

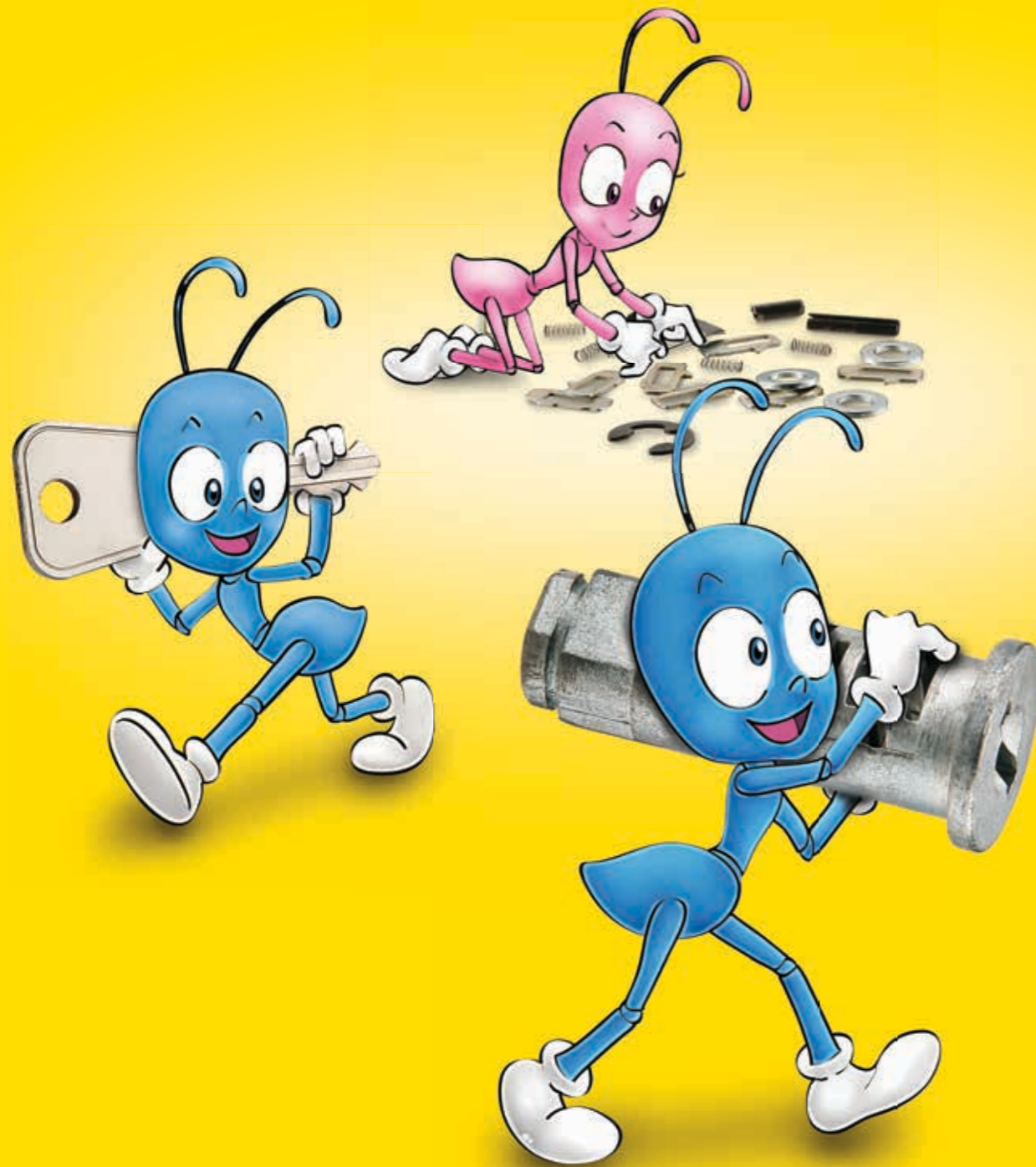


vernal

MANUFACTURING & ENGINEERING CO.,LTD.



Discovering The Beneficial Supplier



TO PERFORM A PROJECT TOGETHER BY THE PROFESSIONAL DIVISION OF LABOUR TIGHTLY

Just like the ant's world, the small and medium manufacturers with unique professional technology in their own fields are all very flourishing in Taiwan. In addition to the technical specialty in VERNAL, we also combine with these subcontracting partners as an integrated supply chain to perform customized projects for our clients.



FOUNDED IN 1984

For these 30 years, we always focus on manufacturing customized components and assembly products.

Initially we made customers' products according to their original drawings completely which have been produced by themselves for years, and then progressively we transform into acting as engineering assistance supporter for new design.

For the attainment of advance assistance, VERNAL provides a winning solution by the following capabilities throughout the steady mass production :

- Prototype making
- Manufacturing method and mechanism improving proposals.
- Design and creating of tooling, re-process machining jigs, tools and professional single function machines.

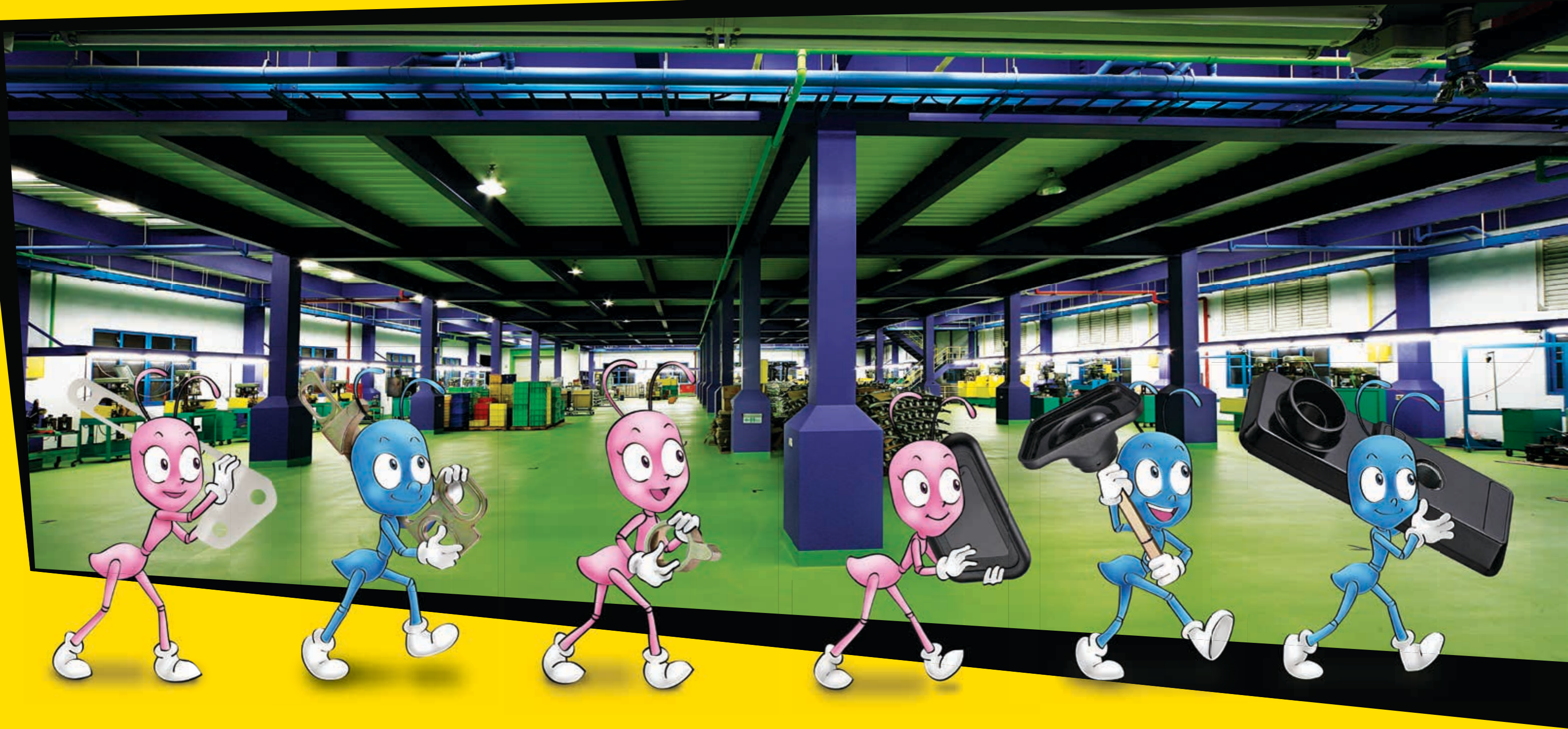


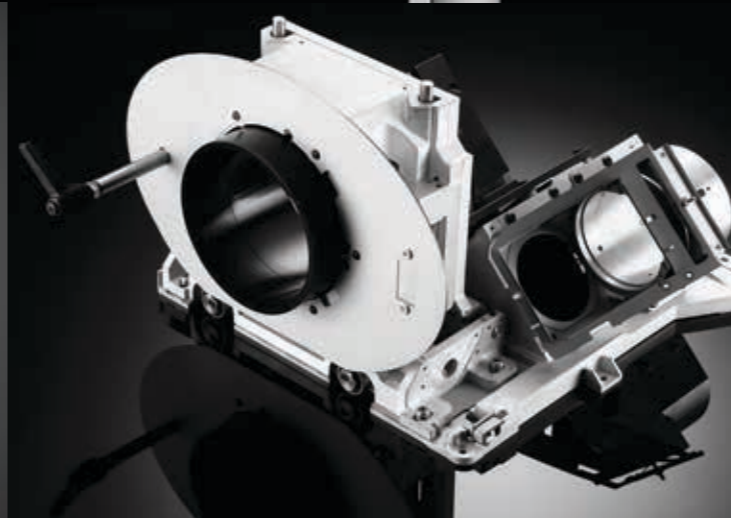
CUSTOMIZED PRODUCTS

Currently, we offer over ten different kinds of industrial customized assembly products.

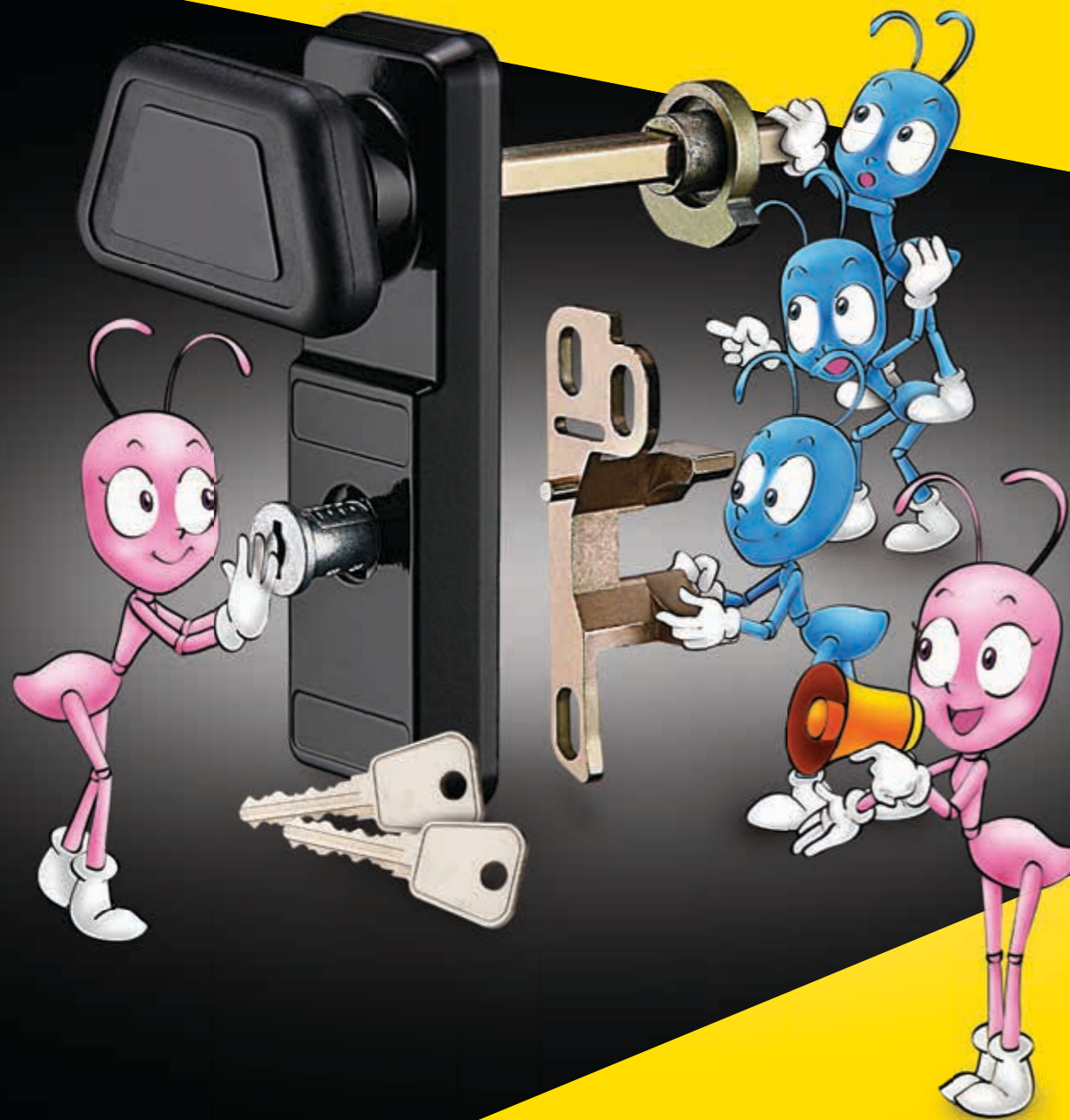
The relevant industries including :

- Electronic
- Machinery
- Yacht
- High Quality OA Furniture
- Filters
- Buildings
- Professional Hand Tools
- Petrochemical Facilities
- Vehicle
- Diving Appliance
- Electric Instrument
- High Pressure Water Spraying System
- Conveyer





VERNAL can always be relied on for engineering a winning solution, no matter how complex your project is !



OUR MANUFACTURING FIELDS

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ENGINEERING ASSISTANCE

VERNAL NOT ONLY FIND A WAY TO MAKE YOUR PROJECT BETTER, VERNAL FIND A BETTER WAY TO MAKE YOUR PROJECT .

In addition to supplying semi & completed assembly products to meet customers' drawing requirements and specifications, we also provides engineering assistance for customers' new design through our engineering team and long term cooperated subcontracting partners.

By the essential engineering assistance, we'll convert customers' perfect design into real and valuable products in the shortest time.



- Clean Room Grade 10,000
- Temperature Control $20^{\circ}\text{C} \pm 0.5$
- Humidity Control $55\% \pm 5$

A SINGLE SOURCE FOR DIE CASTING THROUGH MACHINING & ASSEMBLY

As the saying goes that "Casting is the foundation of industry". VERNAL's engineering team possess very complete casting experience that from the basic Sand Casting and expanding to investment Casting, Gravity Casting, and High Pressure Die Casting.

Therefore, VERNAL's engineering team provides mature casting technology that can satisfy our customers' requirements on casting quality with its complex design.

HIGH PRESSURE DIE CASTING

Single Source For Die Casting Through Machining & Assembly, Pressure Die Casting, Machining, Finishing, Assembly & Testing

It is basic requirements to select a die casting supplier-with professional tooling design and building, superior die casting technique capabilities.

VERNAL excels in putting superior technology together with engineering specialists to design and fabricate

special machine for secondary operations additionally.

We help our customer to increase profitability with combining several labors consistently intensive operations into a single automated process.



Capabilities include

Die Casting

- Die casting machines are ranged in size from 30 to 800 ton capacity.

Secondary Operations

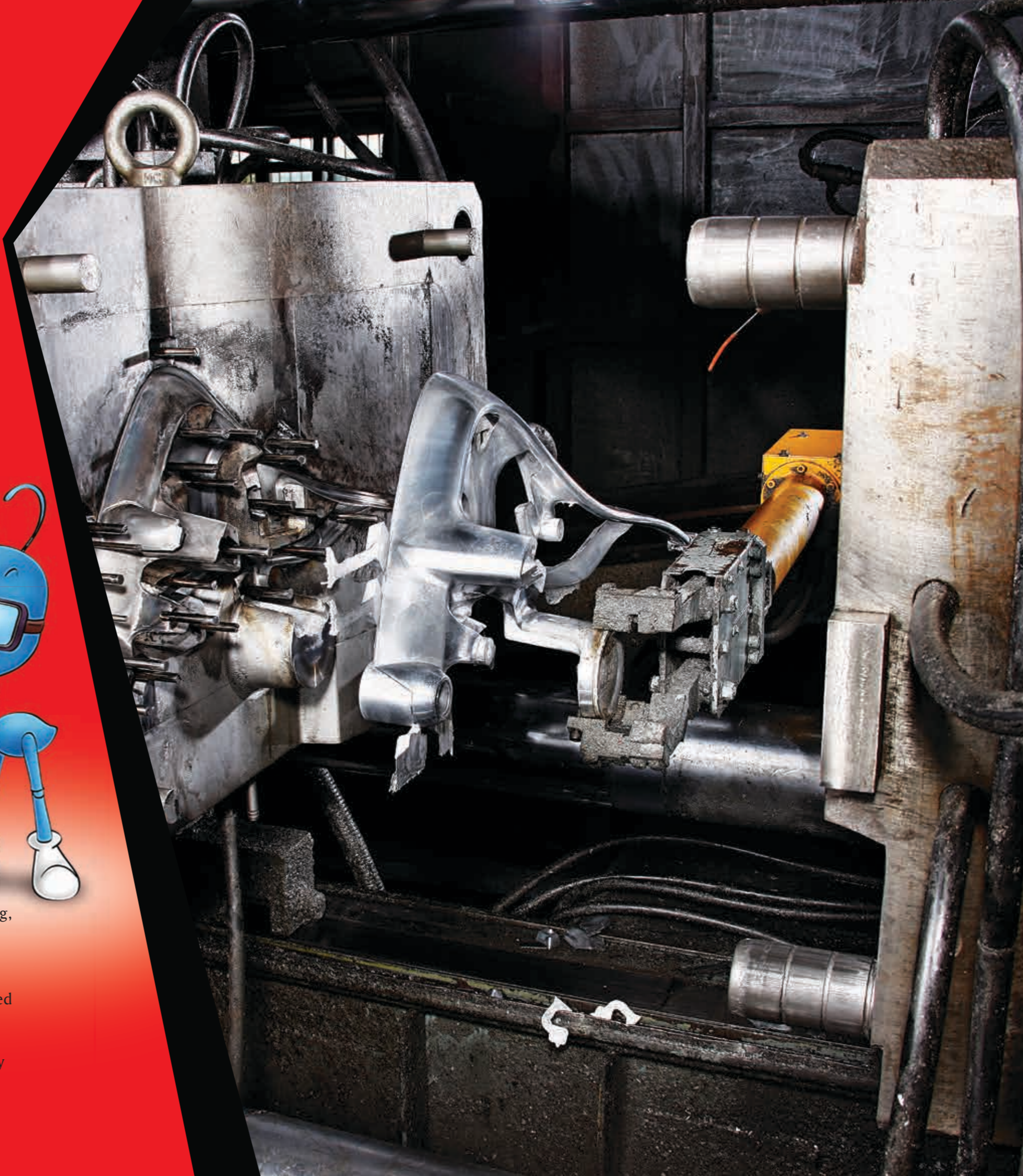
- Automated and manual skilled machining operations include drilling, Tapping, and reaming.
- Mechanical finish includes tumbling, vibratory finishing, burnishing, Shot blasting, and buffing.

Product Finishing

- Include electroplating, dichromating, painting, powder coating, and anodizing.

Assembly Capabilites

- Fully automated and semi-automated equipment design and building for precise demand assembly.
- Skilled & technical manual assembly for complex product.

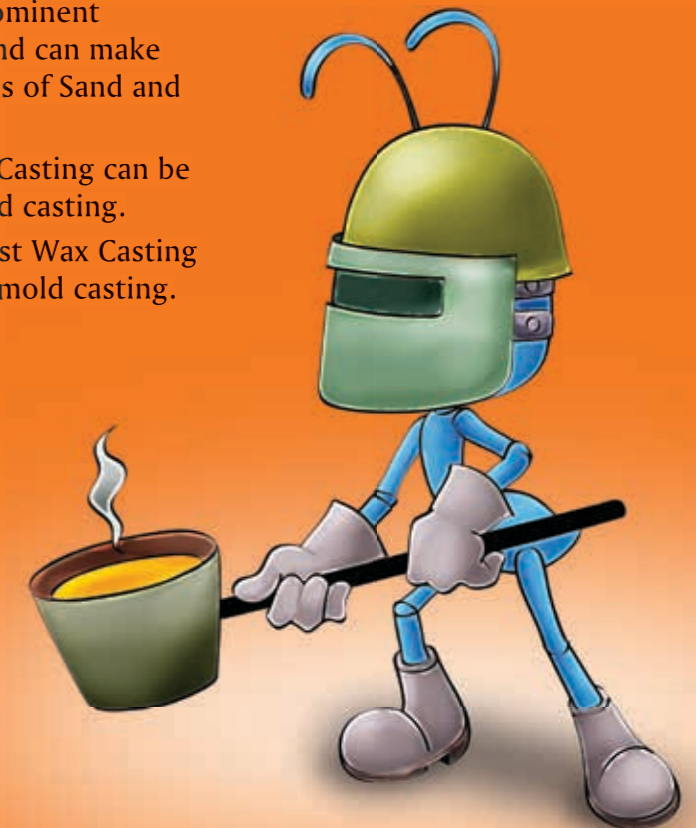




LOST WAX CASTING

Lost Wax Casting occupy a prominent position in casting industry, and can make up for the imperfect conditions of Sand and Gravity Die Castings.

- The dimension of Lost Wax Casting can be more precise than sand mold casting.
- The surface roughness of Lost Wax Casting can be more fine than sand mold casting.
- The strength of Lost Wax Casting is stronger than High Pressure Die Casting.
- The sand shell of Lost Wax Casting can resist more higher temperature than the steel mold of Gravity Die Casting.



GRAVITY DIE CASTING

Gravity Die Casting is still the indispensable Casting method nowadays despite its time existence is remote, and it is applicable to the facts when the castings require high tensile and bending strength process, or good weathering resistance condition.

In addition to carrying out the temper treatment and precision machining process on Gravity Die Casting products, we also provide general & hard anodizing treatment service for this kind of casting.





FORGING

YOUR HIGH QUALITY SOURCE FOR STEEL ALUMINUM, AND BRASS FORGINGS, MACHINED AND FINISHED, ASSEMBLED.

For the parts that require special shape and high strength requirement, it is suitable to adopt this kind of manufacturing method that will provide more of its value added by supporting with mechanical re-process, heat treatment, surface finish and even assemble into complete products with other different material components or with components that manufactured in different method.

Forging Parts for :

Automobile, Electronic Industry, Petroleum Industry, Motorcycle, Mechanical Industry, Hydraulic System, Bicycle, Ship-building Industry, Agricultural.



Capabilities including:

Press

Power presses up to 1600 ton capacity.

Secondary Operations

Automated and manual skilled machining operations including drilling, tapping, reaming, and milling. Mechanical finish including tumbling, vibratory finishing, burnishing, shot blasting, and buffing.

Product Finish

Includes electroplating, dichromating, painting, powder coating, and anodizing.

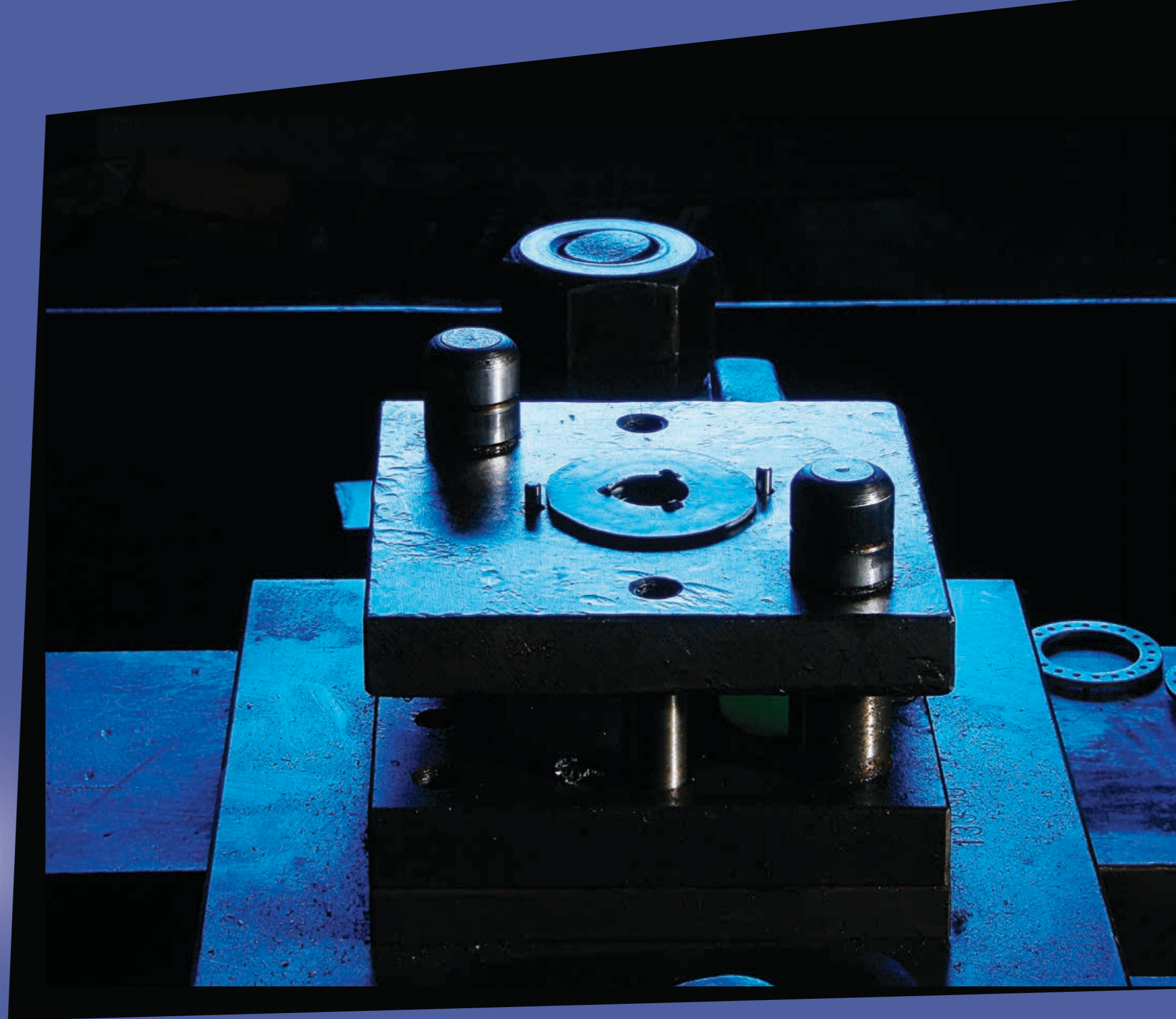
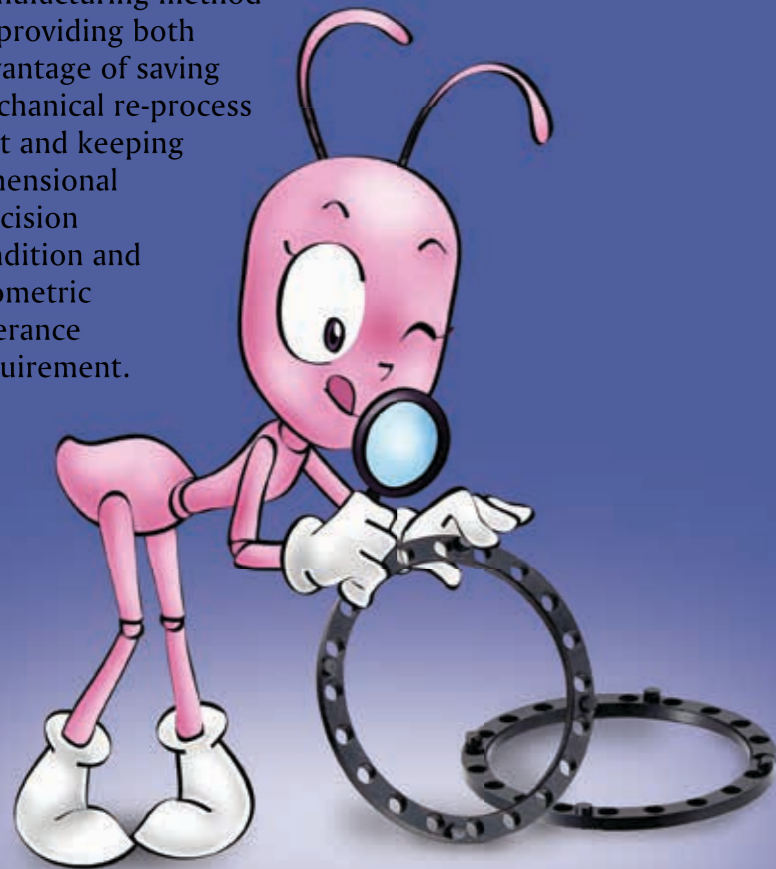
Assembly Capabilities

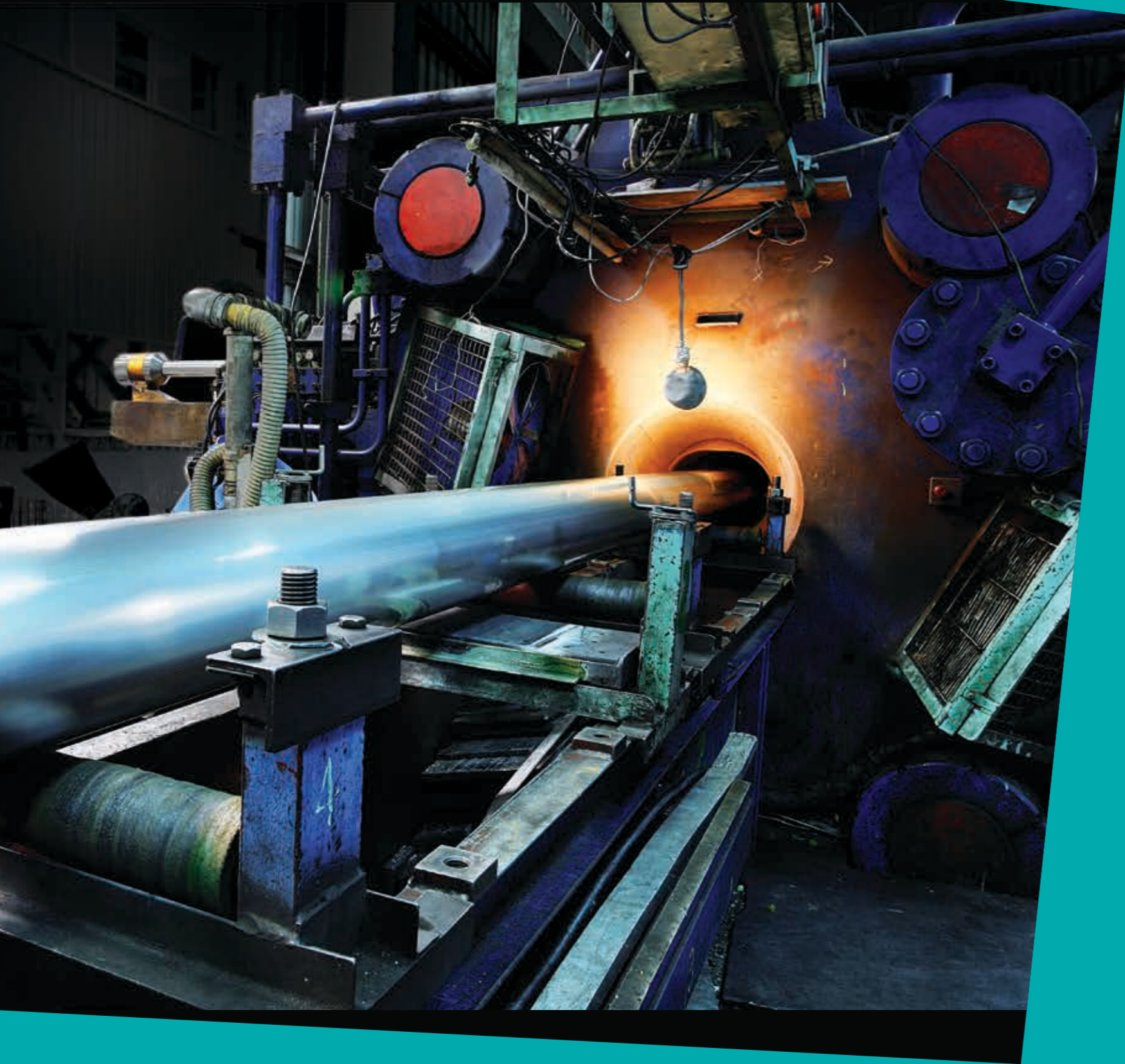
Fully automated and semi-automated equipment design and building for precise demand assembly.

Skilled & technical manual assembly for complex product.

FINE BLANKING STAMPING

For the stamping parts with plate thickness between 0.5 ~ 12mm, it is the most appropriate manufacturing method by providing both advantage of saving mechanical re-process cost and keeping dimensional precision condition and geometric tolerance requirement.





ALUMINUM EXTRUSION

To promote the value added of AL Extrusion Profile, it appears rather important that the secondary precision machining and surface treatment to be processed on this kind of extrusion.

Beyond question, it will create more value added for customers if the extrusion could be assembled into complete products by us throughout several other different kinds of materials.

Extrusion Machine

660 Tons -1 Set

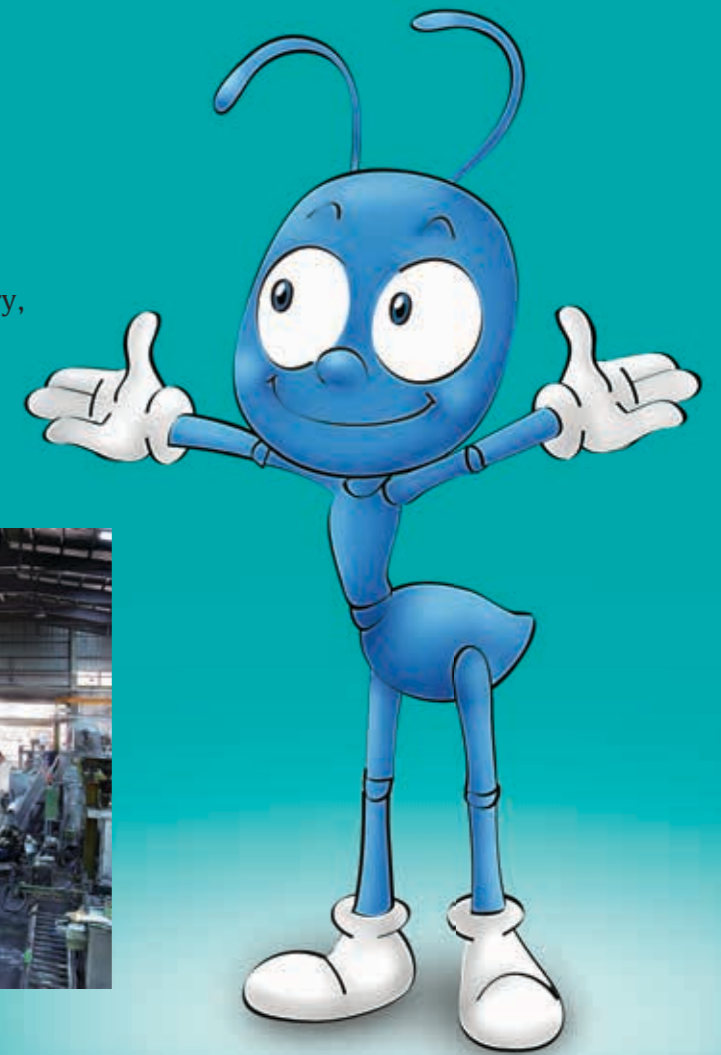
1000 Tons -1 Set

2000 Tons -3 Set

2400 Tons -1 Set

Components for:

Automobile Industry, Petroleum Industry, Computer Industry, Mechanical Industry, Electrical Industry, Hydraulic System, Office Furniture.



MIM

Metal Injection Molding Parts (MIM)

MIM is the ideal way to manufacture parts that is applicable to the conditions of follows:

- when the strength requirement is not so critical on casting.
- and when some of the precised dimension cannot be approached by Die Casting method.

Even more it will reveal value added of products if parts need to be supported with partial precision machining, heat treatment, then with fully assembly of the products.

Advantages of Metal Injection Molding

Complex Geometries, Less Machining, High Density, High Strength, Design Flexibility, High Volume Production, Cost-effective Way, Low Lead Time.

MIM is the economical choice for small, close tolerance, complex, and strength demanding components.

MIM parts

Orthodontics, Power & Hand Tools, Automotive, Electronics, Medical, Communications, Computer Consumer Products, Nozzles, Sewing Machine.

Materials

Stainless Steel, High Carbon Steel, Low Alloy Steel, Tool Steel, Magnetic Materials, Heat-resistant Alloys, Titanium Alloys.

PM

Powdered Metal Parts

Nevertheless, the precision parts with dimensional tolerance requirement is very suitable to adopt this kind of manufacturing method.

P/M parts

Automobile, Motorcycle, Gear Industry, Business Machine, Power tool, Electrical, Computer, Mechanical Industry, Lock.





PLASTIC INJECTION MOLDING

To assemble semi or complete products with different material components that meet our customers satisfaction, we cooperate with our subcontractors of plastic and synthetic rubber injection over these 30 years to manufacture complicate parts and the parts with requirement of high difficulty.

Molding Parts for:

- Computer Cooling Fan
- Camera Industry
- Industrial Sewing Machine
- Gear Industry
- Electronic & Mechanical Industry
- Fax & Copy Machine
- Office Furniture



SECONDARY MACHINING & ASSEMBLY

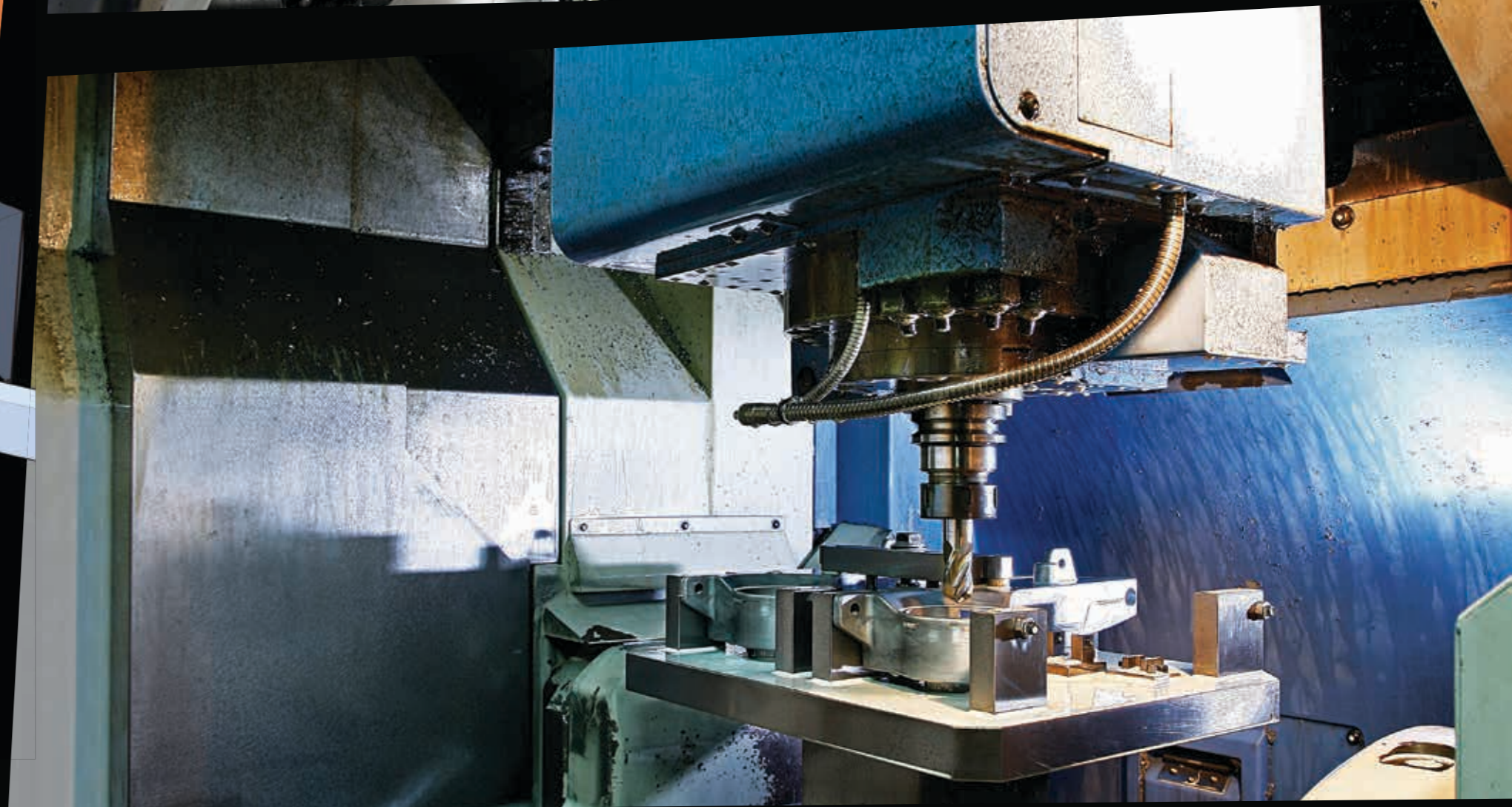
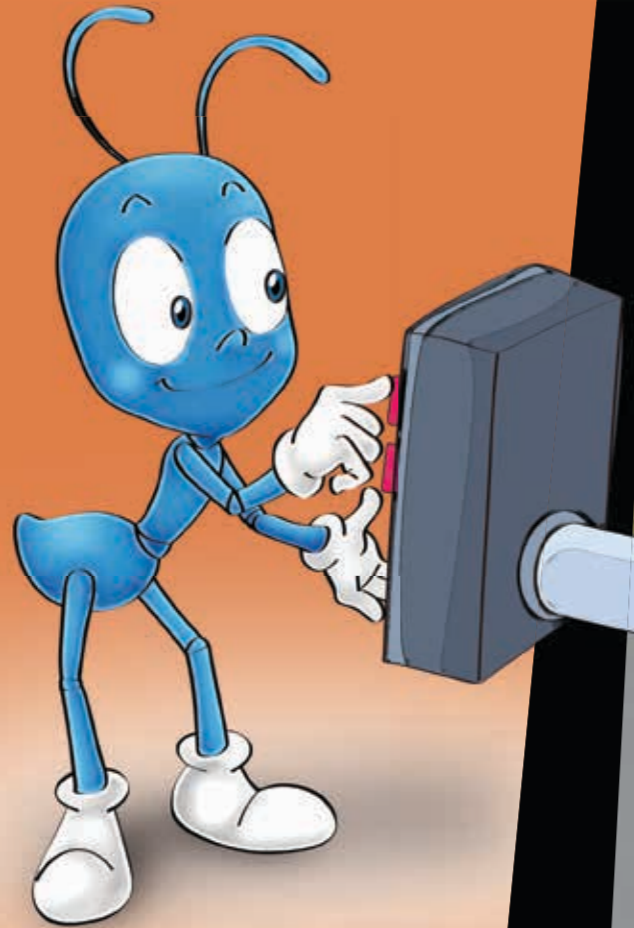
EXPERIENCED AND SKILLED CRAFTSMEN BACKED BY STATE-OF-THE-ART EQUIPMENT ENSURE HIGH QUALITY, EFFICIENT PRODUCTION.

Capabilities including:

- CNC Turning 2, 4, 5 axis
- CNC Milling-Vertical & Horizontal
- CNC Drilling, Tapping
- Multi-Spindle Drilling, Tapping
- Drilling-Gun Drill
- CNC gear hobbing
- Centerless Grinding
- Surface Grinding
- Internal Grinding
- Lapping
- Broaching
- Drilling, Tapping, Milling-Special Function Machine

Components Material:

- STEEL ALLOY
- STAINLESS STEEL
- ALUMINUM
- BRASS
- ZINC





VERNAL is a technical, professional, effective manufacturer of precision machined parts and complete components assembly. We pride ourselves on excellent engineering and manufacturing expertise from machining to market-ready products.





SURFACE TREATMENT

Surface treatment is the final manufacturing procedure of all kinds of parts. The surface finish process that our professional subcontractors provide including:

- Shoot Blasting
- Polish
- Chemical Polish
- Chemical Etching
- Anodizing
- Electric Plating
- Wet Painting
- Powder Coating
- Electrolytic Colouring Coating Etc



QUALITY CONTROL





MEASURING FACILITIES

■ CMM (Coordinate Measuring Machine)

ZEISS CONTURA G2	X-Y-Z= 1000 - 1600 - 600 mm	1
ZEISS CONTURA G2	X-Y-Z= 600 - 1000 - 600 mm	1
ZEISS CONTURA	X-Y-Z= 600 - 1000 - 600 mm	1
ZEISS WMM850.	X-Y-Z= 800 - 1200 - 600 mm	1

■ Salt Water Spray Testing

CHERN JIA. SST-CB	1
CHUO SEISAKUSHO. THA-11 (Electrolytic Plating Thickness Tester)	1

■ Hardness Testing

FUTURE-TECH.LC-200RB (Rockwell Type Hardness Tester)	1
FUTURE-TECH. FM-700 (Microhardness Tester (HV))	1

■ Projector

TOPCON. VP300D	1
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■ Surface Roughness Measuring

TESA. RUGOSURF 90-G (Surface Roughness Gauge)	1
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■ Arc/Spark Optical Emission Spectrometry(OES) Analyzer

SPECTRO SPECTROMAXx LMX 06	1
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MACHINING FACILITIES

■ YAMAZAKI MAZAK VARIAXIS 500-5X (CNC Vertical 5 - AXIES Machine Center)	1
■ MITSUI HU50A-1 (CNC Horizontal 4 - AXIES Machine Center)	1
■ YAMAZAKI MAZAK INTEGREGX 100-IISY (CNC Turning and Milling Compound Machine)	1
■ YAMAZAKI MAZAK INTEGREGX 200-IVSY (CNC Turning and Milling Compound Machine)	1
■ YAMAZAKI MAZAK INTEGREGX 200-IIISY (CNC Turning and Milling Compound Machine)	1
■ MORI SEIKI SL-25-Y (CNC Lathe.)	2
■ MORI SEIKI SL-15 (CNC Lathe.)	1
■ FANUC T14 i A (Tapping Center .)	3
■ FANUC T14 i E (Tapping Center .)	1
■ Horizontal Special Function Drilling & Tapping Machine	7
■ Vertical Special Function Drilling & Tapping Machine	30
■ YCM Machine Center NSV102A	1
■ YCM Machine Center NDV102A	1



GROWING OUT OF MUD, THE LOTUS BLOOMS PURE AND UNSTAINED.

The Lotus is clean even growing in the muddy pond. It is so pure, bright and elegant . We select the characteristics of Lotus as the goal to pursue.

We are creating a clean and humanized operation environment, and look forward to providing you with quality engineering and manufacturing solutions for your project.



It's the accomplishment
achieved by our
teamwork.

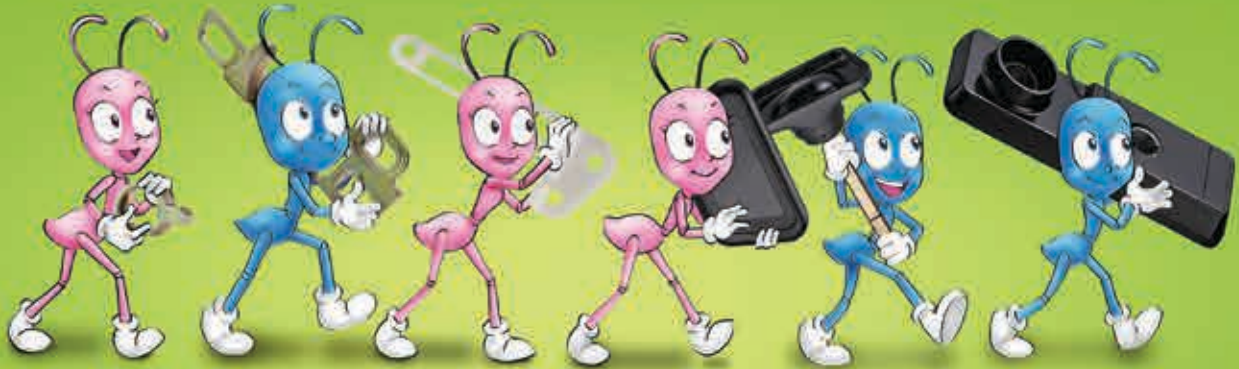
WOW!





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