



Large Scale **5-Axis** Machining Solutions

## 5 Axis Machining Expert in

Aerospace Manufacturing  
Automotive Die & Mold

ASIA PACIFIC ELITE CORP.

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TTGroup

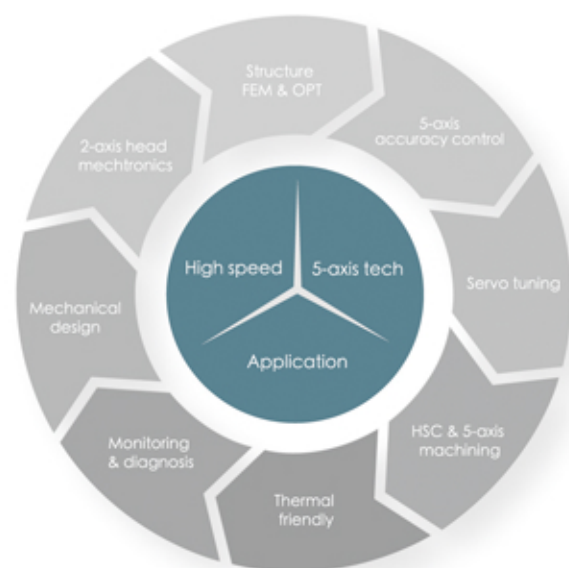


TTG · TONGTAI GROUP

## ASIA PACIFIC ELITE CORP.

**Your Best Partner  
We Offer You Full Application Support.**

APEC is the company that specializes in machining for Aerospace and Automobile industries. APEC team, by analyzing the processing demand from customers, not only recommends the suitable equipment but also provide the complete solutions. Thanks to revolutionary machine solutions, it help improve customer's machining efficiency and quality.



## Trust & Technology



TONGTAI GROUP

## TURSTABLE PARTNER

**for machining solution**

8 subsidiaries

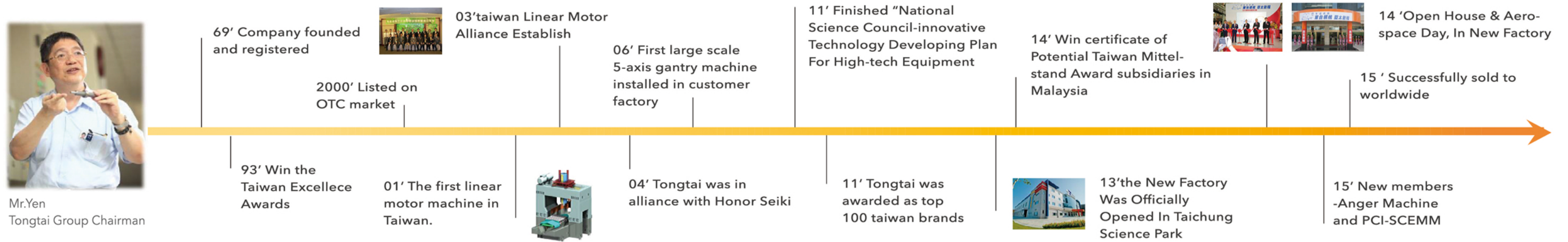
17 overseas branches

33 national network

150+ sales channels



## The Excellent Products & Services History



## Wide Range Of Application In Different Industries



Aerospace



Automotive



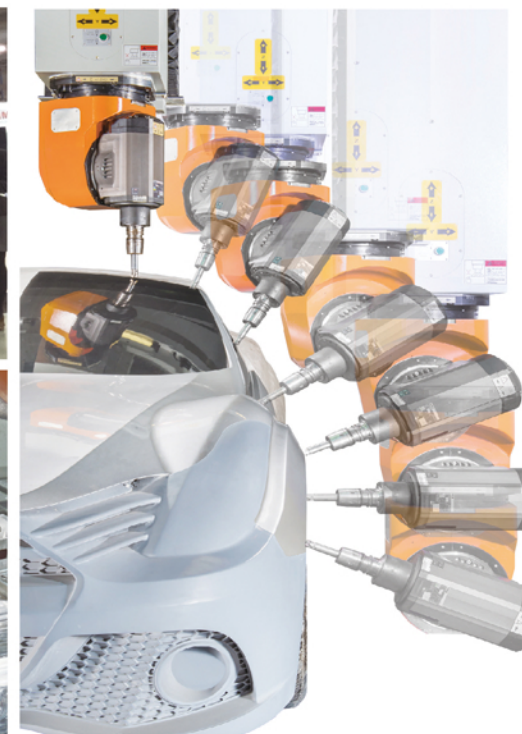
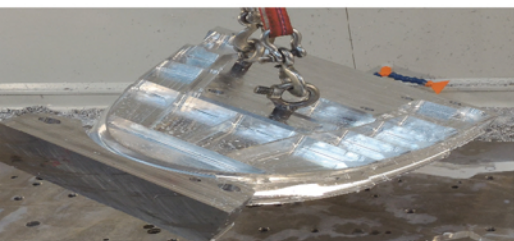
Marine



Railway



Energy





## Series

High efficiency machining  
5-axis High Speed Linear Motor Gantry Machining Center



Specifications	Unit	G Maglev	G Dyna
Travel			
X-axis	mm	2,000 / 2,500 / 3,000 / +EXTENSION 1,000	
Y-axis	mm	2,000 / 2,500 / 3,000 / 3,500 / 4,000	
Z-axis	mm	1,000 / 1,200 (option : 1,500 / 2,000)	
Distance from spindle nose to table surface	mm	20~20+ z axis stroke **1	
Table			
Table length	mm	2,000 / 2,500 / 3,000 / +EXTENSION 1,000	
Table width	mm	2,000 / 2,500 / 3,000 / 3,500	
T-slot size	mm	28	
max. table load	kg / m <sup>2</sup>	8,000	
Spindle			
Spindle taper		HSK 63	
Spindle speed	rpm	24,000	
Spindle power (S1 / S6)	kW	37 / 46	
Spindle torque (S1 / S6)	Nm	60 / 73	
2-Axis Head			
Max. swivel / rotation speed	rpm	B = 30	C = 30
Max. swivel / rotation torque (S1-100%)	Nm	B = 760	C = 800
Clamping torque	Nm	B = 2,100	C = 3,000
Swivel / rotation angle	degree	B = ±105°	C = ±200°
Traverse			
		Linear motor drive **2	Ball screw drive **3
Rapid traverse	m/min	X=60, Y=60 , Z=40	X=20, Y=20 , Z=20
X / Y / Z-axis acceleration	m/sec <sup>2</sup>	5	4
Accuracy			
		Maglev	Dyna
Positioning (VDI3441)	mm	3000≤L≤6000 / 0.015~0.025	
Repeatability (VDI3441)	mm	3000≤L≤6000 / 0.010~0.012	
Ball bar circularity	mm	XY / 0.015 XZ / 0.025 YZ / 0.025	XY / 0.025 XZ / 0.035 YZ / 0.035
Automatic Tool Chang			
Tool shank		HSK 63A	
Tool capacity		24	
Max. tool length	mm	300	
Max. tool diameter-with adjacent tool	mm	Ø100	
Max. tool diameter-without adjacent tool	mm	Ø180	
Max. tool weight	kg	7	
Others			
Machine weight	kg	35,000~65,000 (AND OVER)	

\*\* the distance from spindle nose to table can be customized

\*\* Maglev models : If X travel ≥ 6,000 mm, X-axis motion is driven by rack & pinion

\*\* Dyna models : If X travel ≥ 6,000 mm, X-axis motion is driven by rack & pinion, and YZ-axis motion driven by ball screw.

\*\* All specifications and designs are subjected to change without notice.

### Optional accessories

- Siemens 840D CNC controller
- HEIDENHAIN iTNC 640
- 2-axis head with HSK 63A 18,000 rpm
- 2-axis head with HSK 100A 12,000 rpm
- Automatic tool changer 40 / 60 / 80 / 120 tools
- Dryer for spindle
- Coolant through spindle 20 / 70 bar
- Coolant around spindle nose
- External coolant supply unit
- Tool measuring system
- Workpiece measurement system
- Automatic voltage regulator
- Coolant tank with pumps
- Chip cart
- Auto measurement and compensation for 5 axes



## Series

High Precision machining  
5-axis High speed Linear Motor Drive Gantry Machining Center



www.apecnc.com

BOX in BOX design

Specifications		GM2750	GM3260	GM3780
Travel				
X-axis	mm	5,000	6,000	8,000
Y-axis	mm	2,700	3,200	3,700
Z-axis	mm	1,000/1,300		
Distance between spindle nose to table surface	mm	100-1,100 (Opt. 100-1,400)		
Table				
Table length	mm	5,000	6,000	8,000
Table width	mm	2,500	3,000	3,500
Max. table load	kg/m <sup>2</sup>	8,000		
Spindle				
Spindle taper		HSK 63A		
Spindle speed	rpm	24,000		
Spindle power (S1/S6)	kW	37/46		
Spindle torque (S1/S6)	Nm	60/73		
2-Axis Head				
Max. swivel/rotation speed	rpm	B=30 C=30		
Max. swivel/rotation torque (S1-100%)	Nm	B=760 C=800		
Clamping torque	Nm	B=2,100 C=3,000		
Swivel / rotation angle	degree	B=±105° C=±200°		
Traverse				
Rapid traverse	m/min	XYZ=60		
Acceleration	m/sec <sup>2</sup>	XYZ=5		
Automatic Tool Chang				
Tool magazine capacity	pc	30		
Max. tool length	mm	300		
Max. tool diameter -with adjacent tools	mm	Ø100		
Max. tool diameter -without adjacent tools	mm	Ø200		
Max. tool weight per piece	kg	7		
Others				
Power supply	kVA	200		
Machine weight	kg	67,000	84,030	99,230

\*\* All specifications and designs are subject to change without notice.

### Standard accessories

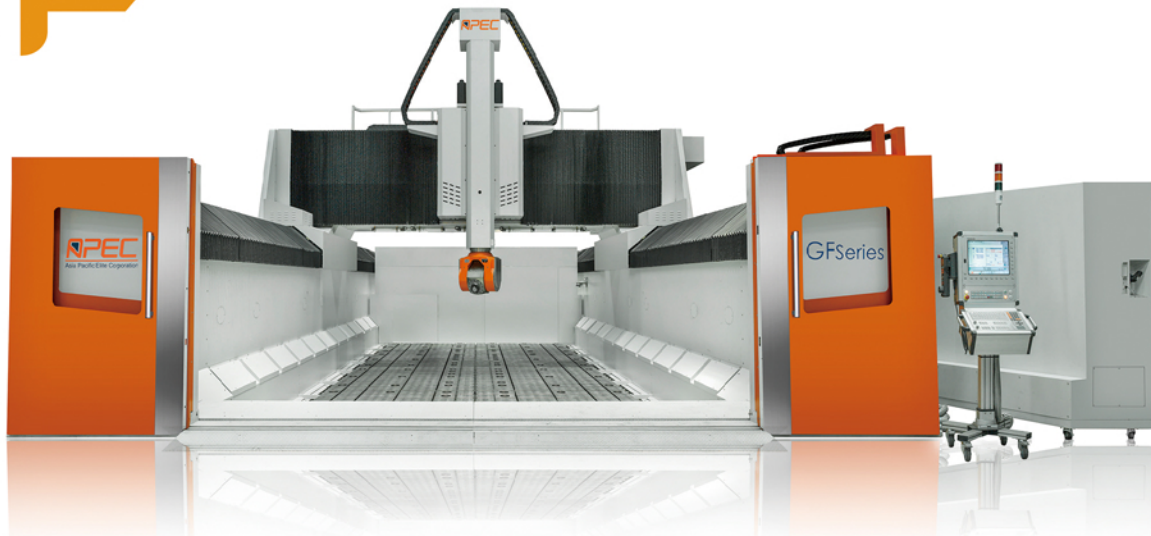
- Heidenhain iTNC530 CNC controller
- 2-axis head with HSK 63A 24,000 rpm
- Automatic tool magazine 30 tools
- X/Y/Z-axis with linear motor drive
- X/Y/Z-axis with air conditioner for linear motors
- X/Y/Z-axis with Heidenhain linear scales
- X/Y/Z-axis with roller linear guideways
- X/Y/Z-axis with brake system
- Air conditioner for spindle
- Spindle lubrication system
- Counter balance system
- Manual pulse generator
- Air conditioner for electrical cabinet
- Auger type chip conveyor
- Chip conveyor
- Transformer
- Security door interlocks
- Waterproof working lamp
- Full-enclosure splash guard (without roof)

### Optional accessories

- 2-axis head with HSK 63A 18,000 rpm
- 2-axis head with HSK 100A 12,000 rpm
- Automatic tool changer 40 / 50 tools
- Coolant through spindle 20 / 70 bar
- Coolant around spindle nose
- Dryer for spindle
- Tool measuring system
- Workpiece measurement system
- Automatic voltage regulator
- Coolant tank with pumps
- Chip cart
- X-axis travel extends per meter

GF

Series

Large scale heavy cutting  
Ultra Large 5-axis High Speed Gantry Machining Center

Specifications	Unit	GF40 GF50 GF60	
Travel			
X-axis	mm	6,000-30,000	
Y-axis	mm	4,000 / 5,000 / 6,000	
Z-axis	mm	1,000 / 1,300 / 1,500	
Distance between spindle nose to table surface	mm	100-1,100 100-1,400 100-1,600	
Distance between side walls	mm	5,525 / 6,525 / 7,525	
Table			
Table length	mm	6,000 - 30,000	
Table width	mm	4,000 / 5,000 / 6,000	
T-slot size	mm	28	
Max. table load	kg/m²	8,000	
Spindle			
Spindle taper		HSK 63A	HSK 100A
Spindle speed	rpm	24,000	12,000
Spindle power (S1/S6)	kW	37 / 46	53 (S1)
Spindle torque (S1/S6)	Nm	60 / 73	225 (S1)
2-Axis Head			
Max. swivel / rotation speed	rpm	B=30 C=30	B=30 C=30
Max. swivel / rotation torque	Nm	B=760 C=800	B=1,200 C=2,650
Clamping torque	Nm	B=2,160 C=3,024	B=4,680 C=6,000
Swivel / rotation angle	degree	B=±105° C=±200°	B=±120° C=±200°
Traverse			
Rapid traverse	m/min	XYZ=40	
Max. acceleration	m/sec²	XYZ=4	
Automatic Tool Chang			
Tool magazine capacity	pcs	40	
Max. tool length	mm	300	400
Max. tool dimensions-with adjacent tools	mm	Ø100	Ø125
Max. tool dimensions-without adjacent tools	mm	Ø200	Ø250
Max. tool weight	kg	7	12
Others			
Power supply	kVA	150	

X-axis traver can be incremented per 2 meters.

※ All specifications and designs are subjected to change without notice.

MDU

Series

High rigidity heavy cutting  
Heavy Duty 5-axis Machining Center

www.apeccnc.com

Specifications	Unit	MDU-2000 / 2500
<b>Travel</b>		
X-axis	mm	2,000 / 2,500 (excluding APC travel)
Y-axis	mm	2,000 / 2,500
Z-axis	mm	800
W-axis	mm	600
Distance between two columns	mm	2,000 / 2,500
Distance between spindle nose to table surface	mm	B-axis 0°= 200~1,000 B-axis 90°= 500~1,300
<b>Spindle</b>		
Spindle taper		CAT50 / HSK100A
Spindle speed	rpm	3,000 / 5,000
Spindle power (S1/S6)	kW	30 / 36
Spindle torque (S1/S6)	Nm	840 / 1,000
<b>Swivel head (B-axis)</b>		
Swivel speed	rpm	10
Swivel torque (S1/S6)	Nm	3,200 / 3,700
Clamping torque	Nm	5,000
Swivel angle	deg	±110°
<b>Rotary working table (C-axis)</b>		
Rotate speed	rpm	5
Rotate torque	Nm	8,500 / 29,000
Clamping torque	Nm	16,000
Rotate range	deg	360° (cont.)
Max. table size	mm	1,250 x 1,250
Table load	kg	4,000
<b>Traverse</b>		
Rapid traverse	m/min	XYZ=10
<b>Automatic Tool Chang</b>		
Tool magazine capacity	pcs	60
Max. tool diameter -with adjacent tool	mm	Ø125
Max. tool diameter -without adjacent tool	mm	Ø250
Max. tool weight per piece	kg	25
Max. tool length	mm	400

※ All specifications and designs are subjected to change without notice.

**Standard accessories**

- Siemens Sinumerik 840D controller
- Automatic tool magazine 60 tools
- 5-axis with Heidenhain linear scales
- X/Y/Z-axis with boxway
- German made ZF gear box
- Air conditioner for electrical cabinet
- Chiller for spindle
- Counter balance system
- Manual pulse generator
- Auger type chip conveyor
- Chip conveyor
- Transformer
- Security door interlock
- Waterproof lamp
- Full-enclosure splash guard (without roof)

**Optional accessories**

- Heidenhain iTNC530 CNC controller
- Spindle speed with 5,000 rpm
- Coolant through spindle 20/70 bar
- Coolant around spindle nose
- Inverter cooling system
- Automatic voltage regulator
- Automatic tool change 120 tools
- Tool management system
- Coolant tank with pumps
- Oil skimmer with anti-bacterial filtering system
- Oil mist collector
- Oil mist filter system
- Chip cart
- Laser tool measuring system
- Workpiece measuring-wireless data transmission
- Workpiece profile inspection system
- Auto 5-axis accuracy calibration system
- Flexible manufacturing system
- Automatic pallet exchanger
- Mill-Turn integration (Please contact sales for more details.)
- Full-enclosure splash guard (with roof)

MT

Series

High Speed heavy cutting  
Double Column Machining Center

Specifications	unit	MT24			
		3 axis	3+2 axis	5 axis	5 face
Travel					
X-axis	mm		3,200 / 4,200 / 5,200		
Y-axis	mm	2,300	2,500 / 3,000		3,000
Z-axis	mm		1,000 (Opt. 1,200)		
Distance between two columns	mm		2,400		
Distance from spindle end to table	mm	200~1,200	30~1,030 (HSK63A)		200~1,200
Table					
Table length x Table width : table load	mm : tons	3,000 x 2,060 : 12T / 4,000 x 2,060 : 14T / 5,000 x 2,060 : 16T			
Traverse					
Feedrate	m/min	XYZ=20			
Spindle					
Spindle taper		HSK 63A / 100A			#50
Spindle speed	rpm	20,000	18,000		6,000
Spindle power (S1/S6)	kW	30 / 38	35 / 42		22 / 26
Spindle torque (S1/S6)	Nm	87.9 / 123.8	56 / 67		low (543 / 642) high (136 / 160)
Positioning head					
A / C-axis motor torque	Nm	—	416 / 309		—
A / C-axis clamping torque	Nm	—	4,000		—
A / C-axis indexing	deg	—	0.1° fixed indexing (0.001° opt.)	continuous indexing	C-axis, C=360° 5° (2.5° opt.)
Swivel / rotation angle	deg	—	A=±125° C=±200°		—
Automatic Tool Chang					
Type of tool magazine		vertical			vertical & horizontal
Tool magazine capacity	pcs	32 / 40 / 60 (opt.)			

## Standard accessories

- Heidenhain iTNC530 CNC controller (for 3+2 axes or 5 axes)
- 2-axis head with HSK63A/18,000rpm/35kW/56Nm (for 3+2 axes or 5 axes)
- Automatic tool magazine with vertical tool changer 32 tools
- XYZ-axis with linear scale (for 3+2 axes or 5 axes)
- Oil cooler
- Air blast through spindle
- Auto lubrication device
- Coolant device
- Hydraulic unit
- Manual pulse generator
- Working light
- 3-color signal lamp
- Twin chip augers on table side
- Caterpillar type chip conveyor
- Auto power-off device
- RS-232 interface
- Air conditioner for electrical cabinet
- Pad & adjusting bolt
- Tool kits
- Accuracy report
- Operation manual
- PLC & electrical circuit diagram

## Optional accessories

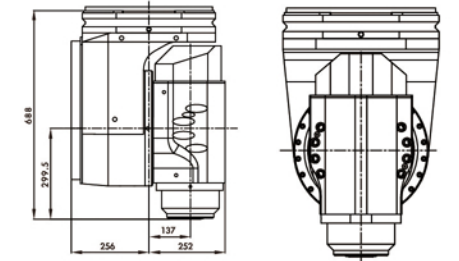
- FANUC / SIEMENS CNC controller (for 3 axes)
- 6,000rpm gear head spindle (for 3 axes)
- 15,000rpm spindle with 25kW/200Nm (for 3 axes)
- 2-axis head with HSK63A/24,000rpm/35kW/56Nm (for 3+2 axes or 5 axes)
- 2-axis head with HSK100A/15,000rpm/25kW/119Nm (for 3+2 axes or 5 axes)
- 2-axis head with HSK100A/12,000rpm/25kW/119Nm (for 3+2 axes or 5 axes)
- German made 2-axis head (for 3+2 axes or 5 axes)
- Auto vertical tool changer 40/60 tools
- Coolant through spindle system
- Auto tool measuring system
- Auto workpiece measuring system
- Mist cooling device
- Transformer
- Enclosure splash guard (without roof / with roof)
- Auto 5-axis measurement & compensation
- Chip cart
- Coolant through spindle system 20 / 70 bar

## 5-Axis Head

## Mono Supporting Type Head



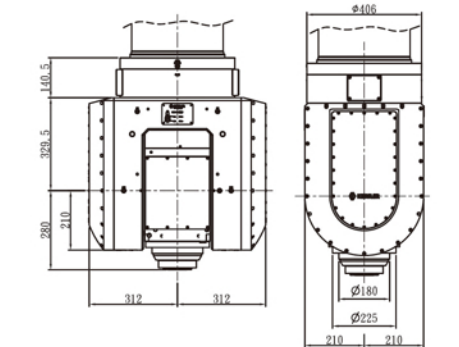
Spindle Taper	HSK63A		HSK100A	
Tool Clamping	Auto Clamping			
Spindle Speed	18,000	24,000	12,000	15,000
Spindle Power	35 / 42 kW		25 / 30 kW	
Spindle Torque	56 / 67 Nm		119 / 143 Nm	
Indexing	Continuous / Indexing 0.001			
Swivel / Rotating Angle	A= ± 125°		C= ± 200°	
Clamping Torque	A= 4,000Nm C= 4,000Nm			



## Fork Type Head



Spindle taper	HSK63A		HSK100A
Spindle speed	18,000 / 20,000 24,000 / 30,000 rpm		15,000 rpm
Spindle power	(56/70 kW)/18,000 (37/46 kW)/20,000 (37/46 kW)/24,000 (60/75 kW)/30,000		45/45 kW
Spindle torque	(89/111 Nm)/18,000 (60/73 Nm)/20,000 (60/73 Nm)/24,000 (60/75 Nm)/30,000		120 / 144 Nm
Max. swivel / rotation speed	B = 30rpm C = 30rpm		
Swivel / Rotating Angle	B = ±105° C = ±200°		

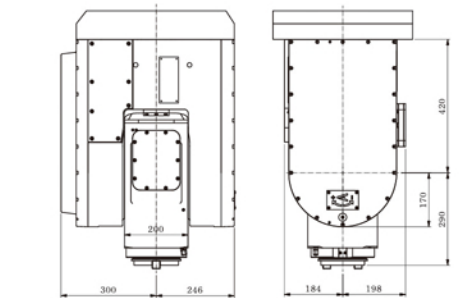


## High torque head for Titanium/Inconel Machining

Fork type 2-axis / 1-axis head heavy duty 5-axis machining for titanium/inconel alloy

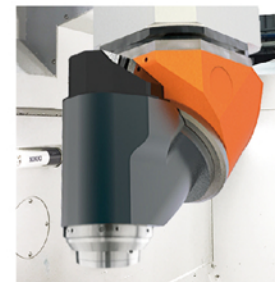


Spindle Taper	CAT50	
Tool Clamping	Auto Clamping	
Spindle Speed	3,000	
Spindle Power	37 / 44 kW	
Spindle Torque	840 / 1000 Nm	
Swivel Speed	10 rpm	
Swivel Torque (S6)	3,200 Nm	
Swivel / Rotation angle	+ 110	

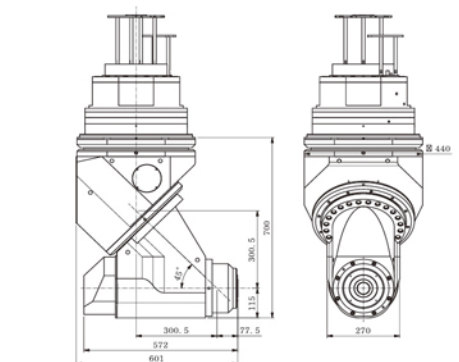


## Automatic head system

2-axis universal head for multi-purpose machining



Spindle Taper	HSK63A		HSK100A	
Tool Clamping	Auto Clamping			
Spindle Speed	18,000	24,000	12,000	15,000
Spindle Power	35 / 42 kW		25 / 30 kW	
Spindle Torque	56 / 67 Nm		119 / 143 Nm	
Indexing	Continuous / Indexing 0,001			
Swivel / Rotating Angle	A= ± 125°		C= ± 200°	
Clamping Torque	A= 4,000Nm C= 4,000Nm			

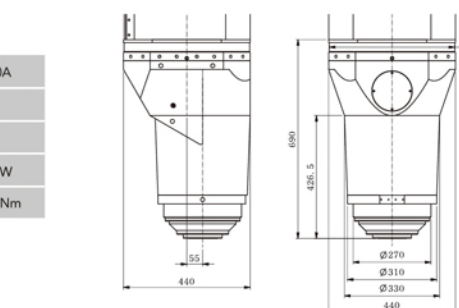


## Automatic head exchanging system

vertical heavy duty spindle



Spindle Taper	HSK63A	HSK100A
Tool Clamping	Auto Clamping	
Spindle Speed	20,000	12,000
Spindle Power	35 / 42 kW	54 / 70 kW
Spindle Torque	56 / 67 Nm	262 / 343 Nm



# Together To Grow

customer reference

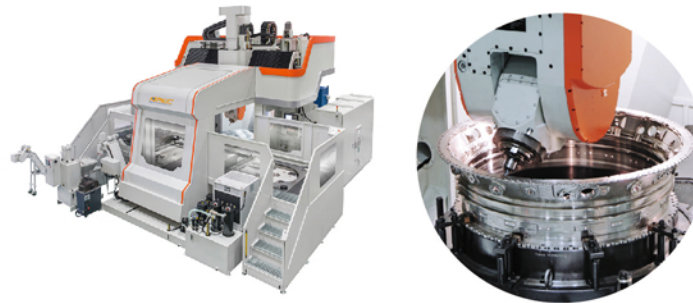
## AEROSPACE INDUSTRIAL DEVELOPMENT CORPORATION

AIDC, Aerospace Industrial Development Corporation, is the biggest aerospace manufacturing company in Taiwan. And is also the Tier 1 supplier for Boeing, Airbus, GE aviation, Rolls Royce...etc. Right now it is the top subcontractor of CFM Leap series and Roll Royce Trent series civil aero engine.

Most of turbine casing made of Nickle based alloy INCONEL and Titanium alloy. Hard-to-cut materials need very good machine body rigidity and high power high torque spindle to shorten the machining time and increase the surface quality.

APEC MDU-2000W is a special machine for such kind of aero engine casing parts manufacturing. We knew the detailed process and bottle neck of current machine, then we developed and built up new generation heavy duty 5-axis machine for engine casing. Thanks to its revolutionary design, it can offer 1000Nm spindle torque capacity with excellent compact size to get inside the casing to do the 5-axis heavy machining directly without any attachment change and recalibration. Full axes with wide box way design plus cross beam movement can offer very good machine rigidity. Under 160mm cutter with cutting depth 7mm, feedrate 764mm/min on carbon steel JIS S45C, MDU-2000W can reach excellent surface quality Ra 0.7 with high chip removal rate 738 c.c./min.

After years of virefication, it proved MDU-2000W can offer better machine rigidity and machining efficiency than Germany and USA machine. Now APEC became a very important strategic partner of AIDC and together to grow with AIDC toward global aerospace market.



## CHYAN FENG GROUP ( CFG )

CFG is leader stamping die company in Taiwan. CFG's clients include world well-known car maker such as Ford, Mazda, Nissan, Mitsubishi...etc. Before CFG applied APEC GM box-in-box gantry type full linear motor driving 5 axis machine, they paid a lot of time on both machining and manual polishing.

After using APEC GM machine, they can increase their finishing cutting feedrate from 5~6 m/min to 12 m/min. And thanks to the high performance of GM machine, even cutting feedrate 12m/min, it can offer quite excellent surface quality. It help save manual polishing time more than 50%. Another key improvement, they applied many 5-axis continuous machining on corner cleaning and surface finishing that will help reduce considerable machining time.

GM machine equipped with touch probe, and 3D workpiece measurement software (option). CFG can execute die surface contour accuracy inspection, compare to original 3D model. They can get high quantity of measuring data and built their database gradually. According to the data base, CFG can control their upstream and downstream process.

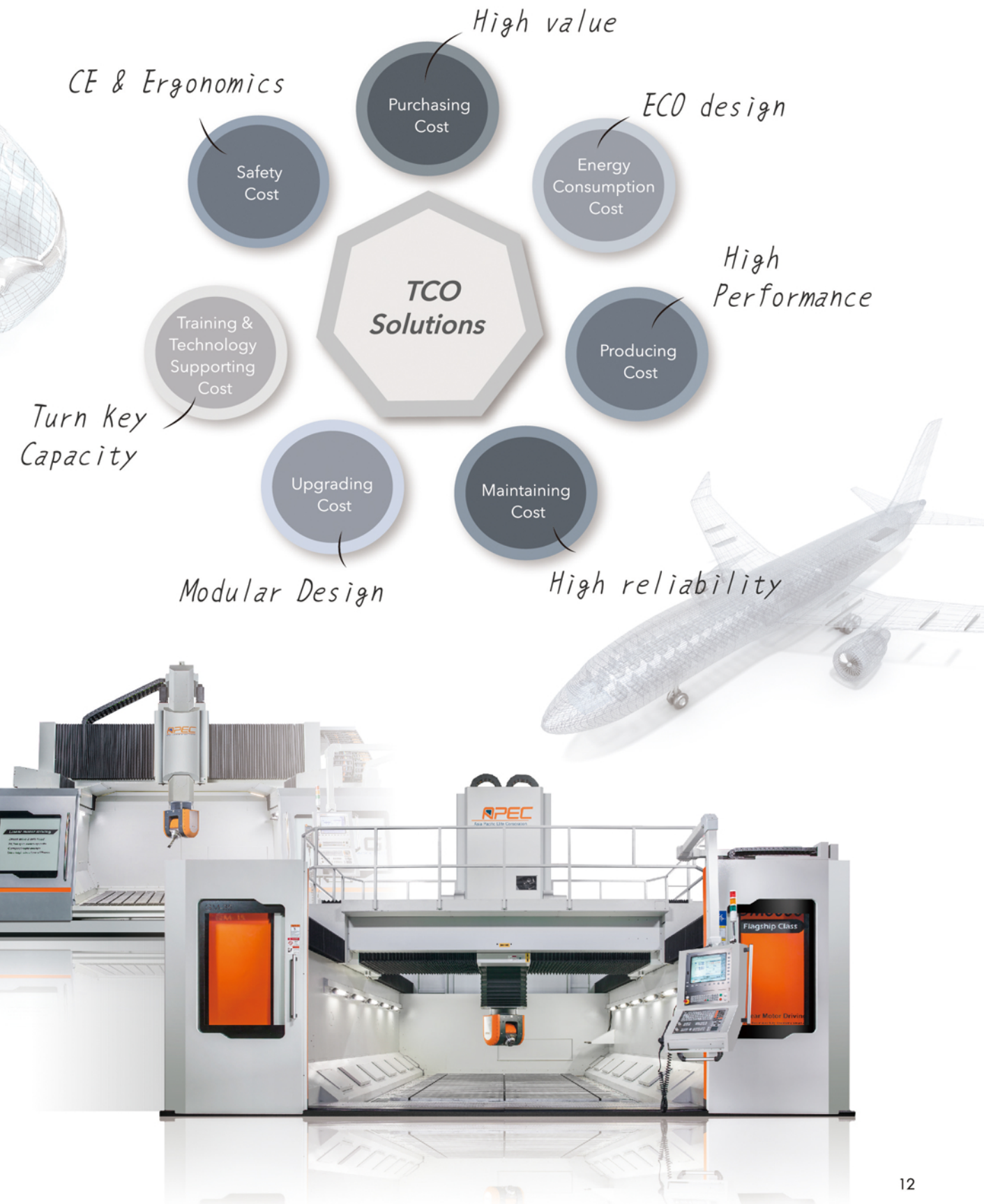


# TCO Solutions

www.apecnc.com

Based on Tongtai Group's Brand Philosophy "Trust and Technology"

APEC especially pay attention on custom's whole product life cost and efficiency. We devoted to offer best total cost of ownership to our customer.



# Intelligent Manufacturing System

Considering productivity improvement, better machining precision, operating facilitation, as well as protection and maintenance assistance, TIMS includes four management functions: production management, intelligent monitoring, tool management, and workpiece management. These provide customers a comprehensive intelligence manufacturing system and a friendly human-machine interface.

## Production management



Cutting load Monitoring  
APC information  
Machine Alarm Messages Record  
Troubleshooting and  
Maintenance Support



## Intelligent monitoring



Motor Load Monitoring  
Machining Adaptive Control  
Crash Protection



## Tool management



Tool Usage Time Tracking  
Tool Compensation  
Tool Life Management  
Tool Overload Protection



## Workpiece management



Workpiece positioning



# Turn Key Capacity

Shorten the Time to Volume & Money

## Job Study

- Drawing
- Material, dimension, tolerance analysis

## Time & Cost Study

- Current machine analysis.
- Future's machine planning.
- Customer-made machine planning
- Tool, Jig & Tooling planning

## Full Prepared

- Machine Manufacturing
- Pre-machine Training & Education
- Preparation for start-up:  
Tool & attachment Jig & Tooling design & build up, CAD/CAM & post processor, NC Programing & processing, Simulation & Verification

## Starup & Volume up

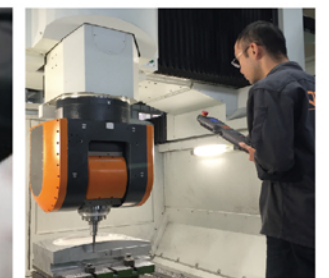
- Training & Education after machine Installation:  
Practical case Machining & controller operation  
Maintenance & Trouble shooting
- Production management assistance

Time to  
Volume

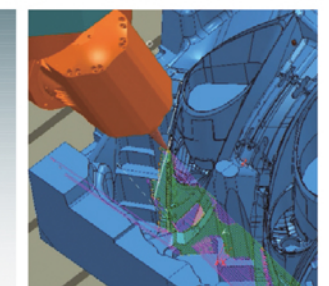
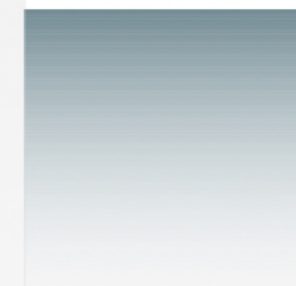
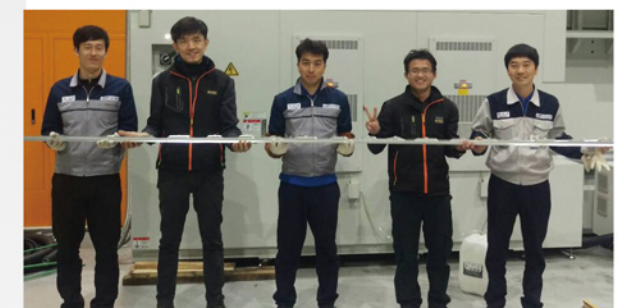
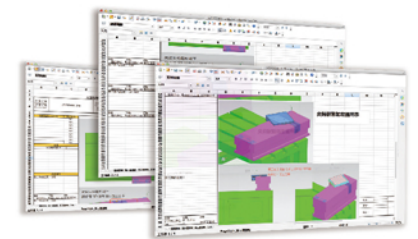
Trust



Time to  
Money



Technology



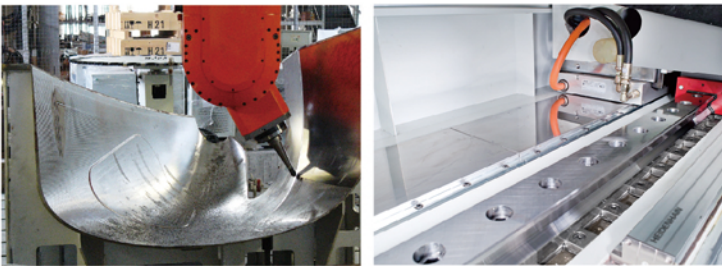
# Aerospace Manufacturing

## Aluminum Structure



- High MRR ( Material Removal Rate )
- High Power spindle up to 100HP/30000rpm
- High dynamic axis acceleration up to 7m2/sec for GM series.
- High chip exhausting system
- Module 2-axis head with various spindles available
- Flexible manufacturing with duo system, eq. dual spindle, dual working zone, dual table...etc.

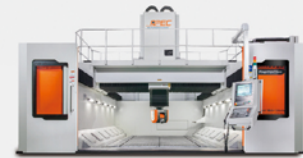
## Lay-up tooling



- For both INVAR and aluminum tooling material corresponding
- Excellent surface quality thanks for linear motor driving system and mechatronic commissioning
- 30m ultra long travel available



### Suitable models



GM Series



G Series



MT Series

### Suitable models

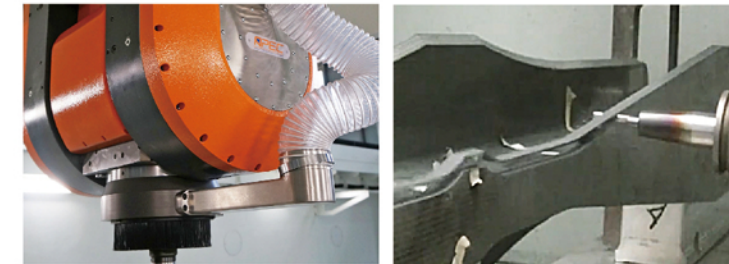


G Series



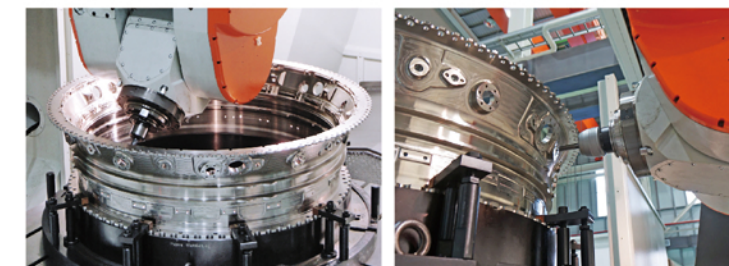
MT Series

## Composite structure



- Dust suction hood on spindle
- Working zone Dust collecting & filtering system
- Dust pollution prevention design for both mechanical and electrical system
- Complete enclosure with top roof sliding cover
- Flexible manufacturing with dual working zone, dual table, APC...etc.

## Turbine casing of Aero engine



- Specialized design for turbine casing with different shapes and types
- Very good machine structure rigidity, full axes with box way available.
- Both for Internal and outside machining without extra attachment
- Up to 1000Nm spindle capacity for internal and outside machining
- Mill-turn function optional

## Titanium Structure



- Machine with very high rigidity
- 1000Nm 5-axis continuous machining capacity
- Roughing with both vertical and horizontal axes
- High pressure and high volume machining coolant

### Suitable models

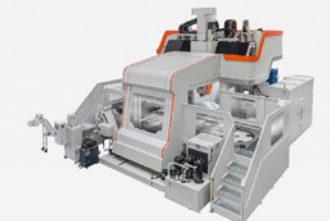


G Series

### Suitable models



MDU Series



MDU2000W Series

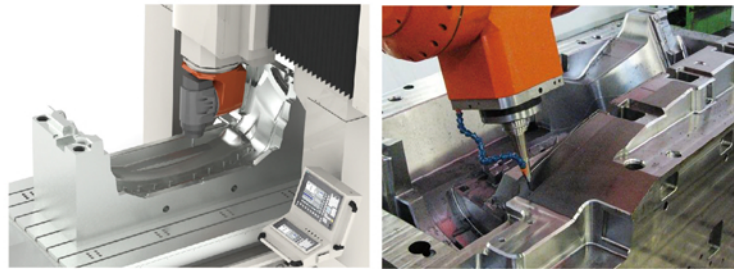
### Suitable models



MDU2000W Series

# Automotive Die & Mold Manufacturing

## Injection mold of interior / exterior parts and head lights

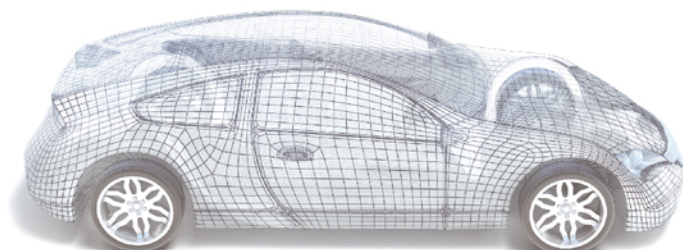


- Excellent surface quality on Bumper mold, instrument panel, and lamp mold.
- Mono support 2-axis head fit for complicated mold that can eliminate lots of EDM time.
- 24000rpm high speed spindle support tiny tool (even smaller than R0.5) multi-pencil corner cleaning.
- High dynamic feature can save up to 50% machining time compare to conventional machine.

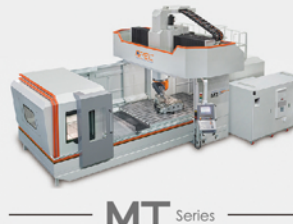
## Rapid prototyping



- Large axes travel and working zone up to 4000x8000x2000 for complete car machining.
- Very good surface quality without vibration mark on it thanks to good rigidity machine structure.
- Dust suction hood on spindle could be optional.
- Complete enclosure with top roof sliding cover



### Suitable models



### Suitable models



## Checking gauge



- Very good volume accuracy can make well precise checking gauge.
- On-line workpiece measurement system optional

## Stamping Die



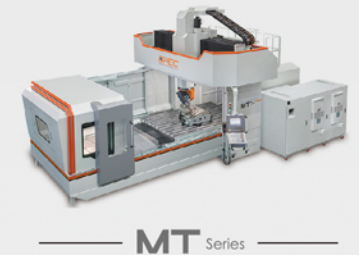
- Cutting feed-rate over 12m/min thanks for linear motor driving technology.
- GM Box in Box structure offer excellent and reliable geometric accuracy. And offers very good heat deformation stability.
- GM series can save your machining time and labor polishing time substantially.
- HSK100A with 15000rpm fit for roughing and finishing requirement.

## Tire mold



- Strong spindle capacity offers high torque and high speed.
- Roughing and finishing could be done at one machine

### Suitable models



### Suitable models



### Suitable models

