

ENGINEERING & MANUFACTURING SERVICES

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Applications

Engineered tooling solutions has experience and expertise in design and manufacture of a wide range of tools. The excellence in quality and reliability in tooling flows through various product lines serves by the tool room. The services find application in:

- Thermoset and thermoplastic moulds
 - Injection moulds
 - Compression moulds
 - Transfer moulds
- Press tools
 - Progressive dies
 - Lamination tools
 - Carbide insert tools
- Pressure die casting dies

Target Countries

USA, Europe, South Africa, Iran and Middle East

L&T holds patents for some of their processes and products.

Organisation

Larsen and Toubro Limited, Engineered Tooling Solutions

Moulds for Injection Moulding

Description

Supreme's state-of-the-art technology centre at Mumbai is the largest mould development facility in India. It is also the most advanced unit of its kind in the country featuring new generation equipment and sophisticated quality assurance systems.

The centre is equipped to handle the entire gamut of mould production operations of a turnkey basis: from product design to prototype making, to mould development, manufacture, proving and trial.

The centre also offers moulding facilities to its clients, if they so desire. The company's state-of-art plants offers the best moulding facilities. An array of moulding machines with locking tonnage ranging from 80 to 250T stand ready to handle the most challenging projects including moulds weighing upto 12 kg a piece.

Process from concept to finished moulds

The journey from concept to finished moulds is:

- New Generation CAD systems are employed to create 3D Models of both the cavity and core - speedily and accurately matched to specifications
- These designs are then brought to life at the centre's sophisticated machine shop. The world's most advanced intricate form machining equipments shapes the mould into reality using powerful 3D software. CNC machines deliver precision that is measurable in microns
- Mould proving and trial are undertaken on an intensive and extensive basis
- Internationally certified quality control systems and procedures are employed throughout to ensure flawless, uncompromising excellence
- To enhance the centre's formidable capabilities even further, electronic digitising equipment and large die-spotting machine will join the existing fleet of sophisticated hardware

Application

The products made from Supreme moulds are:

- Automotive Components
 - 4 wheelers: Radiator grills, interior trim, scuff plates, mudguards, mud-flaps, corner bumpers, bezels, instrument panels, glow boxes and lids, water deflectors, body protectors etc
 - 2 wheelers: Handlebar covers, seat trim, mudguards, shields, seat bases, etc
- Electronic Appliance parts
 - Washing machine bases, balancer cases, door windows, door bezels, lids. Cabinet for TVs, computer and audio systems. Water heat exteriors
- Air conditioner and Refrigerator components
 - Front grills, kick plates, chill trays etc
- Moulded Furniture
 - Garden furniture, mass seating systems, children's furniture
- Crates
 - Industrial crates, special purpose and custom developed crates
- PVC pipe fittings
 - Fittings for agricultural, SWV, SWR, ASTM and plumbing pipes
- Food serviceware
- Thermoforming tools

Advantages

By collaborating with Technology Centre for Mould Development one benefits from:

- Access to top quality moulds at very economical prices
- Successfully implement material substitution in the products (like replacing heavy metal components with light metal, low cost plastic parts)
- Expand your product range at lower expenses
- Turn your enterprising new ideas into viable reality

Target countries

USA, Canada, Japan, China, Korea and European Union countries

Organisation

Supreme Industries Ltd, Technology Centre.

Press Tools / Jigs and Fixtures

Description

GKW manufacturer of press tools, jigs and fixtures. The range of product includes miniature components to large auto components

Advantages

They have a fully equipped modern tool room with state-of-art machines and heat treatment facilities. They have skilled and trained manpower.

Applications

These tools, jigs and fixtures find application in

- Automotive
- White goods
- Electrical
- Electronics
- General engineering industry

Target countries

USA, UK, France, Spain, Italy, Germany, Argentina, Korea and Indonesia

Organisation

GKW Ltd.

Specifications

Major Tool-room Machines

Sr. no.	Type of machine	No. of machines	Max size of a job that can be machined in mm		
1	Vertical Turret Lathes	2	1220 Dia	500 Ht	
2	Plano Miller	1	4500 Lg	1250 Ht	1200 Ht
3	3d Milling Machines	4	1500 Lg	750 W	450 Ht
4	Heavy Surface Grinding Machines	5	1820 Lg	610 W	710 Ht
5	Rotary Table Grinding Machines	6	1220 Lg	305 Ht	
6	Jig Boring Machines	5	1520 Lg	1010 W	550 Ht
7	Jig Milling Machines	1	510 Lg	450 W	50 Ht
8	Jig Grinding Machines	4	530 Lg Max Bore 200 Dia With Adaptor	305 W	90 Ht
9	Spark Erosion Machines	2	1000 Lg	1000 W	470 Ht
10	Visual Form/ Profile Grinding Machines	4	150 Lg	355 W	330 Ht

Product Design and Engineering

Description

Axiom Consulting provides customers industrial design and product engineering support for developing highly innovative products, and thus positively impact customer's product development.

They are leading "pure play" Product Design and Product Engineering service provider in India. They are involved with the customer in full-product development cycles they work right up to the product commissioning. They create the best value for their customer through ideation, design and engineering.

Service Offered

Axiom provides outsourced product development services to OEM and engineering corporations. Their service offered include:

- Industrial design
 - Class A surface generation from point cloud data
 - Conceptualising
 - Ergonomics
 - Packaging
 - Mock-up models
 - Product graphics
- Design
 - Class A surface generation from point cloud data
 - Concept design refinement and STL generation from mock up models
 - 3D computer aided surface and solid modeling
 - Solid/Surface model development of plastic parts for mould development purposes
 - CAD model healing
 - Drafting, detailing and GD&T
 - Assessment of manufacturing feasibility
- Engineering
 - Structural analysis
 - Vibration analysis
 - Heat transfer analysis
 - Impact analysis, drop test simulation
 - Topology, size and shape, weight optimisation
 - Finite element modeling
 - Mold flow simulation
- Engineering Automation
 - Automation tools for productivity enhancements within design/CAE groups
 - Engineering automation tools to address specific customer needs e.g. wizard to automate durability analysis of a steering system
 - Customizing PDM modules for enterprise needs
 - Interfacing CAD/CAE tools with PDM tools
- Prototyping
 - Vacuum formed prototypes
 - Clay, Foam and Thermocole models
 - Poly Urethane Foam models
 - CNC or Rapid prototyping

Advantages

Axiom offers several benefits to its clients:

- Strong engineering support for Industrial design resulting in efficient well engineered products
- India location offers attractive cost structure
- Product development and engineering experience
- Hybrid delivery model (customer location and axiom) adds significant value to customer
- Offshore project management experience
- Ability to ramp up large implementation teams
- Network of partner companies and advisors with domain expertise, who can be leveraged for specific tasks in different stages of product development
- Also well suited for low risk, long term product development (skunk works)

Applications

Some of the products of Axiom include:

- Multi utility vehicle for use in Industry campuses, hotels, resorts and golf courses
- Conceptualisation, design, engineering and prototyping of table top mounted tough sheeter targeting small and medium size bakery and pastry units
- Two wheeler vehicle and component concept sketches
- Dash mounted GPS receiver for cars and trucks. The objective of this simulation was to study the performance characteristics of the GPS receiver set to critical drop tests
- Full vehicle durability and impact simulation (FMVSS, US NCAP) and mould filling simulation
- Computer Aided Engineering tools and methods for up front design validation and optimisation. Structural, drop testing, optimisation and mould filling simulation
- Stress, durability, thermal analysis, topology, size, shape optimisation of automotive components and sub assemblies

Target countries

USA, Canada, Japan, China, Korea and European Union countries

Organisation

Axiom Consulting Pvt. Ltd.

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Engineering Design Solutions

Description

Hoyt specialises in offering engineering design solutions for plastic, sheet metal and die cast parts for automotive and non-automotive applications.

Service offered

The engineering services offered involve part behavior modeling, tooling design, tooling performance analysis and simulation, CNC programming etc. The solutions are focused on:

- Plastic flow analysis
- Sheet metal deformation analysis
- Pre-processing of models for mesh generation
- Pressure die casting process simulation
- Component manufacturing process simulation
- 3D/2D mould designs
- Sheet metal tool designs
- Jigs/fixture designs
- Core/cavity extracts
- Plastic mold design
- Structural analysis
- Shape optimisation
- Part reverse engineering
- 3D data conversion
- CAD geometry healing
- Design FMEAs

Advantages

Hoyt engineers have experiences full life cycle of product development in automotive parts, connectors, washing machines, telecommunication equipments, instrumentation panels and air-housing and filter-parts. This experience incorporates digital simulation of product assembly, tooling designs and CNC programming for critical parts, trouble shooting of product and tooling as well.

Engineers provide on-line support to various tool rooms in India and abroad from data management and conversion, tool designs and CNC programming. Well established documented procedure is followed to maintain error-free deliveries.

Mould designers are exposed to branded hot runner system design and optimisation. Specialised software is used for data migration between various applications and 3D data handling.

Customer base includes major engineering design centres in India and commercial as well as captive tool rooms in India and abroad.

Target countries

USA, Canada, Japan, China, Korea and European Union countries

Organisation

Hoyt Engineering Solutions Pvt. Ltd.

Tool Room Services

Description

The captive Tool Room of Kinetic Group which was established in 1980 has seen continuous enhancement both in technology & competency, since its inception. This tool room has been commercialized and launched as Kinetic Technologies in Jan 2004 to offer cost effective "Art to Part" or tailor-made services to the clients globally.

Services offered

It is a one stop solution for CAD/CAE/CAM and tool room needs. It offers the following services:

- Rapid prototyping/Pre-production tooling manufacturing.
- Reverse engineering
- 3D model generation
- Process engineering
- Pressure die casting die design
- Press tool design
- Jigs/fixtures and gauge design
- Manufacturing of tools: Die, mould, jigs, fixtures & gauges

Application

Plastic, PDC and press tool needs for automotive, white goods industry, electrical/electronics and other many segments of industries.

Product Portfolio

- Press Tools
 - Size: 1750x1300x1500 mm
 - Weight: 5 Tons
 - Complexity: Petrol tanks, skin panels and mudguard
- PDC mould manufacturing
 - Size: 3000x1300x1400 mm
 - Weight: 5 Tons die weight or 1600 Tons die casting m/c
 - Complexity: Cylinder head for four stroke engine (LPDC) and crank cases (PDC)

Advantages

Kinetic technologies has several strengths being such an old tool room. These include:

- Already existing & established "State-of-the-art" infrastructure with latest & emerging technologies in combination with modern machining facilities. Well established "Engineering Center" equipped with latest CAD/CAM/CAE tools
- Vast research and development experience
- Proven track record with well established domain knowledge specifically in the areas of plastic, PDC & press tool needs for automotive applications
- Expertise in full life cycle of product development
- Experienced & well trained team with proven processes & quality procedures,
- Can move up the value chain to provide greater complexity services for design & manufacturing needs
- Stable management & long term continuity
- Flexibility & open approach with the clients with a view to function as an extended partner

Target countries

USA, Canada, Japan, China, Korea and European Union countries

Organisation

Kinetic Technologies

Tool Manufacturing and Engineering Services

Description

Tool Manufacturing

NTTF Industries Limited is equipped with the state-of-the-art machines to manufacture high precision tools, which is an essential requirement for manufacture of quality products. NTTFIL Tool Rooms are one of the leading tool rooms in the country.

Engineering Services

NTTF Industries Limited provides product design & development services.

Services Offered in Tool Manufacturing

NTTFIL has a well equipped tool room to manufacture:

- press tools
- Injection/compression moulds
- Diecasting dies
- Jigs, fixtures and gauges
- Assembly line workstation
- Tooling
- End of line testing station
- Flexible manufacturing system

Engineering Services

The component manufacturing division at NTTFIL manufactures the following:

- Solid/surface modeling of sheet metal/moulded and cast parts
 - Part modeling
 - Assembly
 - Mould (core & cavity extraction)
 - Manufacturing (tool path generation)
 - 2 D drawing generation
- Finite element analysis
 - Plastic flow
 - Structural analysis
 1. Linear statics
 2. Nonlinear statics
 3. Advanced dynamics
 4. Thermal analysis
 5. Computational fluid dynamics
 6. Electro magnetic analysis
 7. Coupled field analysis
 8. Optimisation
 - Metal forming
 1. Sheet metal stamping
 2. Forging
 3. Multi stage process
 4. Super plastic forming

- Crash and impact analysis
 1. Sheet metal stamping
 2. Metal forming
 3. Automotive crash testing
 4. Automotive occupant safety
 5. Airbag folding and unfolding
 6. Airplane crash
- CNC program generation
 - Program generation
 1. Generation of NC tool path in neutral format
 2. Post processing for specific CNC controller

The tool path for any component is generated from its solid or surface model. The tool path generated is in the neutral format which can be post processed for specific CNC controller by making use of the post processors.
- Product development tools
 - Rapid prototyping
 - CAD/CAM/CAE
 - 3D scanner

Target countries

USA, Canada, Japan, China, Korea and European Union countries

Organisation

NTTF Industries Ltd.

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Engineering Design Services

Description

Pricoltech helps clients across the globe by providing engineering design solutions. The specific services provided are:

- Engineering design solutions (2D drafting, 3D modeling, data translation, finite element analysis, product design, reverse engineering, tool design & manufacturing, rapid prototyping and sourcing)
- Electronics engineering solutions (turnkey embedded systems, real time embedded systems, PCB design and development and device driver development)

Advantages

Pricoltech provides high quality services at significantly low prices. The benefits for the clients are reduced engineering support costs, and reduced product turn-around time by concurrent engineering. Pricoltech also helps client focus on core activities while making non-critical activities profitable. The engineering resources can be augmented on need-basis rather than managing for peak requirements. Pricoltech helps client improve product quality through process conformance.

Application

The tools, techniques and services provided by Pricoltech are very useful for reverse engineering, tool design and manufacturing for plastic molds and press tools, detailing of tool elements for manufacturing as per FUTABA standards or customer specific standards and in sourcing components (machined, sheet metal and injection molded) and assemblies (mechanical, electromechanical and electronics).

Services

Product Design: Pricoltech provides end-to-end solutions for product design including engineering design changes and modifications; solid and surface modeling, detailed design drawings, finite element analysis, tool and sheet metal design. value engineering, statistical process control techniques and quality function deployment are some of the practical manufacturing methodologies applied for creating cost-effective designs.

Finite Element Analysis: FEA is used for structural analysis (static as well as dynamic), thermal analysis (steady state and transient) and contact analysis.

Data Translation: Pricoltech provides support for:

- Conversion of CAD data from one CAD package/file format into IGES, DXF, STEP, STL or other targeted transfer formats specified by the user
- Solid Modeling Conversion: 3D modeling, remodeling, 2D to 3D model construction, 2D detailed drawing, and model checking using Pro/ENGINEER, Inventor, Unigraphics
- Custom part library construction: Constructing new parts or converting existing parts cataloged and ready for streamlined design applications increasing both accuracy and efficiency
- Rasterisation of hard copy prints: Scanning existing prints into a rasterised format that can then be easily examined through typical viewers or accessed through most data management system utilities

Tool design, detailing and manufacturing of plastic flow moulds.

Target countries

USA, Canada, Japan, China, Korea and European Union countries

Organisation

Pricol Technologies

Calibration Services

Description

National measurement system is a vital infrastructure for the growth of all industrialised nations. It is a base, on which quality management of products and services rests. Globalisation of economy has brought in a competitive environment and it is essential that goods and services produced in the country are comparable in quality to the best available elsewhere in the world. In India, standardisation and quality measurements are ensured through institutional preparation of documentary standards, maintenance of national standards of measurements and their linkage to the international standards, enforcement of measurements system in the country and providing a network of testing and calibration laboratories to provide an unbroken chain of measurements to the national and the international standards.

Keeping in line with the international practice, India has adopted the international system (SI) for all measurements. This system rests on seven base units namely mass (kilogram), length (meter), time (second), temperature (kelvin) electrical current (ampere), luminous intensity (candela) and amount of substance (mole).

The National Physical Laboratory (NPL) has been assigned the responsibility of realisation, establishment, custody, maintenance, reproduction and updating of National Standards of Weights & Measures, representing the 'units' related to all physical parameters according to the International Systems of Units.

Services Offered

NPL offers calibration testing services for the industry which includes:

- Physio-Mechanical Standards
 - Length standard & dimensional metrology: Electronic liner gauges, linear scales, electronic distance meter, slip gauges, NC & CNC machine tools
 - Mass, density, volume & viscosity: Weight of F1, F2, E1 & E2 classes, balances, hydrometers, viscometers, barometers, pipettes, etc.
 - Temperature measurements: Liquid in-glass, thermometer, temp baths, standard platinum resistance & thermometer, heat pipes, resistance thermometer, detectors' differential thermometer, thermocouple optical, tungsten strip lamps
 - Force & hardness standards: Force proving rings, load cells, weight bridges, torque meter, push-pull gauges, etc.
 - Pressure & vacuum standards: Bourden gauge, dead weight tester, pressure transducers and transmitters, spinning rotor gauges, penning & pirani gauges, capacitance diaphragm gauges, manometer etc.
 - Photometry and Radiometry: UV source, UV meter, filters, lamps for luminous flux, luminance intensity, luminance, colour coordinates, photometer, irradiance calibration, infrared in scanner, infrared thermovision system, infrared thermometer, wave number and radiometer standard, transmittance filters, etc.
 - Infrared Radiation Standards
 - Acoustic standards: Condenser microphones, accelerometers, environmental industrial noise and vibration measurements, etc.
 - Ultrasonic standards and underwater acoustic measurements: Mechanical sector scanner, miniature hydrophones, ultrasonic therapeutic instruments, etc
 - Humidity standards: Hygrometer
 - Fluid flow standards
- Electrical and electronic standards
 - Time and frequency standards: Times, stopwatches, frequency counters, crystal oscillators, cesium and rubidium atomic clocks, etc
 - DC Standards: Digital multimeter, voltmeter, ammeter, resistor, oscilloscopic current shunts, calibration zener diodes, bridges, etc.
 - AC & LF standards: Digital multimeter, voltmeter, ammeter, resistor, oscilloscopic single and three phase power, energy meters, current shunts etc.
 - LF & HF impedance standards: Capacitors, inductors and resistors, capacitances & inductances bridges, LCR inductive voltage dividers, etc.

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