



東台集團
TONGTAI GROUP



Automotive Industry Solutions



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In comparison to other industries, auto parts require higher precision, longer durability, and have difficult shapes. Tongtai has the numerous experiences in the automotive industry, and now available products include special purpose machines, vertical/horizontal CNC lathes, vertical/horizontal machining centers, etc. No matter is it manufacturing of one particular part or creating a production line – Tongtai and other Group members have a deep experience. Tongtai is well-known with lathes and machining centers and Asia Pacific Elite Corp. (APEC) has got the reputation with die & mold machining centers. In 2015, two partners, PCI-SCEMM(France) and ANGER Machining GmbH(Austria), joined Tongtai Group. With their experienced solutions and high-end machining technologies, it expands the auto parts applications, such as cylinder block, cylinder head and transmission related parts. Tongtai Group also benefited from the direct relationship with OEMs, tier 1 and tier 2 suppliers in Europe and America. The competitive strengths of Tongtai Group was enhanced again in the automotive industry.

In this catalogue, we classified a car into several systems for your easy understanding. Also, we would like share some of our experiences with you. You are invited to learn more about Tongtai and Group member's high-performance machines and ability of machining line planning.



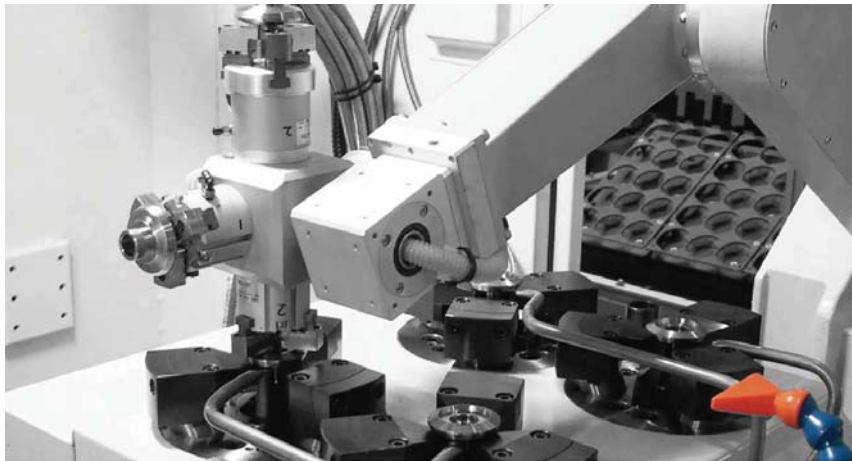
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Most cost-efficient automation solutions

Driven by the rapid development of automation technology in recent years, the automation systems have been introduced to the enterprises, not only to enhance the competitiveness and reduce the labor costs but also to improve the productivity and yield. The benefits and technology brought by automated production has become one of the cornerstones to create customer values and enhance industrial competitiveness.

Tongtai manufactured the first automation line 35 years ago, working with the special purpose machine to produce the engine valve of the motorcycles. Until now, Tongtai has already manufactured more than 300 sets of various automation systems. You will be satisfied with the automation solutions from Tongtai as the reliability has been approved by the auto parts makers around the world.



Benefits:

- Increase productivity.
- Enhance machining quality and yield rate.
- Decrease labor costs.
- Speed up return on investment.
- Improve floor space turnover.
- Prevent operation mistakes.
- Enhance production flexibility.
- Lower workplace hazards & labor limitation.



Automation systems

Single Machine Machine Q'ty : 1



Most efficient robot configuration is designed according to the machine structure, such as the universal joint type robot, the special purpose robot for the specific machines, or the customized loading/unloading system.

Multiple Machines Machine Q'ty : 2~10

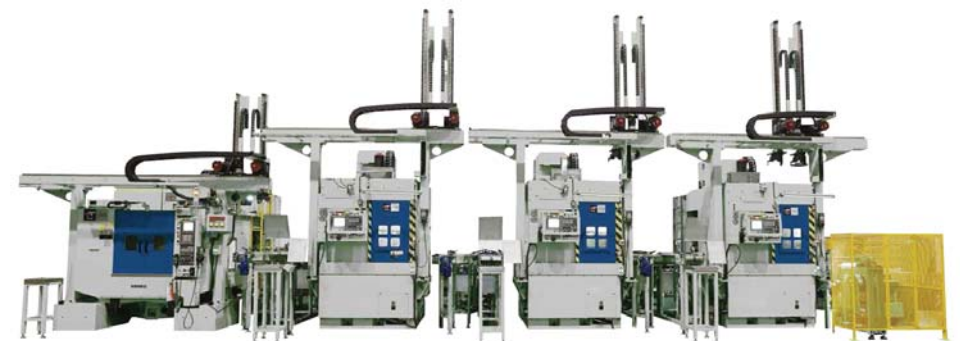


Most efficient connection between the machines establishes the automation system suitable for production line; no matter similar machine type (e.g. CNC lathe + CNC lathe) or different machine type (e.g. CNC lathe + machining center).

Flexible Manufacturing System (FMS)

Machine Q'ty : 1~2 or more

Flexible manufacturing system (FMS) is a complete production management system of the materials and information, including the material storage and scheduling, machining/manufacturing, inspection, stock and production management. FMS satisfies the targets of the low-volume high-variety production because of its rapid adjustment capability to the production demand changes.



Automation systems

PCI automation solutions



PCI has realized a lot in the field of automation solutions. In accordance with machining demands, it has gantry loaders and robotic systems for clients to choose. Besides, it can integrate other processes, such as deburring, washing, assembly, leak testing and 3D measurement as a complete solution.



ANGER automation solutions



Basing on customers demands, ANGER provides clients 1 to 1 or 1 to 2 automation systems including the integration of tooling, PLC/CNC programmings.

Automation solutions for machines



Tongtai - Expert of customization & turnkey projects

Tongtai started the business as the manufacturer of the special purpose machines. The capabilities of the customized design and the complete turnkey lines are our core values. According to the machining requirements of the customer's workpieces, the process analysis, complete line layout, tool and fixture design, and machining application are all carried out and fully tested at Tongtai. The customers can start the production directly after installation.

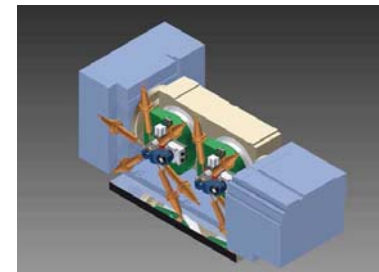
Utilizing more than 40-year experiences and technology in customization and turnkey projects, from parts & materials, production, inspection, to stock and production management, Tongtai will provide you the most cost-efficient turnkey solutions.



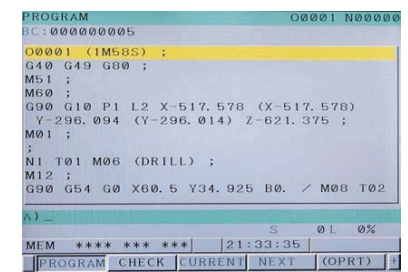
Engineering Analysis



Cutting Test



Tooling Design



Programming



Jig & Fixture Design



Production Line Layout

Six automotive's systems

PCI
PROCESS CONCEPTION INGENIERIE

ANGER
HIGH PERFORMANCE MACHINING

APEC
ASIA PACIFIC ELITE CORP



Tongtai

Engine system

Tongtai PCI-SCEMM



Cylinder block



The machining characteristic of aluminum is high speed and high precision. Tongtai's HB series as well as PCI's Meteor series are able to satisfy client's needs. For more flexible applications, these machines are usually available with 4th/5th axis.

Horizontal machining center - HB series

- BT-50 or HSK-A100 spindle
- Automatic pallet changer system design
- Column with double walls design
- Wide door for easy loading and unloading



HB-500II



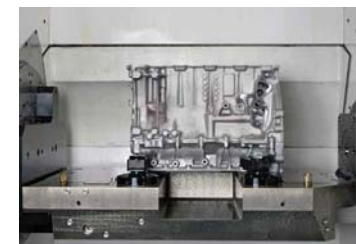
Cylinder face machining (HB series)

Horizontal machining center - Meteor series

- A axis or B on A axis design for easy loading/unloading and chip flow
- High dynamic response for high speed and high accuracy cutting
- Available with various automation solutions



Meteor GL



A axis or A+B axis rotary table for various machining demands.



Cylinder face machining (Meteor series)

Engine System

Cylinder head



Vertical machining center - TMV series

- High speed machining with excellent stability
- Customization is available for satisfying customer's needs
- Available with automation solutions

TMV series is an economic solution for machining datum face and pin holes and has various spindles available for machining different materials in order to match customers' demands. Besides, this series possess a high rigidity structure and highspeed machining, and can be sufficiently used for making different kinds of parts, and also can complete automatic programs.



TMV-1050QII

Horizontal machining center - SH series

- BT-40 or HSK-A63 spindle
- Designed for aluminum alloy machining
- Single table and dual-pallet changer both available
- Suitable for arranging into machining line thanks to its compact design

Considering the size and deep drilling requirements, as well as taking into account tool's length and weight, the spacious working area of SH series is able to satisfy this kind of machining requirements. In addition, the machine cover is improved for saving floor space and facilitating production line arrangement.



SH-5000P

Horizontal machining center - HB series

- BT-50 or HSK-A100 spindle
- Automatic pallet changer system design
- Column with double walls design
- Wide door for easy loading and unloading

The features of this series are similar to SH series. However, it is designed with BT-50 or HSK-A100 spindle for meeting client's needs.



HB-500II

Horizontal machining center - Meteor series

- A axis or B on A axis design for easy loading/unloading and chip flow
- High dynamic response for high speed and high accuracy cutting
- Available with palletized for higher flexibility

The tool exchange time is 3.4 seconds (C to C), which effectively helps to save non-machining time and increase processing efficiency.



Meteor GL Palletized

Fine line boring for camshaft bearing bores



A+B axis for higher machining flexibility



Engine system

Camshaft cover



Modular transfer center - FLXBL

- Double automatic tool changers for twofold machining with high flexibility
- Double crown turret heads available
- Quick change multi-spindle heads for changeover or retooling
- Different ways of loading/unloading
- Available with automation solutions

All operations are finished in one clamping including camshaft boring. Thanks to the compact design allowed twin-spindles with ATC, twin-turret heads, milling heads, multi-spindle angle heads and rapid movements from spindles to spindles, the cycle time is optimized without compromise to the machining quality.



FLXBL



Wide inner space in the machine rotating the workpiece to different angles. Fixed spindle heads and special multi-spindle angle heads are used for machining to guarantee excellent working accuracy.



Bearing seat



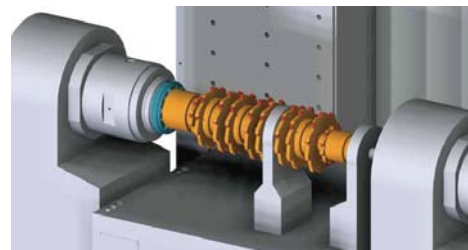
Customized turnkey solutions - HCX

- Customized specifications
- Quick change multi-spindle heads for changeover or retooling
- Available with automation solutions



HCX

Multi-spindle head design, completed with all kinds of suitable tools can considerably lower the machining time, this makes the machine very productive. It's possible to process both sides of jackshaft bearing, so it can effectively replace traditional special machines.



Gang-mills with any number of tools:
High degree of productivity and precision thanks to a stable tool design with counter-bearing of the spindle.



Crankshaft bearings and cheeks can be machined with gang milling tool.

Engine system

Bearing housing



Horizontal CNC lathe - TC / TCS series

- Strengthened rigidity
- User-friendly design and excellent operability
- Servo turret or power turret is available

Analyzing by Finite Element Analysis(FEA) for ensuring the rigidity of structure. Compared with the last generation, the rigidity of TC/TCS series has improved by 50%. Standard equipped with servo turret for high machining efficiency. Furthermore, power turret and automation solutions are available.



TCS-2500L

Horizontal CNC lathe - TNL series

- High rigidity machine design
- Linear guide way makes higher efficiency
- Servo turret or power turret is available

High rigid structure design ensures the stability and accuracy during the inner/outer diameter machining. Through the applications of automation solutions, it benefits on reducing labor costs and increasing productivity.



TNL-120TL

Vertical machining center - QVM-610All

- Automatic pallet changer to increase productivity
- Patented tri-point clamping and supporting device to enhance stability of working table
- Automation solutions are available

For ensuring long-term machining precision, QVM-610All adopts high rigidity structure and rotatory table clamping system design. In addition, by the separation of the table, it divides into machining area and non-machining area. The operator is able to process load/unload task during machining, which increasing productivity and decreasing non-machining time and staff's duties.



QVM-610All

Vertical machining center - TMV series

- High speed machining and machining stability
- Customized solutions available
- Available with automation solutions

TMV series is able to work with various automation solutions. In addition, the features of high rigidity structure and high speed machining in this machine model are allowed to process high efficiency machining.



TMV-850QII



Engine system

Camshaft



Horizontal machining center - HA series

- Automatic pallet changer design
- High torque spindle design
- Column with double-wall design

It's suitable for machining the left and right holes of the camshaft. The automatic pallet changer system saves the loading/unloading time. In addition, rotary table with patented clamping & supporting devices and full-circle hydraulic braking system will keep the machining precision during the long term heavy duty machining.



HA-400II

Horizontal CNC lathe - TNL series

- High rigidity design
- Steady rest is available for improving machining quality
- Servo turret or power turret is available

Work with steady rest is able to improve workpiece precision during machining. In addition, for reducing the labor costs and increasing the productivity, automation solutions are available with the customer's choices.



TNL-130AL

Horizontal CNC lathe - TC/TCS series

- Rigidity Strengthened
- User-friendly design to operators
- Servo turret or power turret is available

Using Finite Element Analysis(FEA) to ensure the rigidity of machine structure. Comparing to the last generation, the rigidity of TC/TCS series is improved by 50%. Standard machine is equipped with servo turret for high machining efficiency. Furthermore, power turret and automation solutions are available.



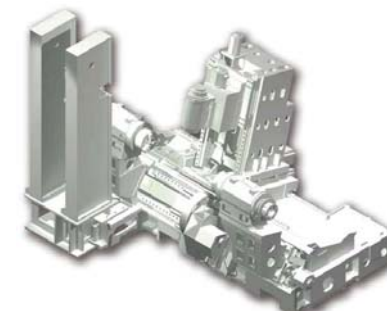
TCS-2500L



Multi-tasking turning center - TMS series

- One time clamping to finish all machining.
- Orthogonal Y-axis design
- Sub-spindle is available
- Lower turret is available

TMS series integrates turning and milling functions to be very flexible for applications. Three axis are perpendicular to each other to ensure the machining precision. The sub-spindle and lower turret are available to satisfy various machining requirements.



TMS-2000ST

Engine system

Gear pump



Vertical machining center - VTX series

- High productivity
- High operating efficiency with compact size
- High rigid tapping precision

It's a BT-30 small type machining center. The spindle torque can achieve 82 Nm in medium and low speed. With the design of high rigidity machine structure and powerful spindle, VTX series is suitable for various machining tasks, such as big diameter drilling, tapping, and milling. Moreover, the servo driven swivel type tool changing system provides high speed tool changing, and shortens the non-cutting time.



VTX-5



TCS-2000

Horizontal CNC lathe - TC / TCS series

- Overall rigidity is improved
- User-friendly design to operators
- Servo turret or power turret is available

Horizontal CNC lathe - TNL series

- Overall rigidity is improved
- Servo turret or power turret is available

High rigid structure design ensures the stability and accuracy during the inner diameter machining.



TNL-100T

Brake system



Brake system

Brake disc



Vertical machining center - TMV series

- High speed machining capability and high machining stability
- Customized solutions are available
- Automation solutions are available

Most of brake disc machining lines work with automation solutions. Suitable distance from spindle and table facilitates the loading/unloading by gantry type robotic arm.



TMV-850QII

Vertical CNC lathe - TVL series

- High torque spindle design
- Composite tools are available for machining
- Servo double tool device is available for increasing machining efficiency

TVL series can use composite tools to increase processing efficiency. Furthermore, depending on different machining requirements, the servo double tool device is also available. It 's allowed to process different machining operations or perform assisted machining at the same time.



TVL-45RF



Bracket



Vertical machining center - TMV series

- Rigidity Strengthened
- Various spindles are available
- Efficient chips disposal
- Automation solutions are available

TMV series is able to satisfy the machining requirements of drilling, tapping, and circular milling. Furthermore, it can work with various automotive solutions for reducing labor costs and increasing production efficiency.



TMV-720A

Special purpose machine -1W-1S/2W-2S NC ML SPM

With unique design for milling calipers, 1W-1S / 2W-2S ML SPM is ones of Tongtai's most representative and experienced special purpose machines. As a result of quick tool/fixture changing design and NC control, it's also flexible for low-volume high-variety productions.



2W-2S

Brake system

Caliper



Vertical machining center - TMV series

- High speed machining capability and high machining stability
- Customized solutions are available
- Available work with automation solutions

TMV series is one of Tongtai's most popular models because of its various spindles for machining different materials and high ratio of cost-performance for the best investment.



TMV-720A



Horizontal machining center - SH series

- BT-40 or HSK-A63 spindle
- Designed for aluminum alloy machining
- Single table and dual-pallet changer both available
- Suitable for arranging into machining line thanks to its compact design



SH-4000P

Big radius milling and cylinder fine boring are possible to be achieved on HSH series. Both the patented table clamping system and full-circle hydraulic braking system keep the machining precision during heavy duty machining.

Horizontal CNC lathe - TNL series

- High rigidity design
- Roller guide way design
- Servo turret or power turret is available

▼ An alternative for cylinder boring on CNC lathes



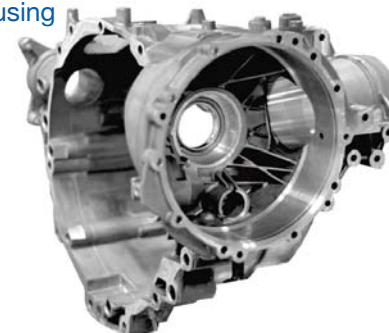
TNL-130TL

It's an alternative for cylinder boring on CNC lathes. By using the composite tools, it saves machining and tool changing time in order to reach the goal of high machining efficiency.

Transmission system



Transmission housing



Horizontal machining center – Meteor series

- A axis or B on A axis design for easy loading/unloading and chip flow
- High dynamic response for high speed and high accuracy cutting
- Available with various automation solutions

Utilizing the features of rotary table, one time set up is able to complete multi-faces machining.



Meteor GL

Various automation solutions are provided based on customer's needs.



Transmission system

Anger Tongtai

Valve plate · valve body



Customized turnkey solutions - HCX

- Customized specifications
- Quick change multi-spindle heads for changeover or retooling
- Available with automation solutions



HCX



Comparing to traditional machining centers, HCX has the higher machining accuracy, multi-spindle design, one setup to carry out all the compact size. The robotic arm can work together to control the work feed.



Rear axle



Specific general-purposes machines

Three-axis moving column design brings the max. working area in the limited space. Furthermore, to work with special purpose machine, it is able to process the axle machining, including both ends, inner diameter, chamfering, drilling, and tapping.



- Special fix & fixture design allows the adjustment with different axle length



Transmission System

Differential



Vertical machining center - TMV series

- High speed machining capability and high machining stability
- Customized solutions are available
- Automation solutions are available

With the features of high speed machining and excellent chips disposal design, TMV series is the most popular models among Tongtai's vertical machining centers. According to the machining requirements of the workpiece, different models are recommended to meet your needs. TMV series is also suitable to work with various automation solutions. The 4th or 5th axis is available to carry out multi-angle machining.



TMV-720A

Horizontal CNC lathe - TC / TCS series

- Rigidity strengthened
- User-friendly design to operators
- Servo turret or power turret is available

Analyzing by Finite Element Analysis (FEA) for ensuring the rigidity of structure. Compared with the last generation, the rigidity of TC/TCS series has improved by 50%. Standard equipped with servo turret for high machining efficiency. Furthermore, power turret and automation solutions are available.



TCS-2500L

Horizontal CNC lathe - TNL series

- High rigidity machine design
- Linear guideway design for better efficiency
- Servo turret or power turret is available

Horizontal lathe is usually used in processing differential's inner diameter and end-face machining. According to the workpiece size, customer can choose suitable machine models. High rigidity machine structure design ensures excellent machining precision during long-term operation. Power turret and various automation solutions are available for reducing the labor costs and increasing the productivity.



TNL-100T

Horizontal CNC lathe - TVL series

- High torque spindle design
- Power turret is available for more applications

TVL series standard model is equipped with hydraulic turret. Depending on machining requirements and customer needs, power turret, roller guide way, as well as box-way design are also available.



TVL-40

Wheels



Vertical machining center - TMV series

- Rapid and high efficient machining
- Effective chip removal thanks to 4 chip augers
- Spacious working area facilitates workpiece to process 180 degrees rotation.
- Applicable rim dimensions: 20"/22"/24"/26"



TMV-1050W

Direct-driven spindle with 15 kW motor can satisfy the machining requirements of wheels processing. Four chip augers and huge slanted plate provide effective chip removal capability. Furthermore, spacious working area is big enough to equip every fix & fixtures or 4th axis tables.



Vertical CNC lathe - TVW series

- Large size box-way design
- Efficient chip removal

Wide box ways give TVW series the best rigidity for heavy duty cutting. Vertical saddles and slant beds protect the working area from chip accumulation, it's a unique design to satisfy wheel machining even with automation solutions.



TVW-26DT

Wheels

Tongtai

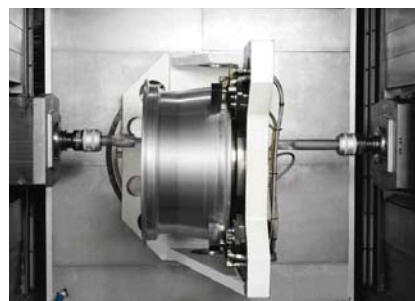
Horizontal machining center - MA series

- Especially suitable for PCD hole and air valve hole
- Two spindles design
- High-efficiency chip removing
- Spacious working area

Spacious working area facilitates workpiece to process 180 degrees rotation. Easy chip flow benefits from the rotating table.



MA-200



Two spindles and rotation mechanism design ensures multi-angle machining.

Horizontal CNC lathe - HS series

- High rigidity heavy duty cutting
- Especially for mirror turning

45 degree slanted machine bed design ensures the rigid structure and facilitates chips disposal. Especially suitable for the mirror turning which is emphasizing on machining precision and grains. In addition, Ø160mm build-in type spindle is available for avoiding vibrations transmitted to spindle caused by belt-driven mechanism.



HS-40W



Automation line with robotic system

Large multi-axis robot is suitable for the automation among the various medium to large machines; for example, the connection between the vertical/horizontal CNC lathes and the vertical/horizontal machining centers. Tongtai can design a complete logistics and information management system according to the customer's requirements. The logistics includes the supply system, machining facilities, inspection station, cleaning station, etc. The information flow includes the production operation management (such as the workpiece, jig/fixture, tools, programing, etc.), production information management and production schedule management.



- 1 OP-10 TVW-22DT
- 2 OP-20 TVW-22DT
- 3 OP-30 TMV-1050W
- 4 Robot Controller
- 5 Multi-Joints Robot
- 6 Material Conveyor
- 7 Finishing Workpiece Conveyor
- 8 Workpiece Turnover Station
- 9 Clean Station

Suspension system



Tongtai

Knuckle



Horizontal machining center - MA series

- Specific general purpose machine designed for knuckle machining
- A 5-axis trunnion table adopted for intensive engineering

MA series is equipped with a 5-axis trunnion table extremely suitable for knuckle machining with various angles. This feature allows to assort cycle times between operations or finish machining jobs as many as possible.



MA-400F



Horizontal machining center - HB series

- BT-50 or HSK-A100 spindle
- Automatic pallet changer design
- Column with double walls design
- Wide door for easy loading and unloading

HB series features a BT-50 or HSK-A100 spindle and a rigid structure for machining cast iron. The automatic pallet changer brings more flexible applications as well as time saving.



HB-500II

Suspension system

Vertical machining center - TMV series

- High speed machining and machining stability
- Customized solutions are available
- Available with automation solutions

It's able to process knuckle's datum face and pin holes. Various spindles are provided to satisfy different machining requirements. TMV series is able to work with various automation solutions. In addition, the features of high rigidity structure and high speed machining in this machine model are allowed to process high efficiency machining.



TMV-920A



Vertical CNC lathe - TVL series

- High torque spindle design
- Power turret is available for more applications

TVL series is equipped with hydraulic turret. Depending on machining requirements and customer needs, power turret, roller guide way, as well as box-way design are also available.



TVL-40H

Die & mold

Tongtai



Die & mold

Injection mold



High speed 5 axis gantry machining center -G / MT series

- Linear motor drive on G series
- 5-axis high Dynamic
- High rigidity by U frame structure (G-3020)
- Z-axis double screw

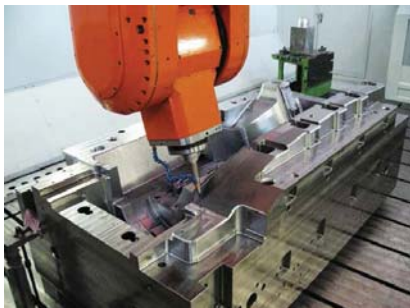


G-2540 / G-3020

- 1.Excellent surface quality on Bumper mold, instrument panel, and lamp mold.
- 2.Mono support 2-axis head fit for complicated mold that can eliminate lots of EDM time. 24,000 rpm high speed spindle support tiny tool (even smaller than R0.5) multi-pencil corner cleaning.
- 3.High dynamic feature can save up to 50% machining time compare to conventional machine.
- 4.Strong spindle capacity offers high torque and high speed.
- 5.Roughing and finishing could be done at one machine



MT-2432



Stamping die



High speed 5 axis gantry machining center - GM / G series

- Box in Box full symmetric design
- Dual linear motor driving on X/Y/Z axis (GM)
- 5-axis high Dynamic
- Excellent geometric accuracy and surface quality



GM-3250

- 1.Cutting feed-rate over 12 m/min thanks for linear motor driving technology.
- 2.GM Box in Box structure offers excellent and reliable geometric accuracy. It also offers very good heat deformation stability.
- 3.GM series can save your machining time and labor polishing time substantially.
- 4.HSK100A with 15,000 rpm fit for roughing and finishing requirement.

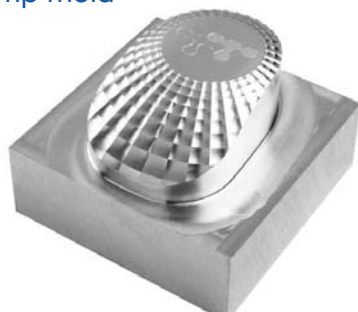


GM-3050



Die & mold

Car lamp mold



Vertical machining center - MDV series

- Both high-speed machining and high machining performance
- High rigidity double-column structure design
- Build-in type spindle design

For having excellent machining performance, MDV series uses finite Element Analysis (FEA) to improve structure rigidity as well as adopts excellent double-column structure and thermal compensation technology.



MDV-812

Vertical machining center - VC series

- Wide span column and best force flow route design
- Variety of spindles are available
- Build-in type 20,000 rpm spindle expanding the ranges of machine applications.

VC series is equipped with a direct-drive spindle for ensuring the motor power is able to completely transmit to the spindle. It also adopts roller linear guide ways for assuring the surface quality of mold. The spacious working area design facilitates the loading/unloading by overhead crane.

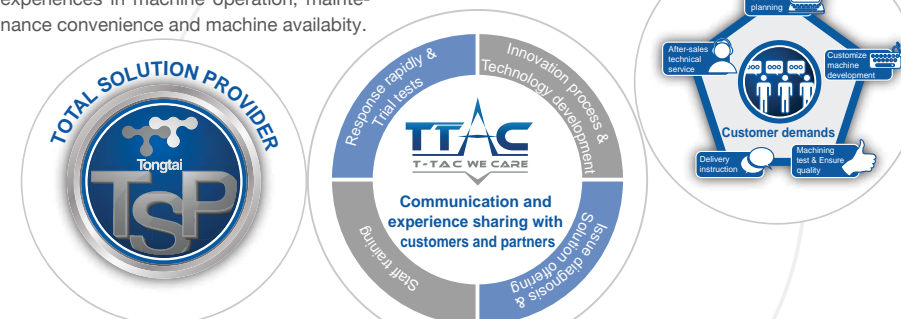


VC-608

Tongtai

Tongtai- Technical Application Center

The purpose of T-TAC is to take care of customer's machining solution actively. Based on the outstanding technical applications, Tongtai is able and willing to provide advanced machining technologies, machining solutions as well as trial tests to its customers and ensures them excellent experiences in machine operation, maintenance convenience and machine availability.



T-TAC technical and machining solutions

Solutions	Contents
Product manufacture test	Through the manufacturing progress and jig & fixture plans, Tongtai's skilled staff will manufacture the first piece for understanding the client's corresponding demands.
Machining technologies	By introducing innovative technologies and adding the extra functions, T-TAC is available to provide the brand-new solutions.
Machine technology	Our technical staff will test current problems, which clients have, in the same machine model for processing problem diagnosis and providing possible solutions. Furthermore, our skilled staff is able to provide the services at the client's factory.
Training	T-TAC is open to train current clients, potential customers, agents, teachers/students, and employees and to strengthen their abilities.
Technology exhibits	T-TAC is also an excellent platform to launch new products/technologies by cooperation with software/hardware suppliers. With presentation of highly reliable products/technologies, it's possible to provide higher efficiency and availability solutions than existing ones.

Global distributors. Closer to customers in order to provide immediate service.

T-TAC global distributors are currently locating not only in Taiwan, but also in Malaysia, mainland China (factory in Suzhou), Switzerland. In the future, T-TAC will be established in others countries in order to serve local clients and in order to let them experience excellent quality of Tongtai machines.

