

M SERIES

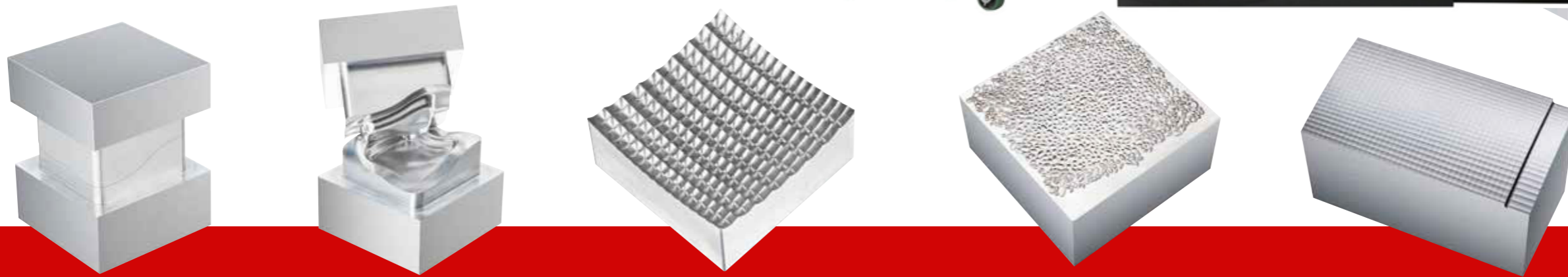
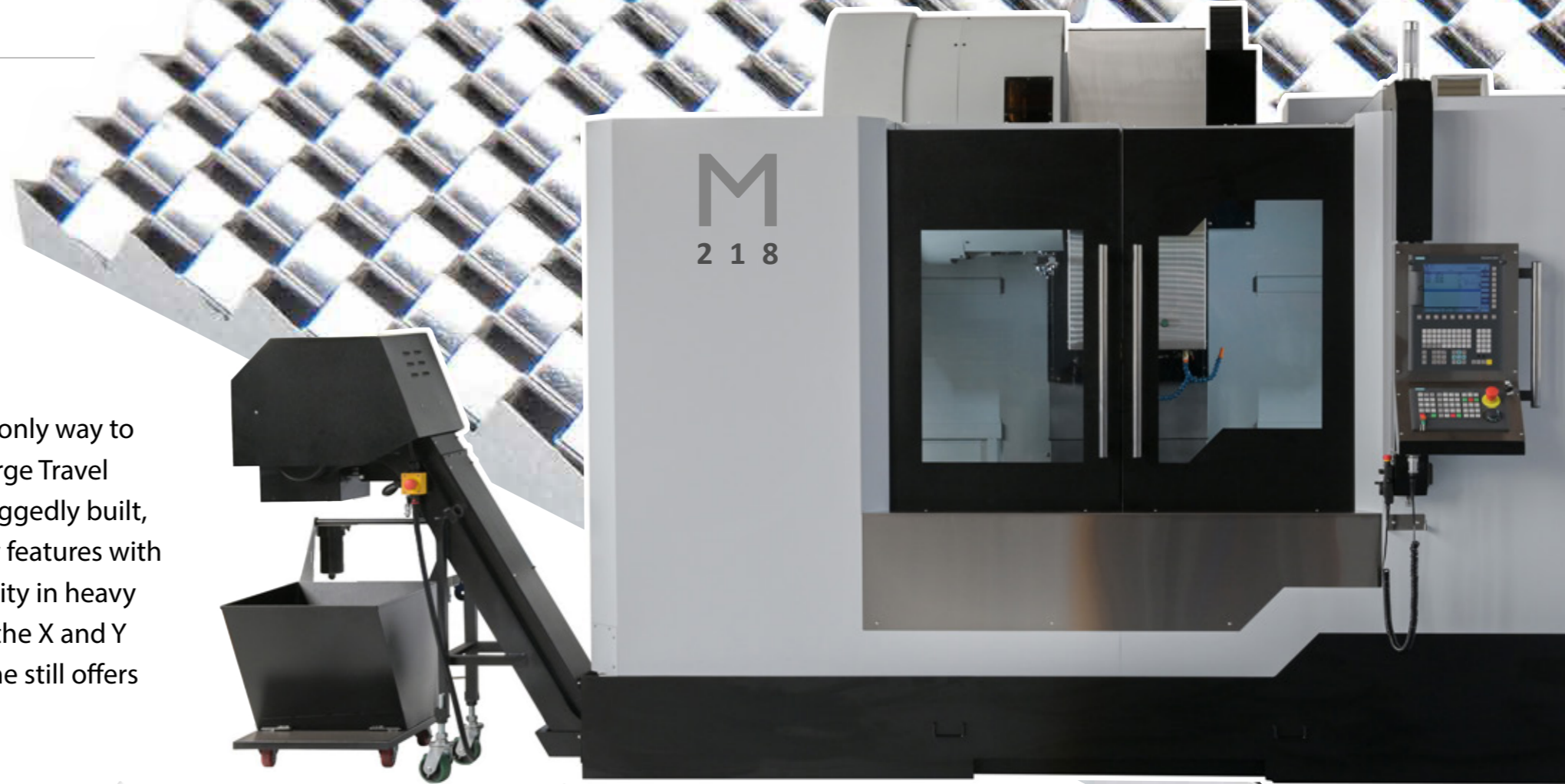
Large Travel Vertical Machine



MAPLE

RUGGED CONSTRUCTION PLUS EXTRAORDINARY DESIGN CONCEPTS

Reducing production costs while increasing productivity is the only way to keep an enterprise competitive. With the MAPLE M-Series of Large Travel Machining Center, you can obtain a competitive edge. These ruggedly built, high precision machining centers integrate many extraordinary features with unmatched performance. An oversized column enhances stability in heavy cutting. The extra long base eliminates overhang problems on the X and Y axes. Roller type linear ways are on three axes...and the machine still offers much more.



WIDE RANGE CUTTING CAPACITY

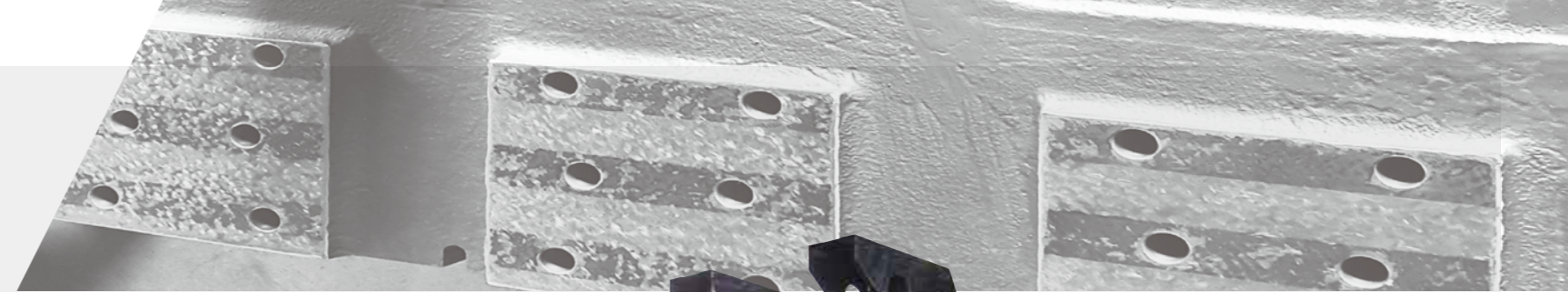


APPLICABLE INDUSTRIES

- Machine parts machining
- Automotive and motorcycle
- Mold and die machining
- Aerospace



UNIQUE ONE-PIECE DESIGN T-BASE STRUCTURE



A / EXTRA-LARGE BALL SCREW

- Three axes feeds are transmitted through Ø50 mm large ball screws.
- Ball screws are preloaded to effectively suppresses thermal deformation while ensuring high feed accuracy.

B / CHIP AUGERS LAYOUT

The twin chip augers are fitted in the channels of the base casting, located at the front and rear side of the base

C / AIR-CYLINDER COUNTER-BALANCE ON Z-AXIS (STANDARD)

- Z-axis movement is counter-balanced with the use of two air cylinders, leading to effortless, smooth and stable movement of Z-axis.
- The pneumatic system is equipped with an accumulator for stable supply of air pressure, allowing air cylinder motions to be more stable.

D / REINFORCED COLUMN STRUCTURE

The column is an oversized design in combination with optimal internal rib deployment, that offers the best dampening capability during heavy cutting while reducing the structural deformation to a minimum.

E / LARGE SIZED ROLLER TYPE LINEAR WAYS ON THREE AXES


- The linear ways feature high rigidity, high load-resistance, low friction coefficient and low noise.
- Rapid traverse rates on X, Y, Z-axes are 18M/min.
- Extra long heavy duty blocks on 3 axes.

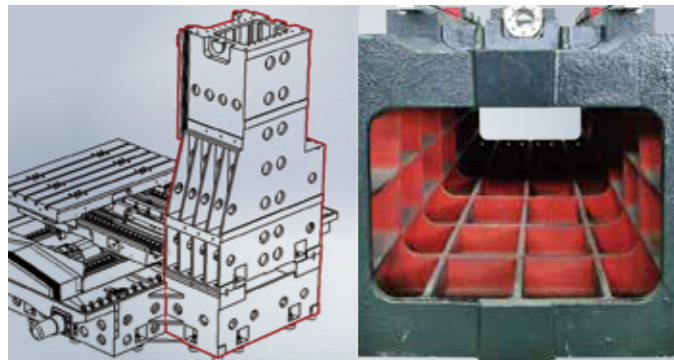


Model photo: M-186

STRUCTURAL RIGIDITY AND STABILITY DRAMATICALLY SURPASSES COMPETITIVE MODELS !

The design concepts behind Maple M-Series vertical machining centers is to enhance their exceptional heavy cutting capacity and increased machining efficiency as well. In particular, the column and base are exclusively designed to exhibit exceptional structural strength and machining stability.

BASE LENGTH 58% GREATER  **UP**
Compared to conventional machines The base length is 58% longer, and is the longest in its class. This leads to a higher level of stability.



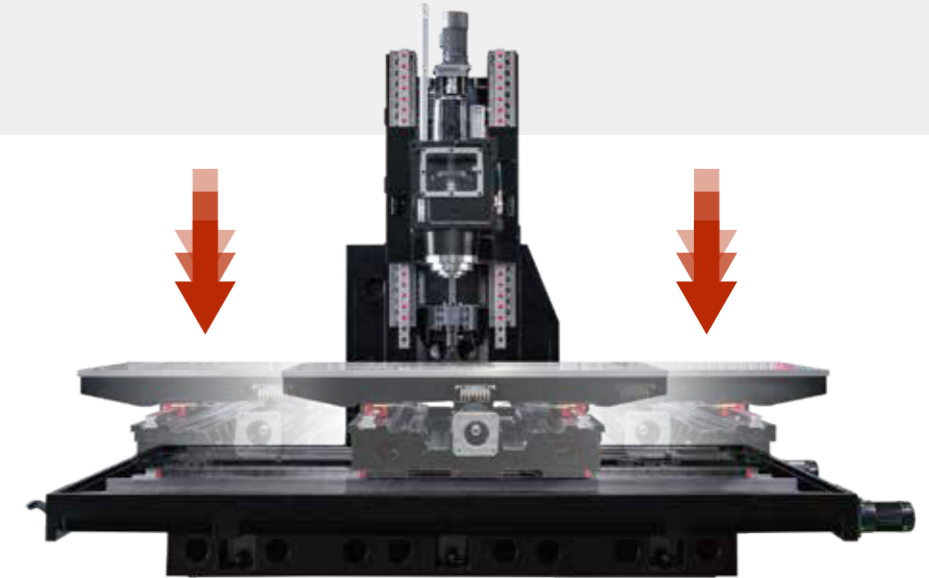
EXTRA LARGE COLUMN

The column is a box type construction, which is specially designed with reinforcement at the column bottom. This is combined with optimal internal ribbing with unique structural strength and rigidity to surpass conventional competitive models.



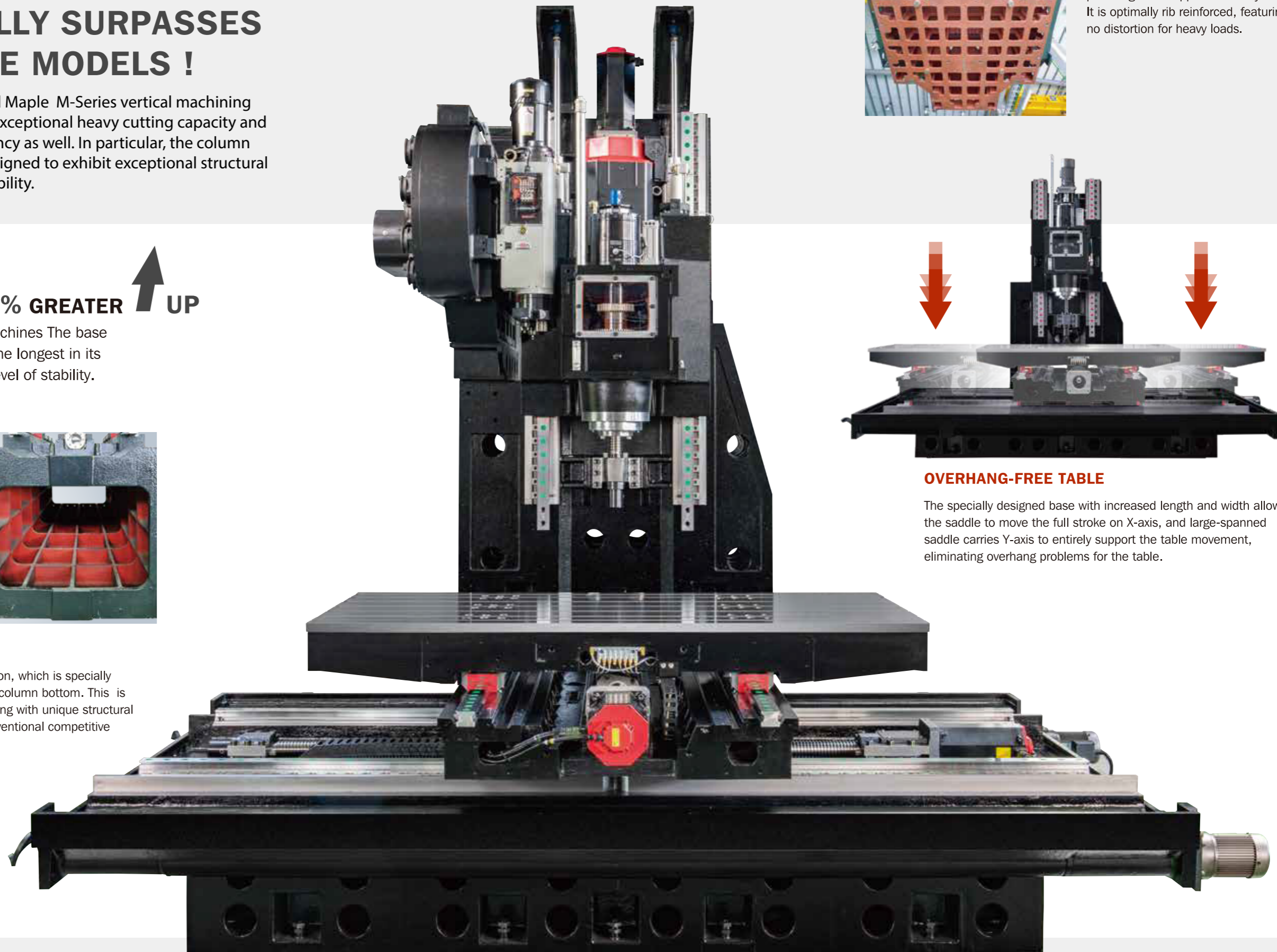
MASSIVE BASE

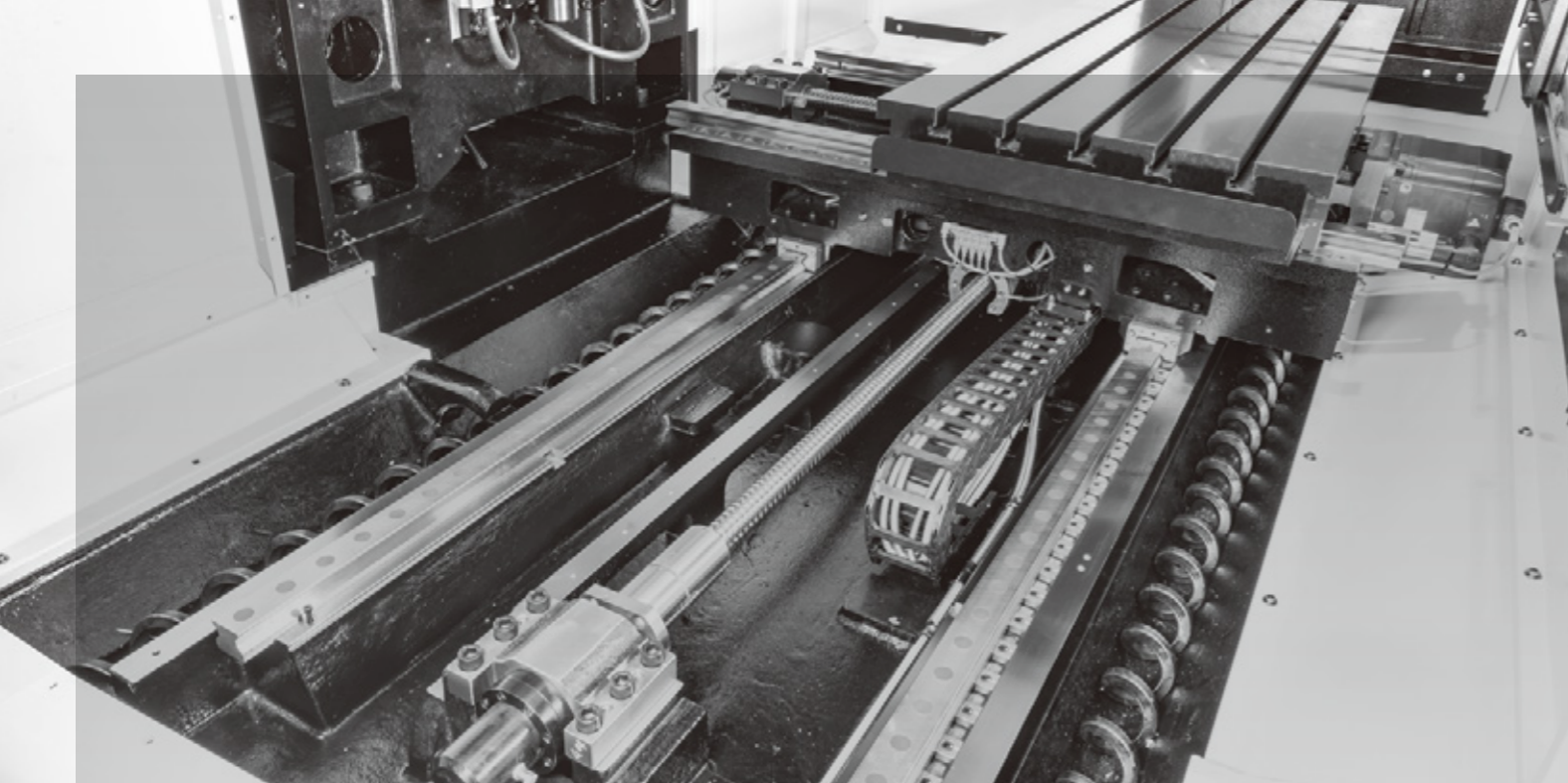
The base is an extra large structure, providing solid support for heavy loads. It is optimally rib reinforced, featuring no distortion for heavy loads.



OVERHANG-FREE TABLE

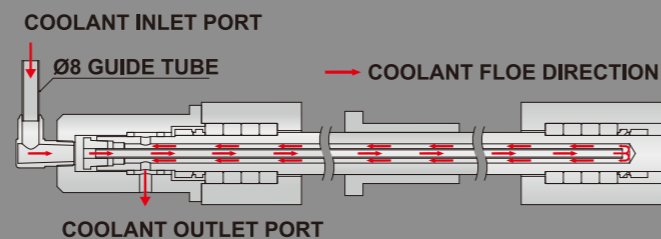
The specially designed base with increased length and width allows the saddle to move the full stroke on X-axis, and large-spanned saddle carries Y-axis to entirely support the table movement, eliminating overhang problems for the table.





COOLING THROUGH BALL SCREW (OIL)-Option

By employing cooling through X, Y, Z axis ball screws, the thermal expansion of the ball screws is minimized, helping to maintain high machining accuracy and stability of axial movement.



HIGHLY RIGID THREE AXES PROVIDE FAST FEED



SUPER HIGH RIGIDITY ROLLER TYPE LINEAR WAYS ON 3-AXIS

- The X, Y, Z-axis are all mounted with heavy duty linear ways together with great span between linear ways, featuring high rigidity, low friction coefficient and outstanding dampening capability.
- Each linear way is equipped with extended extra heavy duty blocks for upgrading loading capacity and dynamic stability.



Model	Linear ways & blocks
M-188/218/2110	-X/Y/Z-axis: 2 x 55mm linear way
M-268/318/2610 3110/3610/4110	-X/Z-axis: 2 x 55mm linear way -Y-axis: 4 x 55mm linear way

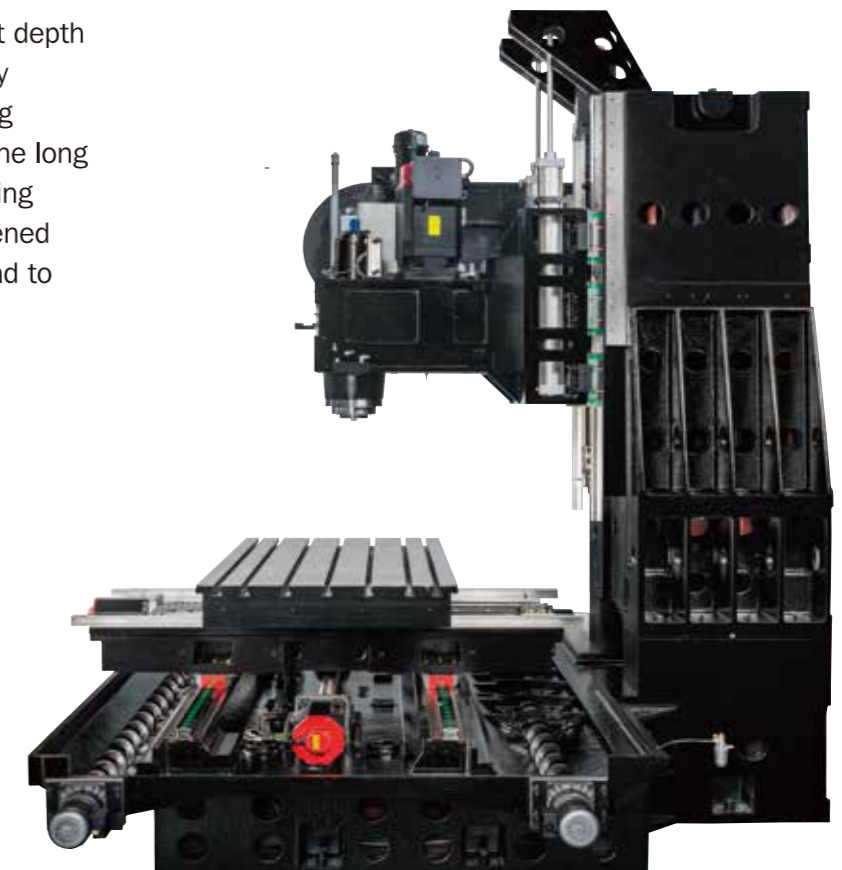


AUTOMATIC TOOL CHANGER

The tool magazine is independently mounted on the machine without a direct contact with the column, which eliminates vibration of the column while ensuring machining accuracy. The twin tool-change arm allows the operator to adjust the tool change speed for various tools. Besides, Maple also provides tool life management, big tool management and tool length measurement functions to ensure accuracy and dependability.

LONG THROAT DEPTH CREATES MORE WORKING SPACE

The golden ratio 1.2 : 1 of the throat depth to the height of spindle head strongly supports the spindle for heavy cutting without tilting problems. Moreover, the long throat depth provides ample machining space for parts. Maple has strengthened the vertical rigidity of the spindle head to assure machining accuracy.



MACHINING CAPACITY



FACE MILL

MATERIAL REMOVAL:
375 cc/min

- Tool : **63 mm**
- Material: S45C Steel
- Cut: 50 mm x 4 mm
- Feed Rate: 1875 mm/min
- Spindle Speed: 1500 rpm



END MILL

MATERIAL REMOVAL:
189 cc/min

- Tool : **63 mm**
- Material: S45C Steel
- Cut: 25 mm x 4 mm
- Feed Rate: 1890 mm/min
- Spindle Speed: 1800 rpm



DRILL

MATERIAL REMOVAL:
282 cc/min

- Tool : **40 mm**
- Material: S45C Steel
- Diameter Cut: 40 mm
- Feed Rate: 225 mm/min
- Spindle Speed: 1500 rpm

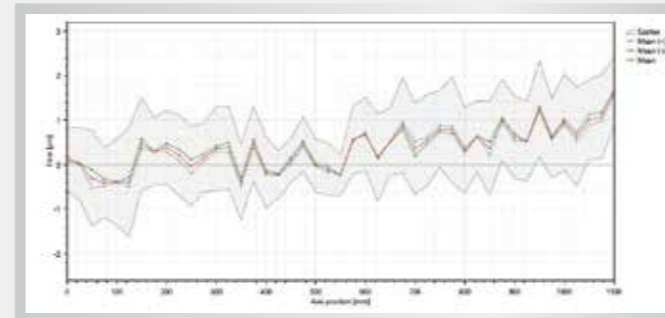


TAP

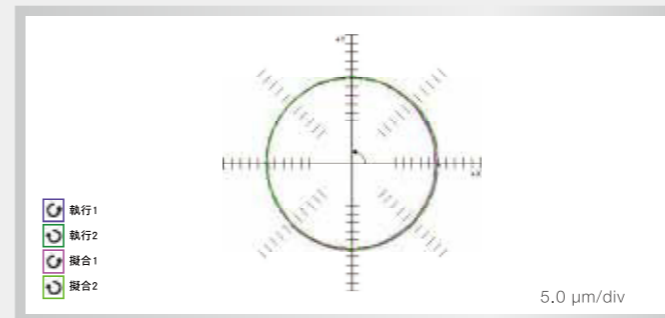
- Tool : **30 x 3.5 mm**
- Material: S45C Steel
- Width Cut: 30 mm
- Feed Rate: 348 mm/min
- Spindle Speed: 128 rpm



ACCURACY



E.g. X Axis Laser Compensation under 5 microns.



E.g. XY Double Ball Bar Test Results under 5 microns.

Maple performs cutting tests in circle, square and diamond shapes to ensure a maximum tolerance under 0.005 mm.

Linear X - Analysis features	VDI 3441
Name	Value (µm)
Maximum reversal (U max)	0.4
Maximum scatter (Ps max)	2.3
Positional uncertainty (P)	4
Positional deviation (Pa)	2
Mean reversal	0.1
Mean scatter (Ps mean)	1.6

Ball Bar - Diagnostics (XY 360 degree 15 mm)	
20% Reversal spike Y	↑ 1.2 µm ↓ 1.2 µm
17% Reversal spike X	↑ 0.1 µm ↓ -1.1 µm
12% Backlash Y	↑ 0.1 µm ↓ -0.7 µm
8% Straightness	1 µm
Circularity	3.9 µm

GUARANTEED PERFORMANCE THROUGH RIGOROUS QUALIFIED INSPECTION

* BT40 Direct drive spindle (ail 12/12000)

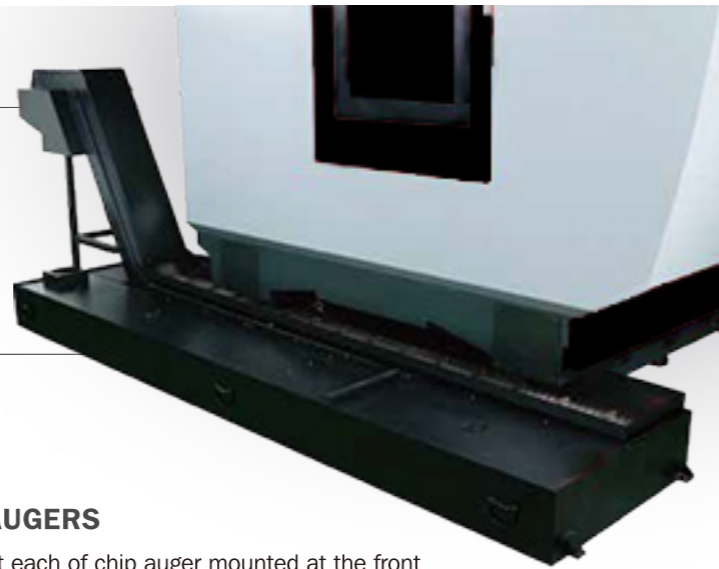
M-Series Machine Specification

		M-188	M-218	M-268	M-318	M-2110	M-2610	M-3110	M-3610	M-4110
TABLE										
Table Size	mm	1900 x 860 (74.8 x 33.8)	2200 x 860 (86.6 x 33.8)	2700 x 860 (106.3 x 33.8)	3200 x 860 (126 x 33.8)	2200 X 1060 (86.6 x 41.7)	2700 X 1060 (106.3 x 41.7)	3200 X 1060 (126 x 41.7)	3700 X 1060 (145 x 41.7)	4200 X 1060 (165 x 41.7)
T-Slot (No. x Size x Pitch)	mm	5 x 22 x 150 (5 x 0.87" x 5.91")	5 x 22 x 150 (5 x 0.87" x 5.91")	5 x 22 x 150 (5 x 0.87" x 5.91")	5 x 22 x 150 (5 x 0.87" x 5.91")	6 x 22 x 150 (6 x 0.87" x 5.91")	6 x 22 x 150 (6 x 0.87" x 5.91")	6 x 22 x 150 (6 x 0.87" x 5.91")	6 x 22 x 150 (6 x 0.87" x 5.91")	6 x 22 x 150 (6 x 0.87" x 5.91")
Max. Table Load	kg	2500	2800	3100	3400	2800	3100	3400	3700	4000
TRAVEL										
X-Axis	mm/inch	1800 (70.8)	2100 (82.7)	2600 (102.3)	3100 (122)	2100 (82.7)	2600 (102.3)	3100 (122)	3600 (141)	4100 (161)
Y-Axis	mm/inch	860 (33.8)	860 (33.8)	860 (33.8)	860 (33.8)	1060 (41.7)	1060 (41.7)	1060 (41.7)	1060 (41.7)	1060 (41.7)
Z-Axis	mm/inch	850 (33.4)	850 (33.4)	850 (33.4)	850 (33.4)	850 (33.4)	850 (33.4)	850 (33.4)	850 (33.4)	850 (33.4)
Spindle Nose to Table Surface-Taper 40	mm/inch	200-1050 (7.87~41.3)	200-1050 (7.87~39.7)	200-1050 (7.87~39.7)	200-1050 (7.87~39.7)	200-1050 (7.87~39.7)	200-1050 (7.87~39.7)	200-1050 (7.87~39.7)	200-1050 (7.87~39.7)	200-1050 (7.87~39.7)
Spindle Nose to Table Surface-Taper 50	mm/inch	150-1000 (5.9~39.3)	150-1000 (5.9~39.3)	150-1000 (5.9~39.3)	150-1000 (5.9~39.3)	150-1000 (5.9~39.3)	150-1000 (5.9~39.3)	150-1000 (5.9~39.3)	150-1000 (5.9~39.3)	150-1000 (5.9~39.3)
MOTOR										
Spindle Motor (kw)-Mitsubishi	kw	11/15	11/15	11/15	11/15	11/15	11/15	11/15	11/15	11/15
Spindle Motor (kw)-Fanuc	kw	15/18.5	15/18.5	15/18.5	15/18.5	15/18.5	15/18.5	15/18.5	15/18.5	15/18.5
Spindle Motor (kw)-Siemens	kw	17	17	17	17	17	17	17	17	17
Spindle Motor (kw)-Heidenhain	kw	20	20	20	20	20	20	20	20	20
X/Y/Z-Axis Servo Motor (kw)-Mitsubishi	kw	4.5/4.5/4.5BS	4.5/4.5/4.5BS	7.0/4.5/4.5BS	7.0/4.5/4.5BS	4.5/4.5/4.5BS	7.0/4.5/4.5BS	7.0/7.0/4.5BS	7.0/7.0/4.5BS	7.0/7.0/4.5BS
X/Y/Z-Axis Servo Motor (kw)-Fanuc	kw	3.0/3.0/3.0BS	3.0/3.0/3.0BS	3.0/3.0/3.0BS	3.0/3.0/3.0BS	3.0/3.0/3.0BS	3.0/3.0/3.0BS	3.0/3.0/3.0BS	3.0/3.0/3.0BS	3.0/3.0/3.0BS
X/Y/Z-Axis Servo Motor (kw)-Siemens	kw	5.5/5.5/5.5BS	5.5/5.5/5.5BS	6.4/5.5/5.5BS	6.4/5.5/5.5BS	5.5/5.5/5.5BS	6.4/5.5/5.5BS	6.4/6.4/5.5BS	6.4/6.4/5.5BS	6.4/6.4/5.5BS
X/Y/Z-Axis Servo Motor (kw)-Heidenhain	kw	6.0/6.0/6.0BS	6.0/6.0/6.0BS	9.6/6.0/6.0BS	9.6/6.0/6.0BS	6.0/6.0/6.0BS	9.6/6.0/6.0BS	9.6/9.6/6.0BS	9.6/9.6/6.0BS	9.6/9.6/6.0BS
SPINDLE										
Spindle Taper		CAT/BT/SK/ISO/HSK-(40/50 Taper)								
Spindle Speed-Taper 40	rpm	10000	10000	10000	10000	10000	10000	10000	10000	10000
Spindle Speed-Taper 50	rpm	6000	6000	6000	6000	6000	6000	6000	6000	6000
FEED										
Rapid Feed Rate - X/Y/Z Axis	m/min (ipm)	18/18/18 (709/709/709 ipm)	18/18/18 (709/709/709 ipm)	15/18/18 (591/709/709 ipm)	15/18/18 (591/709/709 ipm)	15/15/15 (591/591/591 ipm)	12/15/15 (472/591/591 ipm)	12/15/15 (472/591/591 ipm)	10/15/15 (393/591/591 ipm)	10/15/15 (393/591/591 ipm)
Cutting Feed Rate - X/Y/Z Axis	mm/min (ipm)	1-10,000 (0.4~393 ipm)	1-10,000 (0.4~393 ipm)	1-10,000 (0.4~393 ipm)	1-10,000 (0.4~393 ipm)	1-10,000 (0.4~393 ipm)	1-10,000 (0.4~393 ipm)	1-10,000 (0.4~393 ipm)	1-10,000 (0.4~393 ipm)	1-10,000 (0.4~393 ipm)
ATC										
Tool Storage Capacity		40 Taper (24/30/32/40/60) / 50 Taper (24/30//40/60)								
Max. Tool Diameter x Length-mm	mm	40 Taper (75 x 250) / 50 Taper (105 x 350)								
Without Adjacent Tool (Diameter)-mm	mm	40 Taper (150) / 50 Taper (210)								
Max. Tool Weight	kgs	40 Taper (7) / 50 Taper (15)								
ACCURACY										
ISO 10791-2 (VDI/DGQ3441)	Positioning	0.014 mm (0.00055")			0.02 mm (0.00078")		0.014 mm (0.00055")		0.02 mm (0.00078")	
	Repeatability	0.010 mm (0.00039")			0.010 mm (0.00039")		0.010 mm (0.00039")		0.010 mm (0.00039")	
JIS-B 6338	Positioning	0.004/300 mm (0.00016"/11.81")			0.005/300 mm (0.0002"/11.81")		0.004/300 mm (0.00016"/11.81")		0.005/300 mm (0.0002"/11.81")	
	Repeatability	±0.003 mm (0.00012")			±0.005 mm (0.0002")		±0.003 mm (0.00012")		±0.005 mm (0.0002")	
GENERAL										
Power Requirement	kva	45	45	45	45	45	45	45	45	45
Pneumatic Supply	kg/cm2	6	6	6	6	6	6	6	6	6
Coolant Tank Capacity	L	540	540	540	540	650	650	650	650	650
Machine Net Weight	kgs	13000	14000	15000	16000	15000	16000	17000	18000	19000

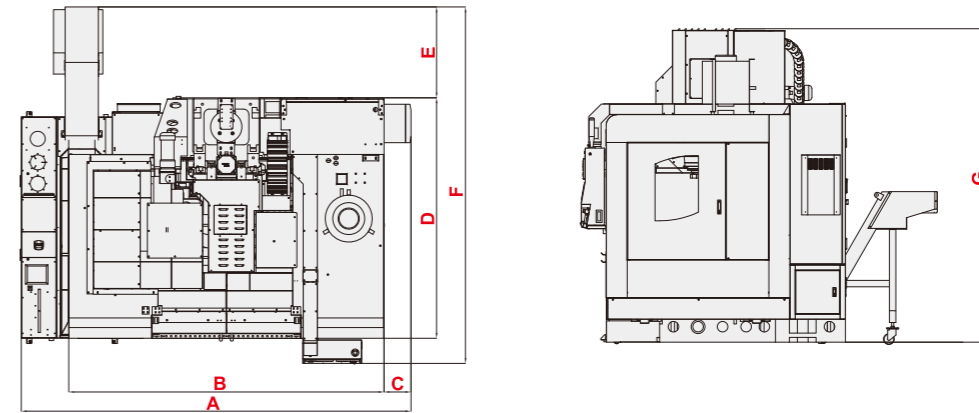
M-Series machines can be customized to each customer requirement.

LINK CHAIN TYPE CHIP CONVEYOR (OPTIONAL)

The chip conveyor and coolant tank are integrated and mounted at the left side of the machine for saving space.



MACHINE DIMENSIONS



Unit: mm

MODEL	A	B	C	D	E	F	G
M-188	4630	4300	125	4300	610	5215	3800
M-218	5130	4800	-	4300	610	5215	3800
M-268	5830	5500	-	4300	610	5215	3800
M-318	6530	6200	-	4300	610	5215	3800
M-2110	5130	4800	-	4600	610	5515	3800
M-3110	6530	6200	-	4600	610	5515	3800
M-3610	7230	6900	-	4600	610	5515	3800
M-4110	7930	7600	-	4600	610	5515	3800



TWIN CHIP AUGERS

- There is one set each of chip auger mounted at the front and rear side of the base, which can deliver chips generated during cutting to the chip conveyor at the back side of the machine.
- The chip augers may prevent thermal effect due to the deposited chips, and keep the machine interior clean at all times.



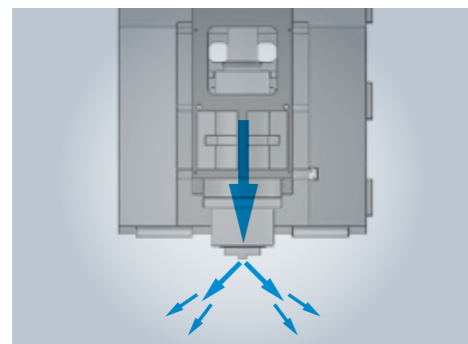
SPINDLE OIL COOLER

- The spindle oil cooler provides high efficiency cooling effect to the spindle and gearbox, enabling the spindle to maintain a constant temperature condition even when the machine performs long time continuous machining operations.
- It can avoid spindle thermal deformation and ensure machining accuracy as well as extend the spindle service life.



COOLANT NOZZLES AROUND SPINDLE

The function of the coolant jets around spindle is to quickly remove heat of the cutting tool and workpiece during cutting, so as to upgrade machining accuracy and extend the tool life.

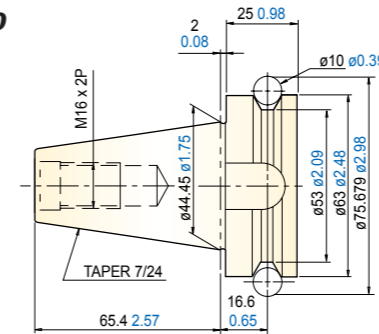


COOLANT THROUGH SPINDLE DEVICE (OPTIONAL)

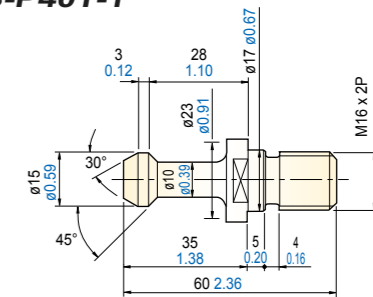
- The coolant through spindle device employs a high pressure and high flow rate pump, that discharges cutting fluid to the cutting position.
- Especially when performing high speed machining, deep drilling and deep milling, the coolant through spindle device helps to remove chips quickly, so as to upgrade machining accuracy and save machining time.

PULL STUD AND TOOL SHANK

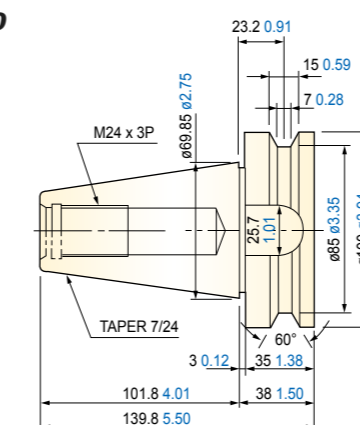
BT40



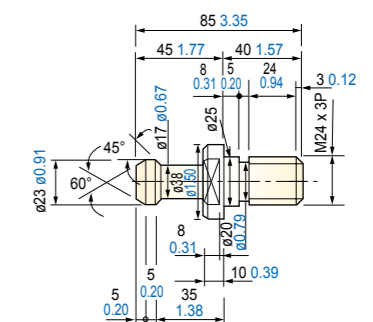
MAS-P40T-1



BT50



MAS-P50T-1



Unit : mm inch



MAPLE



Endless Innovation



MAPLE TECHNOLOGY CO.,LTD.
No.3-1, Zhongshan Rd., Shalu Dist.,
Taichung City 43348,
Taiwan R.O.C.
Tel:+886-4-26150200 Fax:+886-4-26153906
Website:www.maple-tech.com.tw