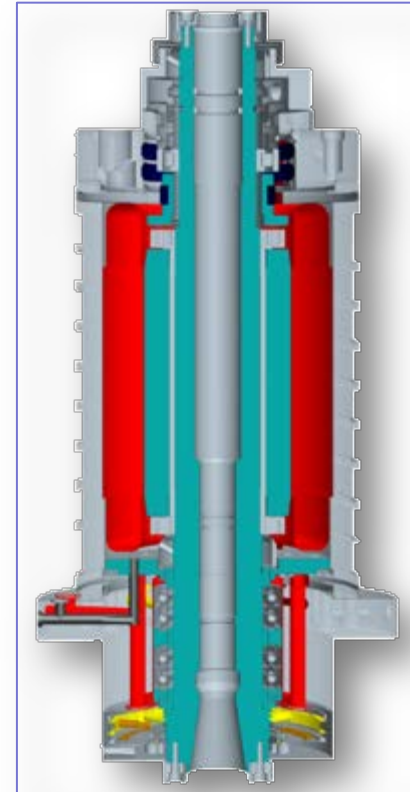
Spindle box feature-tool life increased by **40%**



Other brand (common)

Direct drive 12000rpm

- Due to the drag of the transmission link and the high-speed rotation of multiple parts, the dynamic balance cannot be guaranteed and the high-speed vibration is serious.
- The elastic coupling seriously affects the starting and stopping speed of the spindle, and the power loss is serious.
- $\varnothing 160$ The outer diameter of parts is easy to deform under force, and the cutting accuracy is stable.



CFV (great)

Built-in spindle

- Rotor spindle integrated single piece rotation, effective control of dynamic balance, stable rotation.
- Standard constant temperature cooling, stable rotation. Achieve 12000 RPM 24 hours continuous rotation.
- $\varnothing 220$ parts outer diameter, high rigidity, cutting stability

Characteristics of Machine Tools

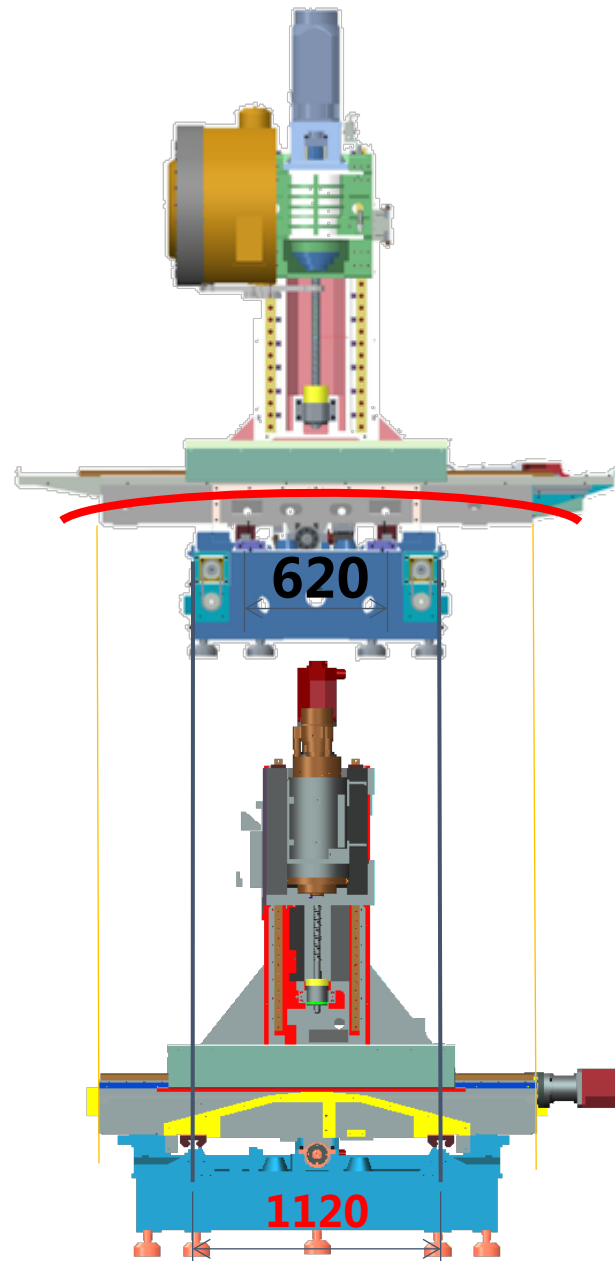
Self made built-in spindle



Characteristics of machine tools

Bed and saddle features

The sagging of both ends of the saddle is the most worrying problem of C-type machine!



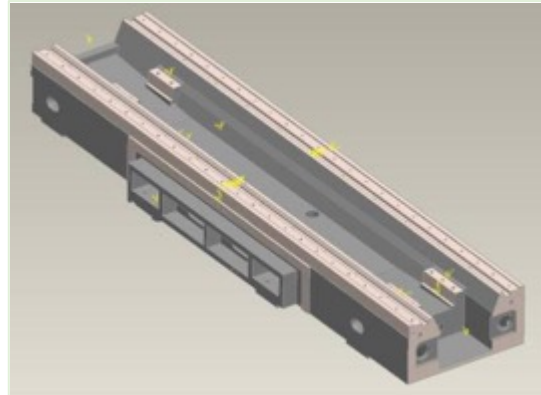
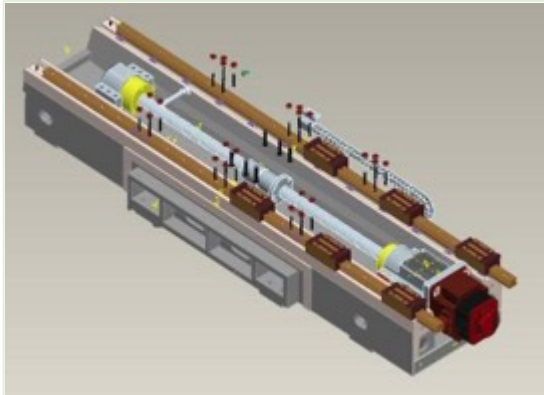
CFV's perfect 2 / 9 support requires a wider bed

The basic part with high rigid

Three axis ball screw features (X axis)

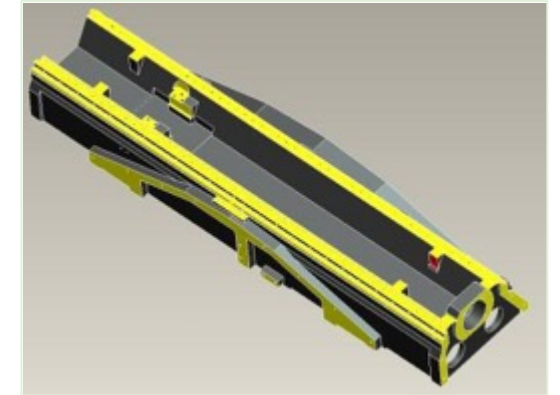
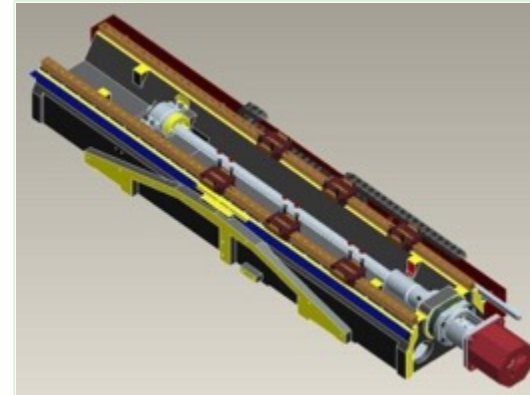
common :

- The conventional VMC is limited by the processing accuracy guarantee ability of the factory, so the motor base and body are designed separately



CFV :

- Integrated design, bridge saddle provides reliable support for table and lead screw pre stretching
- Haitian equipment allows designers to be so willful!



Basic part with high rigid

Three axis coupling

common :

- The elastic coupling is equipped with a rectifying device to sacrifice the transmission rigidity, the metal leaf spring generates noise, and the complex structure generates wind noise



CFV

- CFV ultra-high rigid coupling, its structure does not contain the elements to absorb the axis deviation of the two shafts, has extremely high torsional stiffness
- Smaller outer diameter to obtain torque, reduce the size of the coupling, reduce the moment of inertia .



**Moving parts
Lightweight**



超高刚性



低惯量



无背隙

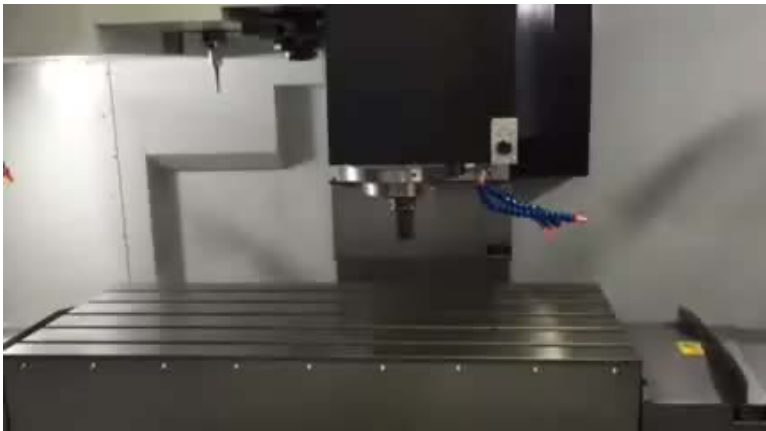


RoHS

CFV ATC – Servo ATC features

Intelligent preparation mode

- Buffering tool to effectively protect the spindle



Intelligent preparation mode

Big and small tool mode

- Bridge boring tool with a maximum diameter of 180 for automatic tool change



Big small & heavy tool mode

Heavy tool mode

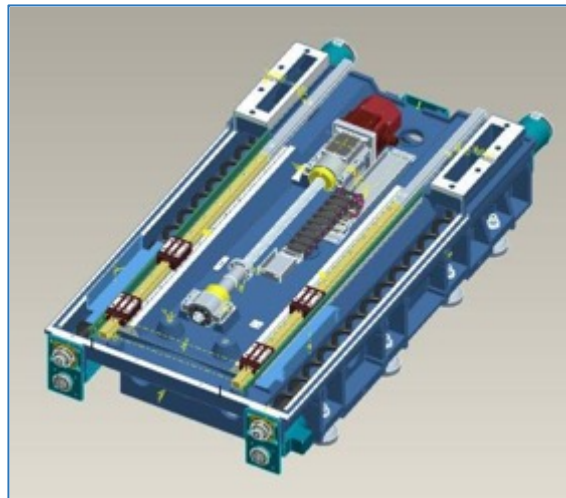
- Slow exchange tool in this mode to avoid the risk of rapid tool change

Characteristics of Machine Tools

Chip conveyor features- thermal separation or thermal isolation

common :

- The conventional VMC helix chip conveyor is installed on the casting bed, and the biggest influence on the bed accuracy comes from a large amount of heat transfer from the iron chips to the body, resulting in deformation

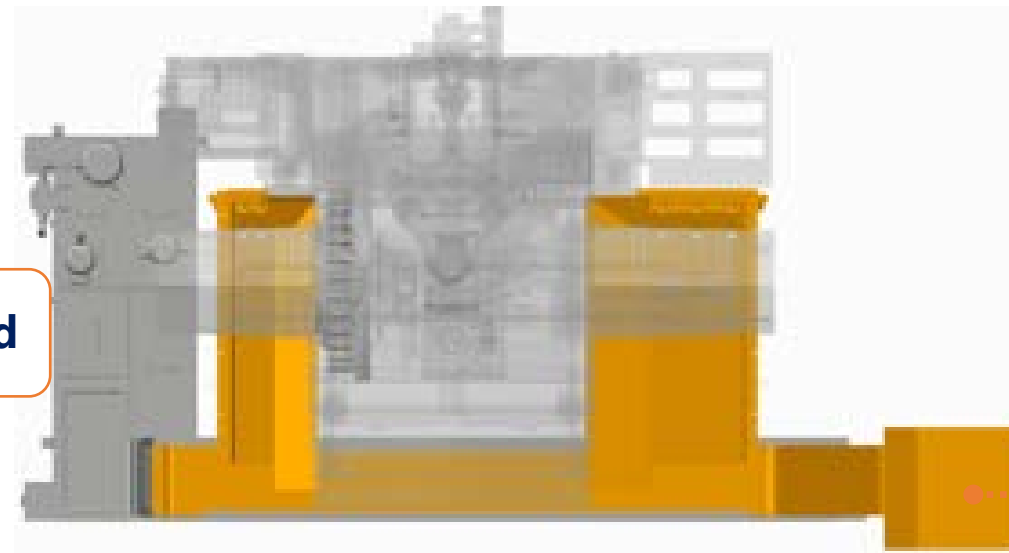


standard

CFV

- **CFV helix chip conveyor is installed on the split sheet metal, and equipped with multiple large flow spray, and the water tank can quickly discharge iron chips.**
- **It doesn't influence the temperature of the processing area due to the heat transfer of iron chips to the bed body, large flow spray and 300L large water tank**

Internal large flow spray + external chain type chip conveyor







Chain plate

Characteristics of Machine Tools

VMC Chip conveyor type and recommend list

●: recommend ○: Available ×: unavailable

Material		Steel	Iron	Aluminum, copper, non-metal	Mix material
Chip type					
Internal	Spray	×	○	●	○
	Helix	●	●	○	●
External	Scraper	×	○	●	○
	chain	●	●	○	●

Characteristics of Machine Tools

CFV other configurations



Spindle hydraulic tool release

◆ Spindle tool release

hydraulic tool release, Spindle built-in cylinder。

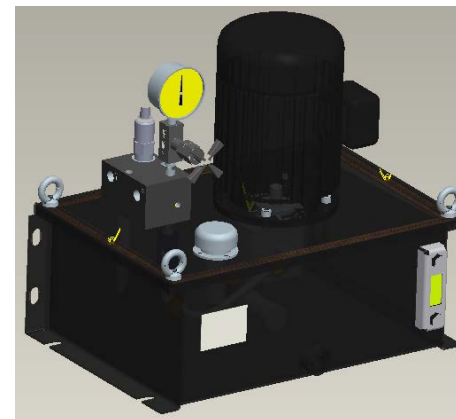
◆ External accumulator

Realize the spindle quick tool release ;

Placed close to the spindle's built-in cylinder ;

Low pressure alarm controls accumulator pressure ;

At low pressure alarms, the accumulator pressure still meets the tool pressure requirements.

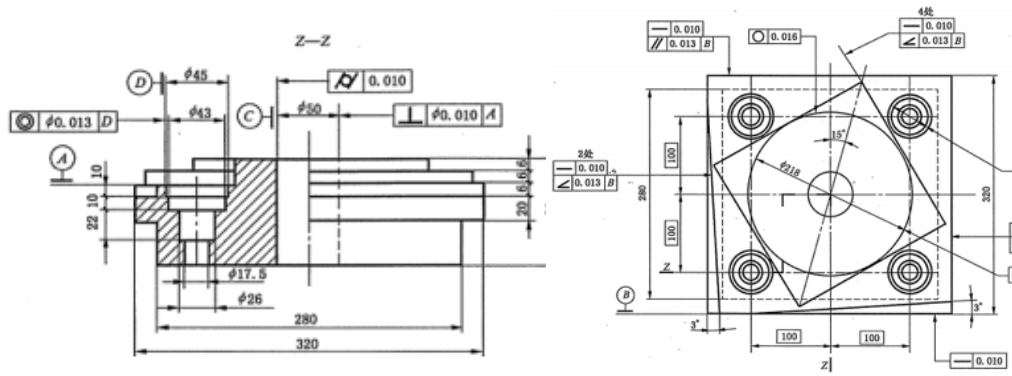


Characteristics of Machine Tools

Excellent performance –CFV accuracy

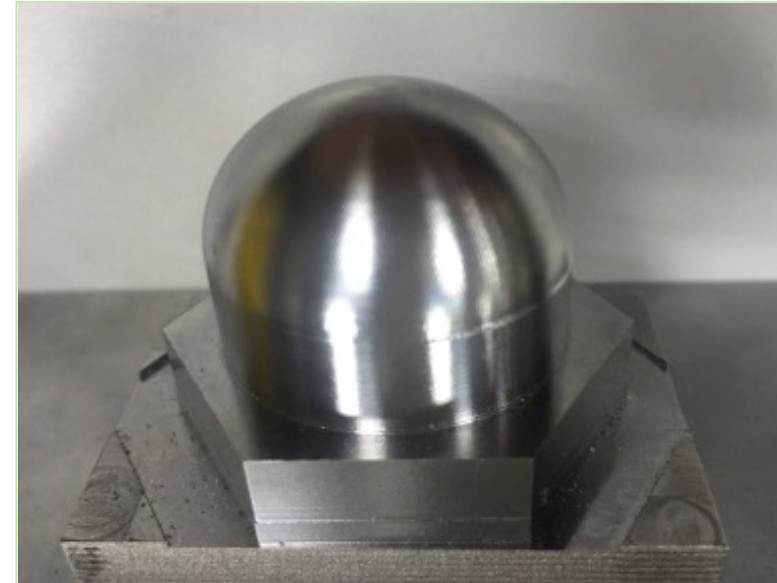
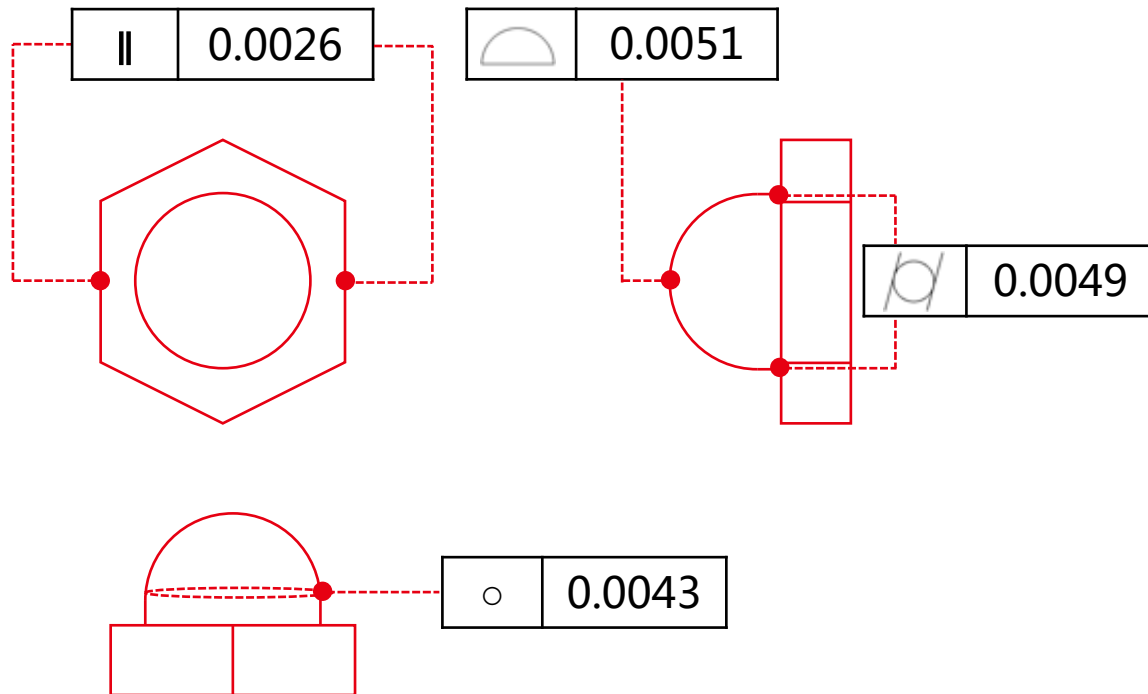


Item		Allowable error(mm)	Real error(mm)
Center hole	a)Cylindricity	0.010	0.0035
	b) The perpendicularity of the hole axis to the base A	Φ0.010	Φ0.0017
Positive square	c)Straightness of the edge	0.010	0.0012
	d)The perpendicularity of the adjacent edge to the base B	0.013	0.0039
	e) Parallelism of the opposite side to the base B	0.013	0.0081
Diamond	f) Straightness of the edge	0.010	0.0021
	g)The inclination of the four sides to the reference B	0.013	0.0026
Circle	h) Roundness	0.016	0.0041
	i) Concentricity of the outer circle and the center hole C	Φ0.016	0.0037
Bevel	j) Straightness of the face	0.010	0.0036
	k) Inclined to the inclination of the base B	0.013	0.0045
Boring	l)Position of the hole relative to the center hole C	Φ0.030	Φ0.0174
	m) Concentricity of inner and outer holes D	Φ0.013	Φ0.0026



Characteristics of Machine Tools

Excellent performance –CFV accuracy



Target Market

Characteristics of
Machine Tools

Demo Processing

Market Positioning

Processing Cases

Target Market

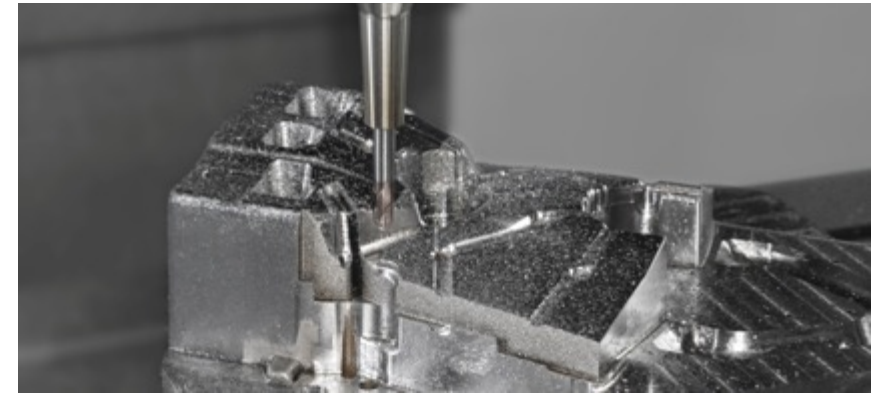
Auto parts

- 批量产品稳定生产



Mold processing (x / y roller slider is recommended)

- Die casting mold, plastic mold, mold core and other rough machining to finish the whole sequence



Nonferrous Metals

- Aviation aluminum, die casting aluminum, mold copper electrode and other high-speed and efficient processing.



Demo Processing

Target Market

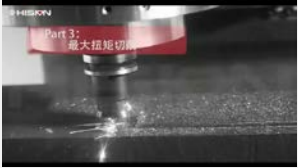




Processing Cases

Characteristics of
Machine Tools

Sales Information

Demo Processing

Excellent performance - demonstrate cutting capability

Item	Material	Tool diameter(mm)	Rotation (rpm)	Feed (mm/min)	Video (CFV1100)	
Power (Full load)	HT300	Ø50 (ap 4 , width 40)	500	1200		tapping : M2 6000rpm
Maximum resistance	HT300	Ø42	600	180		
high speed cutting	Aviation aluminum	Ø19 (ap3)	11000	12000		
Tapping	45-T235	M24 Rigid tapping	1800			

Processing Cases

Demo Processing

Sales Materials

Target Market

Automation

Processing Cases

Excellent performance– Production capacity



Op	Tool	Deep	Speed rpm	Feed mm
Roughing	D19.7	3mm	10000	12000
Finishing	D15.7	1mm	11150	5000



Case	Aviation aluminum high speed milling
Equipment	CFV900

Processing Cases

Excellent performance– Production capacity



7min02sec

The factory used Taiwan machine tools with American machine

5min30sec

CFV1100
Same program

4min42sec

CFV1100
After exerting CFV rigidity and precision stability, the cutting parameters are optimized

Efficiency improvement
33%



Case	AUTO parts
OP	Transmission box OP20 process
Material	Die-cast aluminum parts
Tool	18T

Processing Cases

Excellent performance— Production capacity

4min05sec

3min 10sec

HASS vertical
machining center
processes

CFV1100
Same program



Efficiency
improvement
28%



Case	AUTO parts
OP	Air conditioning compressor cylinder block
Material	Die-cast aluminum parts
Tool	5T

Sales Information

Processing

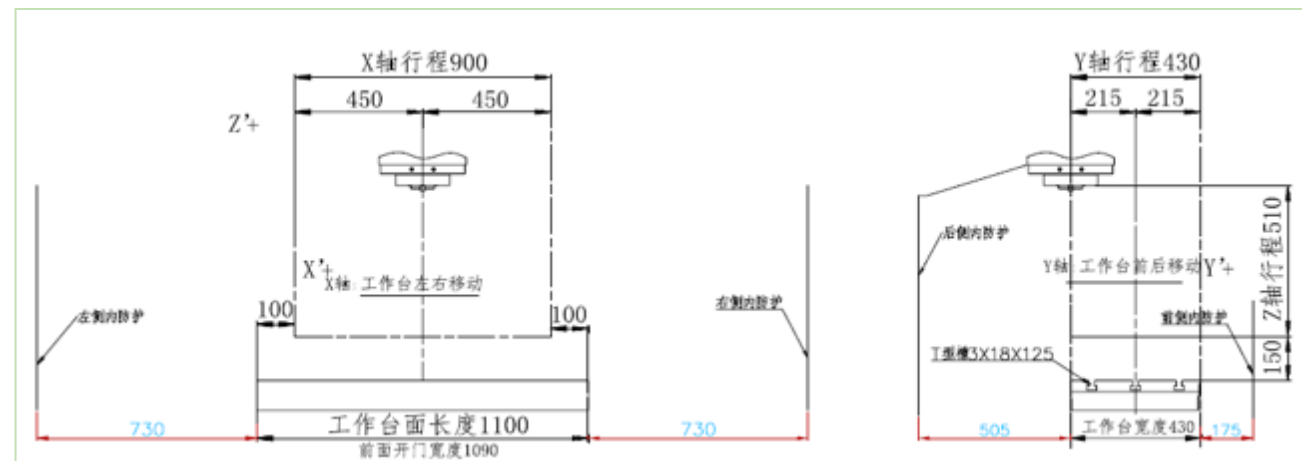
Automation

Demo Processing

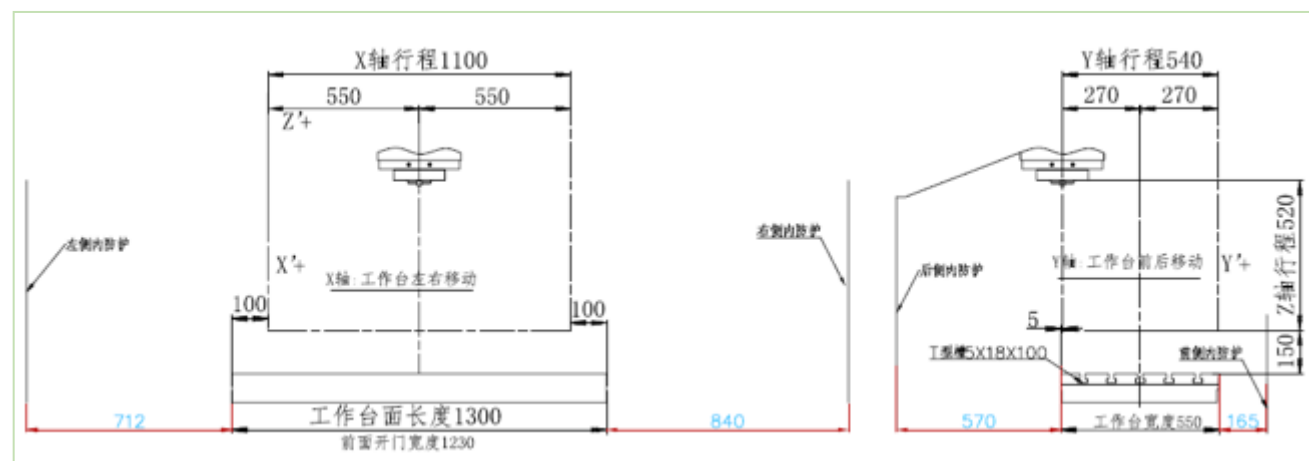
CFV Series

Sales Information

CFV processing scope



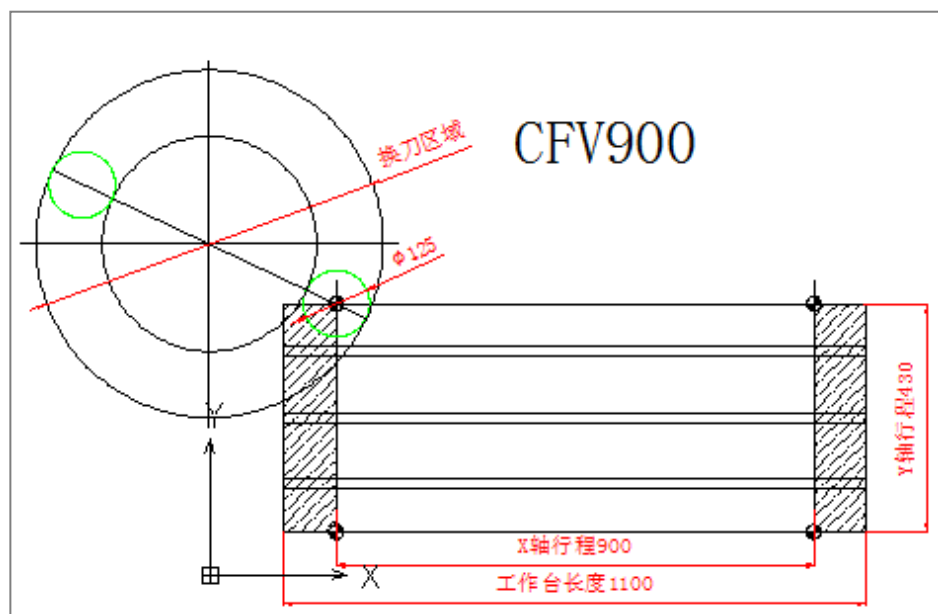
CFV900



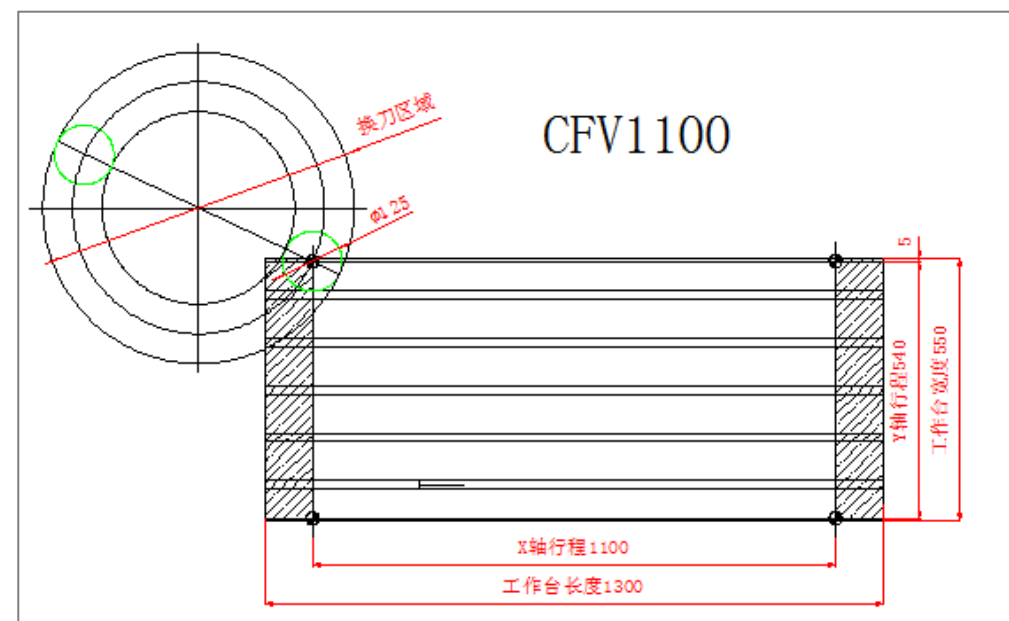
CFV1100

Sales Information

CFV Tool exchange interferogram



CFV900



CFV1100

HISKON



海天精工微信公众号

Thank you !
www.Haitianprecision.com