



KALYANI

Supreme Agility | Rich Legacy | Innovative Offerings

KALYANI GROUP



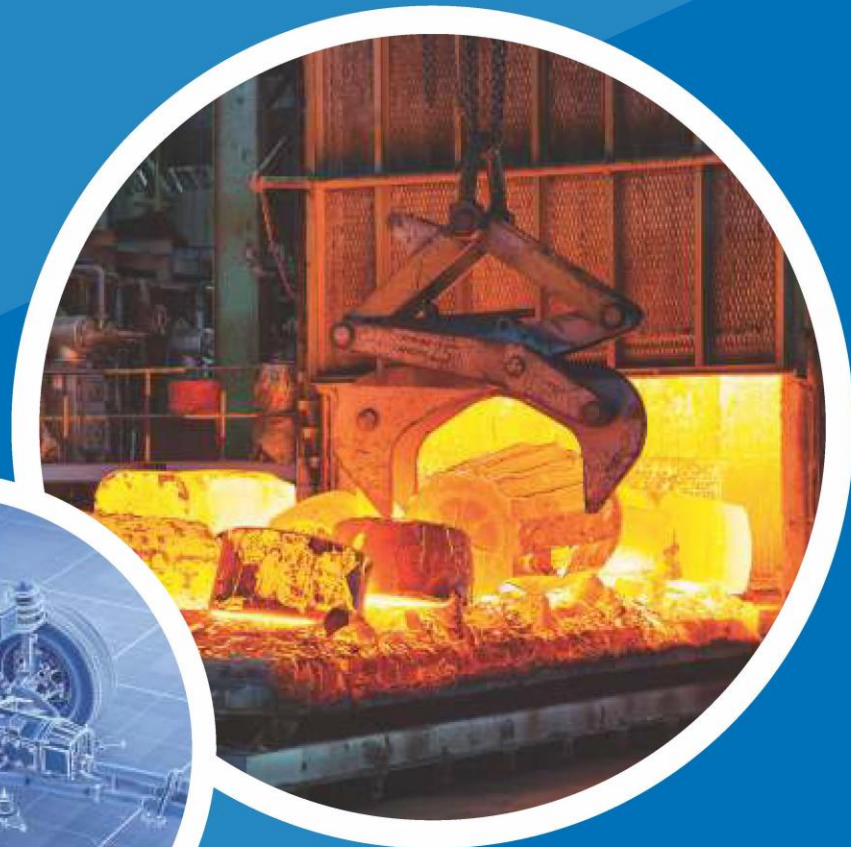
50+ YEARS OF
GLOBAL MANUFACTURING
EXCELLENCE



END-TO-END
ENGINEERING AND
TECHNOLOGY SOLUTIONS



AGILITY DRIVEN
BY THE STRENGTH OF
RELIABILITY





DREAM BIG

Future is here!

We, at the Kalyani Group, have been striving hard in our domain, since our inception in 1966. The Kalyani Group has witnessed and evolved during the global industrial revolutions which have taken place over the last few decades. We have broadened our horizons in the core fields such as Engineering Steel, Automotive, Renewable Energy, Urban Infrastructure and last but not the least – Specialty Chemicals. We have made this possible, without leaving our roots and the time-honoured, tried-and-tested methodologies which were proven to be true by our pioneers!

Being the “world’s largest, single location, forging facility consisting of fully automated forging press lines and state-of-the-art machining facilities,” we have always worked hard to achieve our mission, by setting the high standards of performance and excellence. Our eminent industry experts bring a wealth of knowledge through agile engineering and technology solutions, which ultimately adds insightful value to our customers’ businesses.

Change is the only constant in this world. Our USP is to adapt to innovative techniques and to stand out firmly on our strong foundation of five decades’ legacy of delivering guaranteed excellence.

Enabling you to conquer tomorrow by moving faster than others

It's critical to be agile and quickly respond to change. However, in order to respond rapidly, stability is a primary requirement. Guided by the visionary leadership of Mr. B. N. Kalyani, with strong emphasis on market leadership through in-house technology innovation, the Kalyani Group brings with it the dynamic capability to move fast—supported by its decades-old stable foundation.



Indian multi-national leading company with higher technological, core engineering and robust manufacturing capabilities in critical domains.

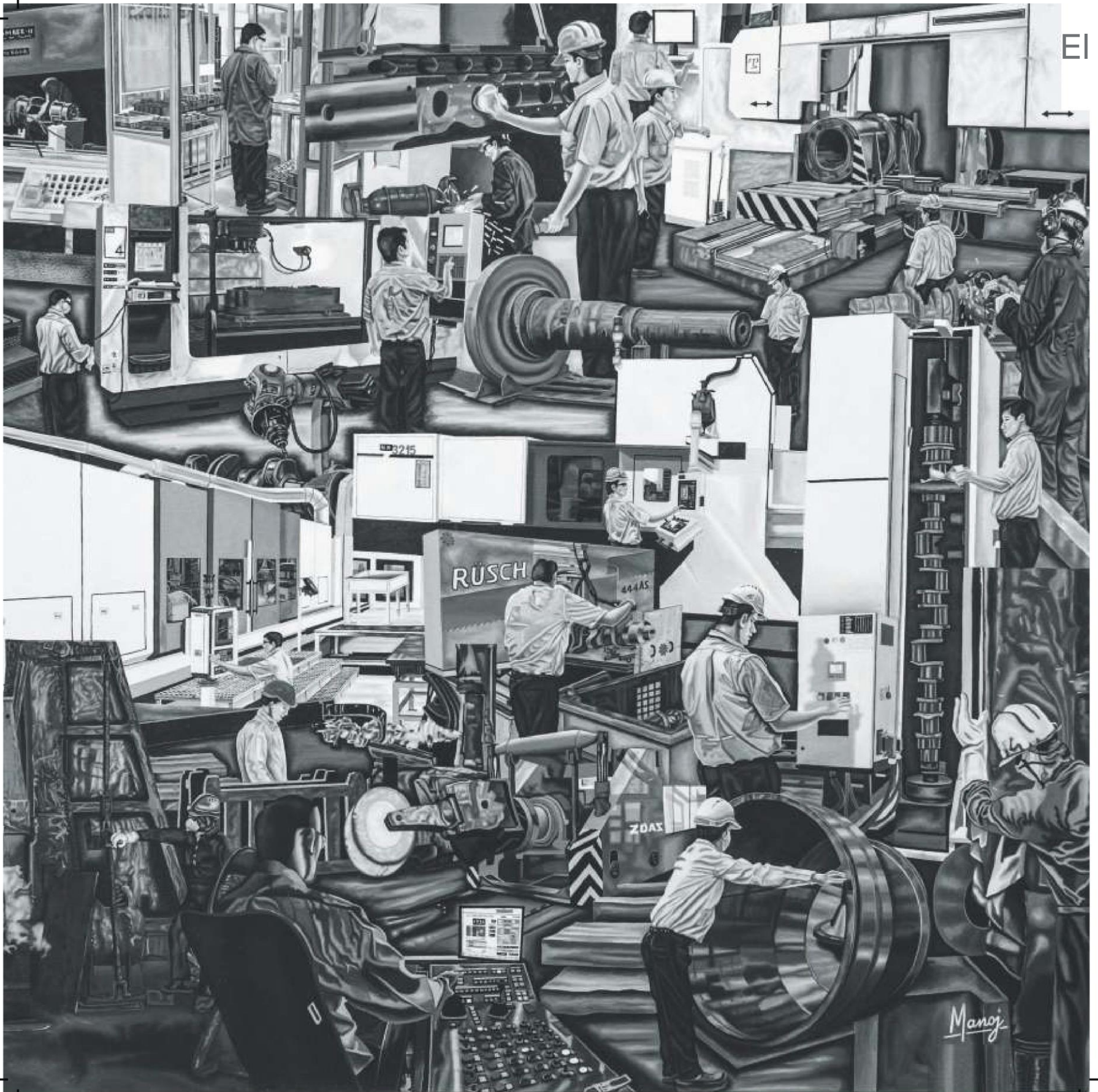
Manufacturing across
20 locations globally



Turnover
~ 3 Billion USD


Market Capitalization
> 6 Billion USD

Global Workforce
of **10,000+** employees



El

Mangj



VERTICALLY
INTEGRATED
TO BE
FUTURE READY

Being ready to deliver end-to-end solutions to create a manufacturing footprint across India, US, UK, France, Germany & Sweden, the Kalyani Group of Companies provide path-breaking solutions in engineering and manufacturing, which open up new opportunities across all industrial sectors. The strength of the Kalyani Group of Companies is our unique capability to build all technology solutions in-house, which makes us the owner of all Intellectual property (IP). This enables us to leverage our innovative solutions, using our cutting-edge and top-notch technologies across the Group.



ENGINEERING STEEL

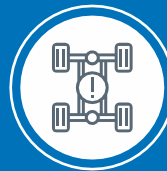
- ▶ Kalyani Steels Ltd.
- ▶ Saarloha Advanced Material



CORE MANUFACTURING

INDIA

- ▶ Bharat Forge Ltd.
- ▶ Kalyani Technoforge Ltd.



AUTO SYSTEMS

- ▶ Automotive Axles Ltd.
- ▶ Kalyani Maxis Wheels Pvt. Ltd.



E-MOBILITY SYSTEMS

INDIA

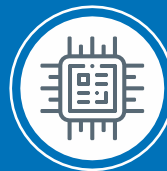
- ▶ Tork Motors

UK

- ▶ Tevva Motors

GERMANY

- ▶ REFU Drive



DEFENCE SYSTEMS

- ▶ Kalyani Strategic Systems Ltd.
- ▶ Analogic Controls Ltd. (Embedded Systems)



INFRASTRUCTURE

- ▶ BF Utilities
- ▶ Khed City (SEZ)



SPECIALTY CHEMICALS

- ▶ Hikal Chemicals

KALYANI GROUP OF COMPANIES - OVERVIEW

KALYANI STEELS LTD.

- Established in 1973, Pune
- Capacity: 650,000 TPA
- Pune - Electric Arc Furnace & Hospet - Blast Furnace
- Leading Manufacturer of Low & Medium alloy steels
- Continuous caster & preferred steel supplier for various applications

SAARLOHA ADVANCED MATERIAL PVT. LTD.

- Location - Pune, India
- Capacity: 240,000 TPA
- Electric Arc Furnace
- Leading Manufacturer of Medium & High alloy steels
- Largest producer of ESR Products (3000 TPA) & Valve Steels (4800 TPA)



ENGINEERING
STEEL



KALYANI GROUP OF COMPANIES - OVERVIEW

BHARAT FORGE LTD.

- Established in 1961
- Location – Pune, India
- Capacity: 450,000 TPA
- Wide range of critical & safety components for automotive & non- automotive
- Forgings | Machined Components | Sub-Assemblies| Assemblies

BFL GLOBAL HOLDING COMPANIES

- CDP Bharat Forge GmbH, Germany
- Bharat Forge Daun GmbH, Germany
- BF AluminiumTechnik GmbH, Germany
- Bharat Forge Kilsta AB, Sweden
- Mechanique Generale Langroise, France
- BF PMT Technologies Inc., USA
- BF Aluminum, USA

KALYANI TECHNOFORGE LTD.

- Established in 1979
- Location – Pune, India
- Capacity: 50,000 TPA
- Forgings | Machined Components| Transmission Components



MANUFACTURING



KALYANI GROUP OF COMPANIES - OVERVIEW

AUTOMOTIVE AXLES

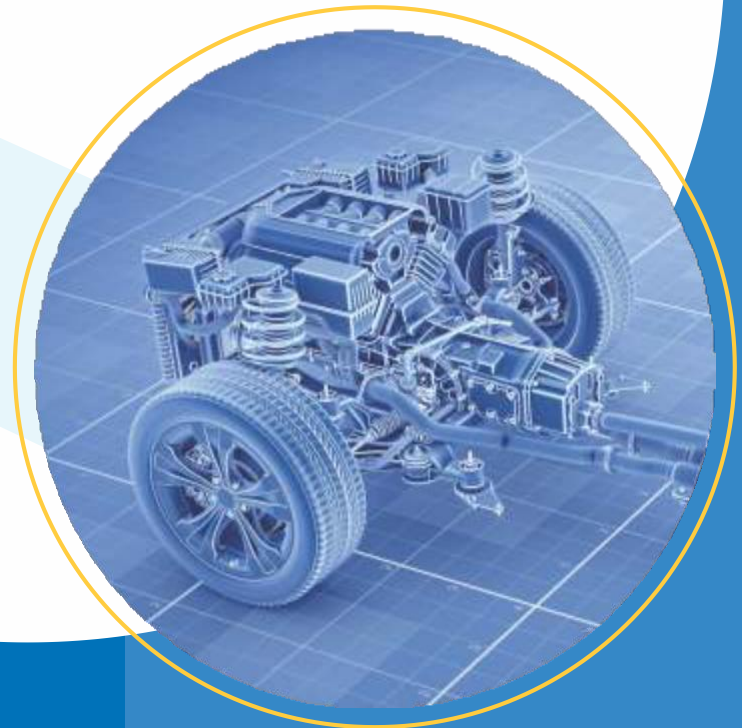
- Established in 1981
- Location - Mysuru, Karnataka
- Joint Venture between Kalyani Group & Meritor
- Largest independent manufacturer of Rear Drive Axle Assemblies in India

KALYANI MAXION WHEELS PVT. LTD.

- Established in 1996
- Location - Chakan, India
- Manufacturer of wheel rims using the flat stock, cold pressing and flow forming method
- It has a competitive edge over other wheel rim manufacturers



AUTO SYSTEMS



KALYANI GROUP OF COMPANIES - OVERVIEW

BF UTILITIES

- Infrastructure Business
- Nandi Infrastructure Corridor Enterprise
- Nandi Highway Developers Ltd. - Bangalore Mysuru Infrastructure Corridor
- Wind Energy Projects

KHED CITY (SEZ)

- Spread across 4200 acres with best-in-class infrastructure facilities
- It is a smart integrated industrial city in India

HIKAL CHEMICALS

- Established: 1988
- Location – Navi Mumbai, India
- Engaged in R&D, manufacturing and marketing of fine chemicals for the Pharmaceutical and Agrochemical industries



INFRASTRUCTURE
& OTHERS





**EMPOWERING
OUR
PARTNERS
TO STAY AHEAD
OF THE
COMPETITION**





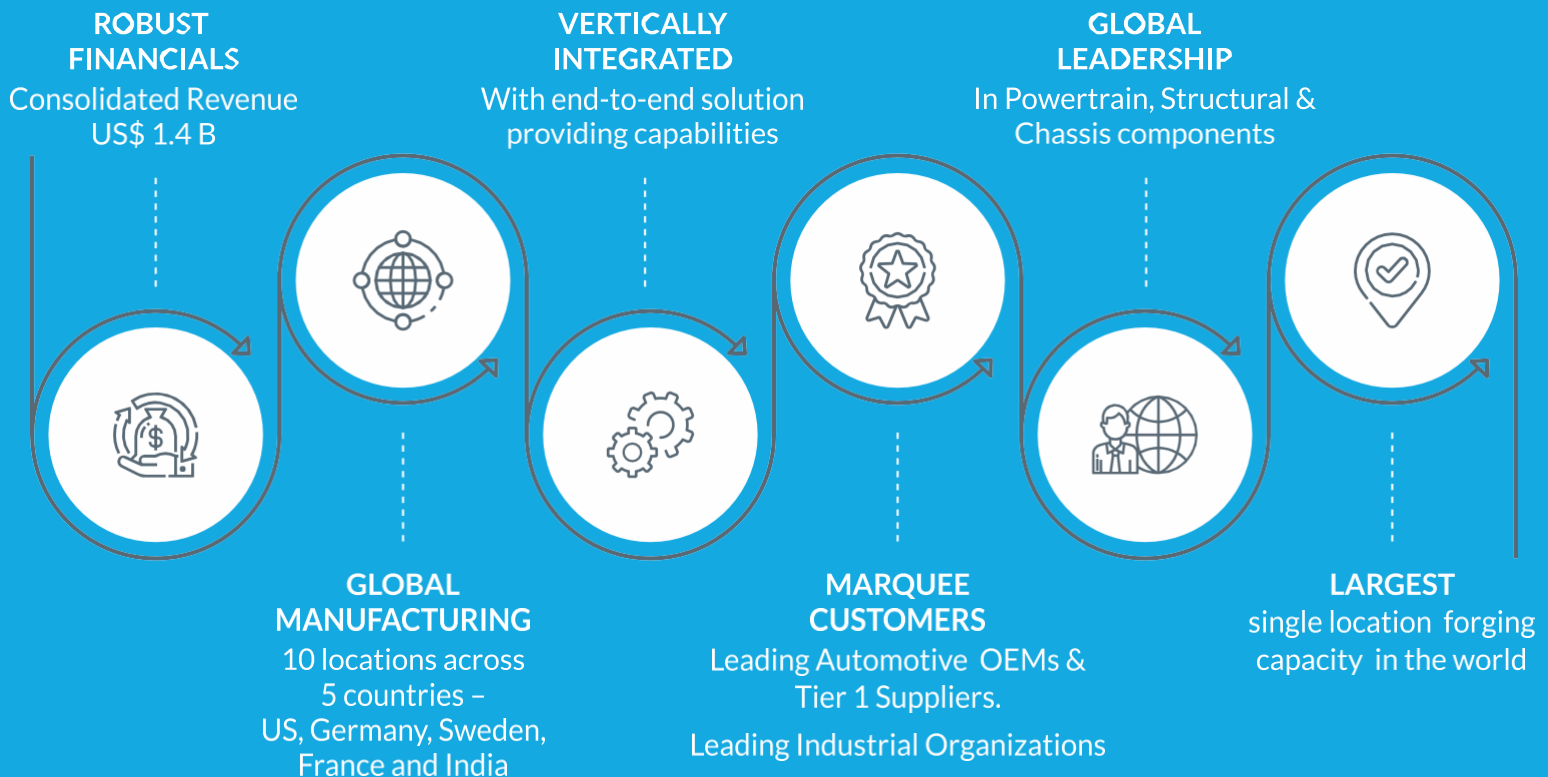
**OUR
BUSINESS
AGILITY
IS THE KEY
TO SUCCESS**

Bharat Forge Limited

Five decades of ...
Forging | Excellence | Trust

Bharat Forge Limited (BFL), the flagship company of the Kalyani Group has withstood the test of time to emerge as the world's largest forging company. It is amongst the best in the aerospace and automotive forging industry across the globe. BFL's success lies in its nimbleness—its ability to respond fast—by developing its own indigenous technology, and by consistently improving technical processes, adopting the latest cutting-edge, top-notch and path-breaking manufacturing processes and seamlessly training our workforce to evolve as an exceptional talent!

BFL- An Overview of the Kalyani Group's Flagship Company



One-stop solution for all your business needs!



Material



Designs & Simulations



Tools & Die Making



Forging &
Precision Forging



Machining & Precision
Machining



Gear Cutting



Specialized Heat
Treatment



Inspection & Testing

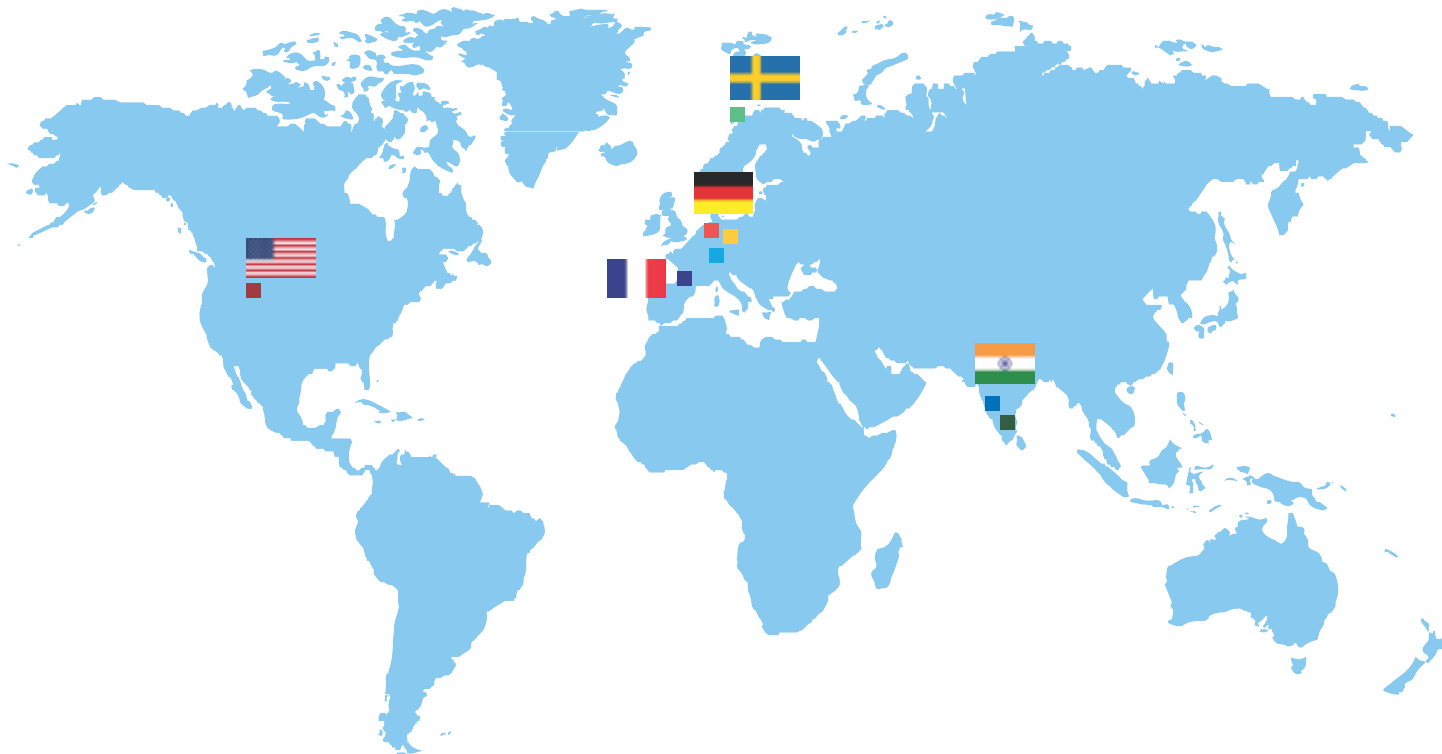


Metal Injection
Molding



R&D

BFL's Global Presence



TOTAL CAPACITY: 650,000 TPA

■ BF PMT Technologie LLC
Steel Forging, Light Weighting,
Al Forging*, Machining*

■ Bharat Forge CDP GmbH
Forging & Specialty Machining

■ Bharat Forge Daun
Forging & Specialty Machining

■ Bharat Forge AluminumTechnik
Aluminum Forging

■ Bharat Forge Aluminum, USA

■ Mecanique Generale Langroise
Specialty Machining

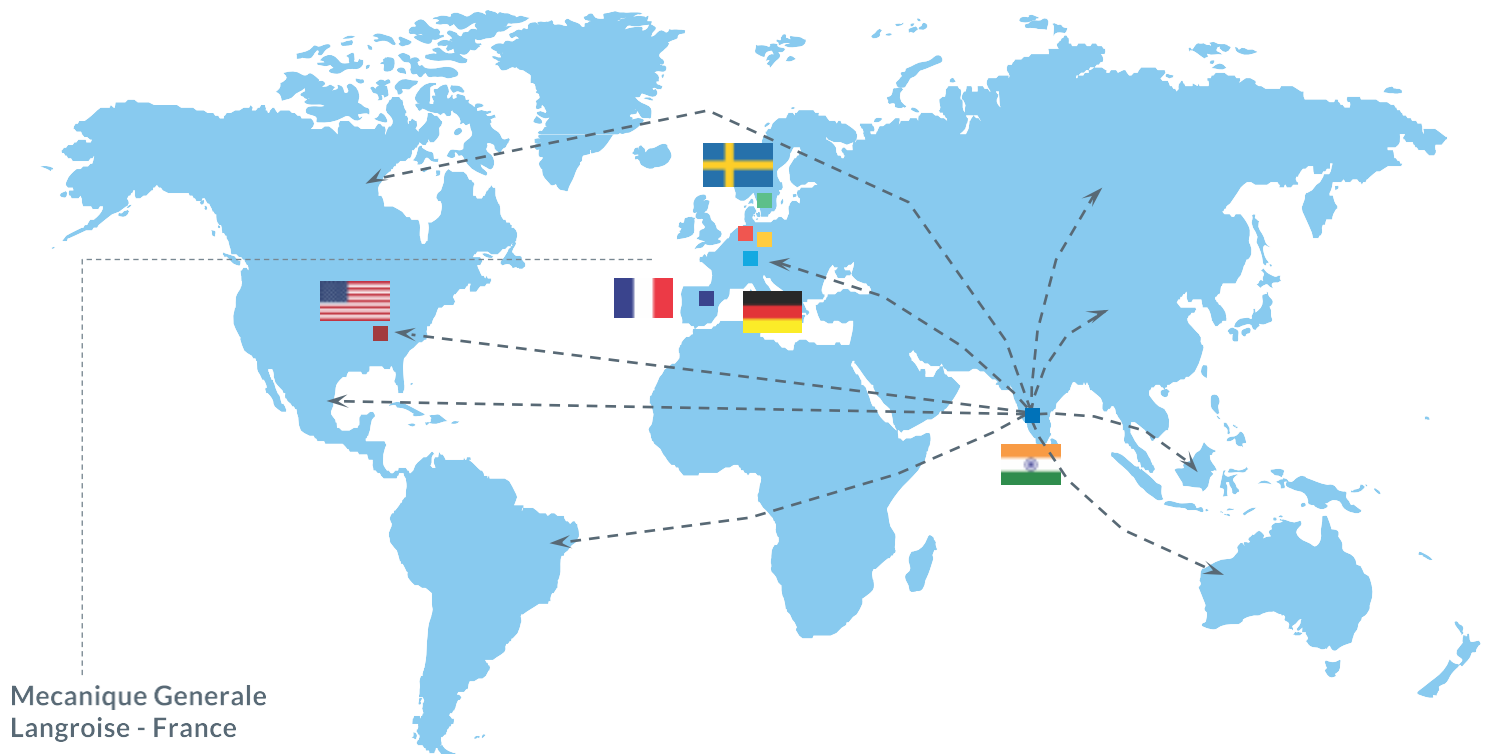
■ Bharat Forge Kilsta
Forging

■ Global Headquarter
Forging, Machining Innovation Center Fab & Assembly

■ Centre for Lightweighting Technology
Al/Mg Die Castings, Hydroforming, Carbon fibre

**Planned in future*

TOTAL CAPACITY:
STEEL : 620,000 TPA
ALUMINUM : 30,000 TPA



Mecanique Generale
Langroise - France

**BF PMT Technologie
LLC - TN & NC**

- ◆ 190 Employees
- ◆ **Steel Forging**
- ◆ **Product range** - upto 50 Kg
- ◆ **Sector** : Truck, SUV, Construction, Agri,
- ◆ **Aluminum** : High-volume Automotive Forging
- ◆ **Machining** : Contract Precision machining (Transmission, Driveline & Engine components)

Bharat Forge Aluminum, USA

**BF CDP GmbH -
Ennepetal & Daun**

- ◆ 530 Employees
- ◆ Forging & Specialty Machining
- ◆ **Product range** : upto 60 Kg
- ◆ **Sector** : Truck, Pass car, Construction & Mining, Railways

**BF AluminumTechnik -
Brand Erbsdorf**


- ◆ 280 Employees
- ◆ Aluminum Forging
- ◆ **Product range** : 1 - 7 Kg
- ◆ **Sector** : Pass car, Light Truck, Motorcycle

BF Kilsta - Sweden

- ◆ 320 Employees
- ◆ Steel Forging
- ◆ **Product range** : upto 350 Kg
- ◆ **Sector** : Truck, Construction Equipment

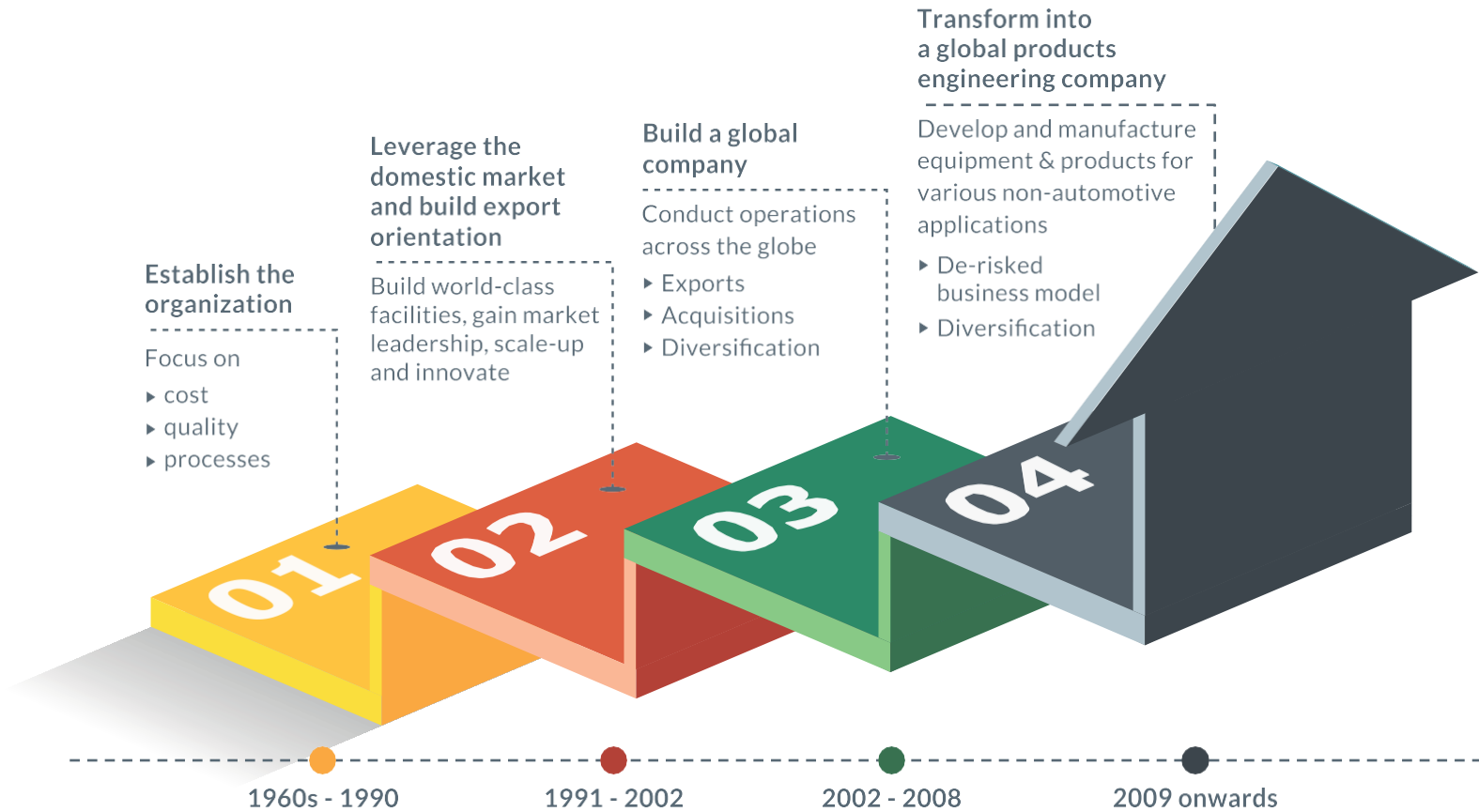
Global Headquarters- Pune, India

- ◆ 4800 Employees
- ◆ Forging, Machining, Innovation Center, Testing & Validation, Fabrication & Assembly
- ◆ **Product range** : 1 - 50,000 Kg
- ◆ **Sector** : Truck, Pass car, Construction & Mining, Locomotive, Aerospace, Oil & Gas, Agri , Power




OUR
STEP-BY-STEP,
PLANNED
APPROACH
HELPS
YOU PROGRESS!

Approach to building the business...

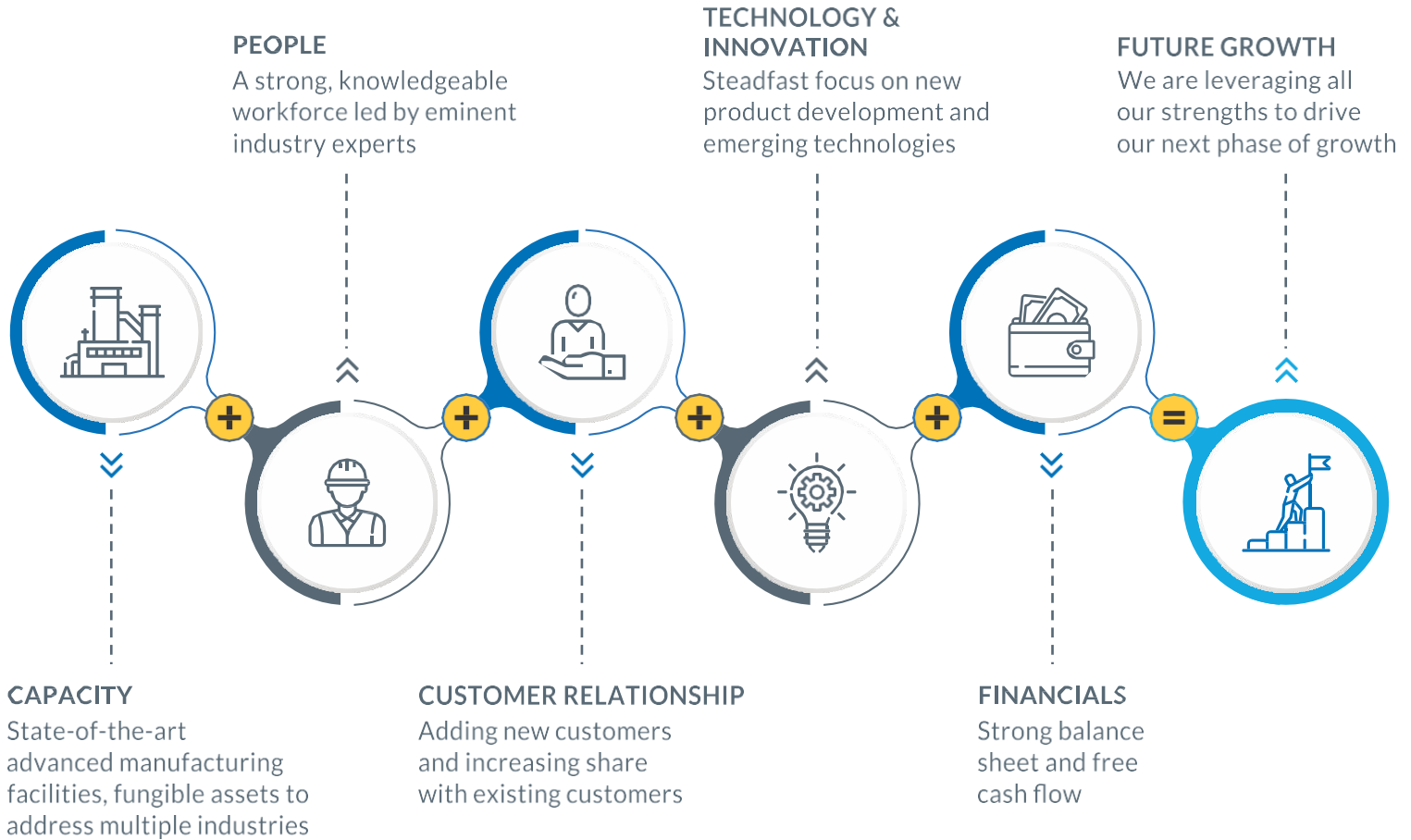






WEAREBEST
KNOWN FOR 3 A'S -
AGILITY, ACCURACY
AND THEART OF
MANUFACTURING!

Faster, smarter and future-ready



A snapshot of our facilities





**SUPERCHARGE
YOUR FUTURE**

BFL - Design and Manufacturing Infrastructure

We deliver end-to-end Design & Development solutions for our products. The concept-design, detailed-design, project analysis, project lifecycle assessment, life-extension and multi-disciplinary optimization for a wide range of systems and components from electro-mechanical, electro-hydraulic, and electro-pneumatic systems, etc., is effectively incorporated by our highly proficient workforce and management.

Global connectivity: There is full integration of the engineering centres of all BFL group plants worldwide, with global connectivity and exchange of best practices as follows:

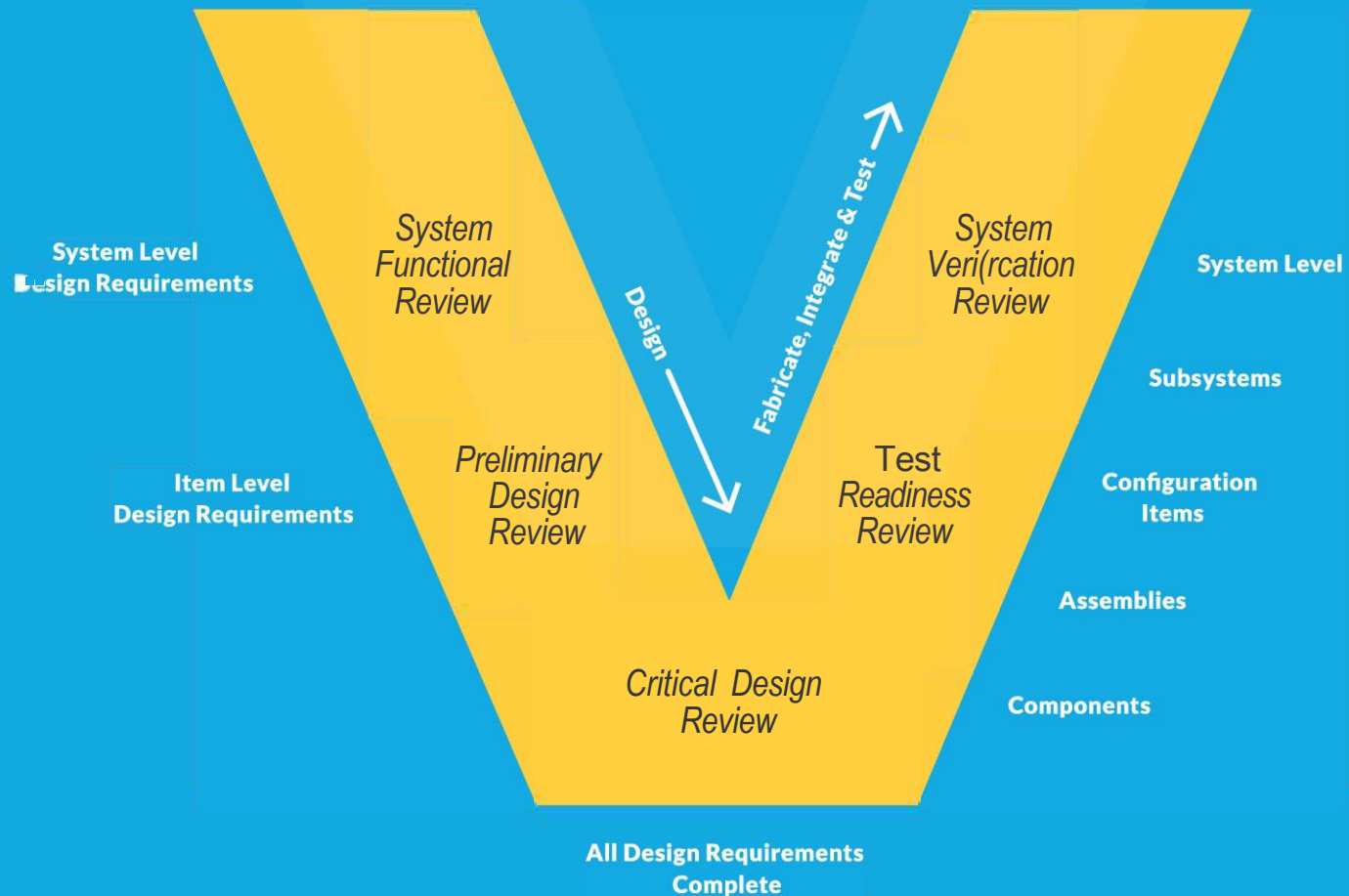
1. System level design: Systems design requires cross disciplinary domains and their emphatic integration. BFL and its sister companies have a rich pool of prominent expertise in systems design and integration in all verticals.

BFL strictly follows a *V-Model approach* for the development of various systems, which are designed to simplify the understanding of the complexity associated with developing systems. Our specialization in developing new systems can easily be noticed, by our core strength in mechanical simulation, system simulation, tooling and fixture design, etc.

2. Component level design: This includes but is not limited to...

- Forgings
- Fabrication
- Plastics & Composites
- Hydraulic & Pneumatic System design
- Virtual manufacturing

We deliver end-to-end Design & Development solutions for our products using the V Model approach.



Accelerating Change Across Industry Verticals

With the largest collective repository of metallurgical know-how, design & engineering expertise, supported by global manufacturing prowess, we offer full service supply capabilities to our geographically dispersed marquee customers—from concept to product design, engineering, manufacturing, testing & validation.

INDUSTRIES WE SERVE...

Automotive



CV

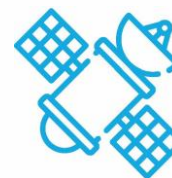
Industrial



Oil&Gas



Power



Space



Marine



PV



Construction&Mining



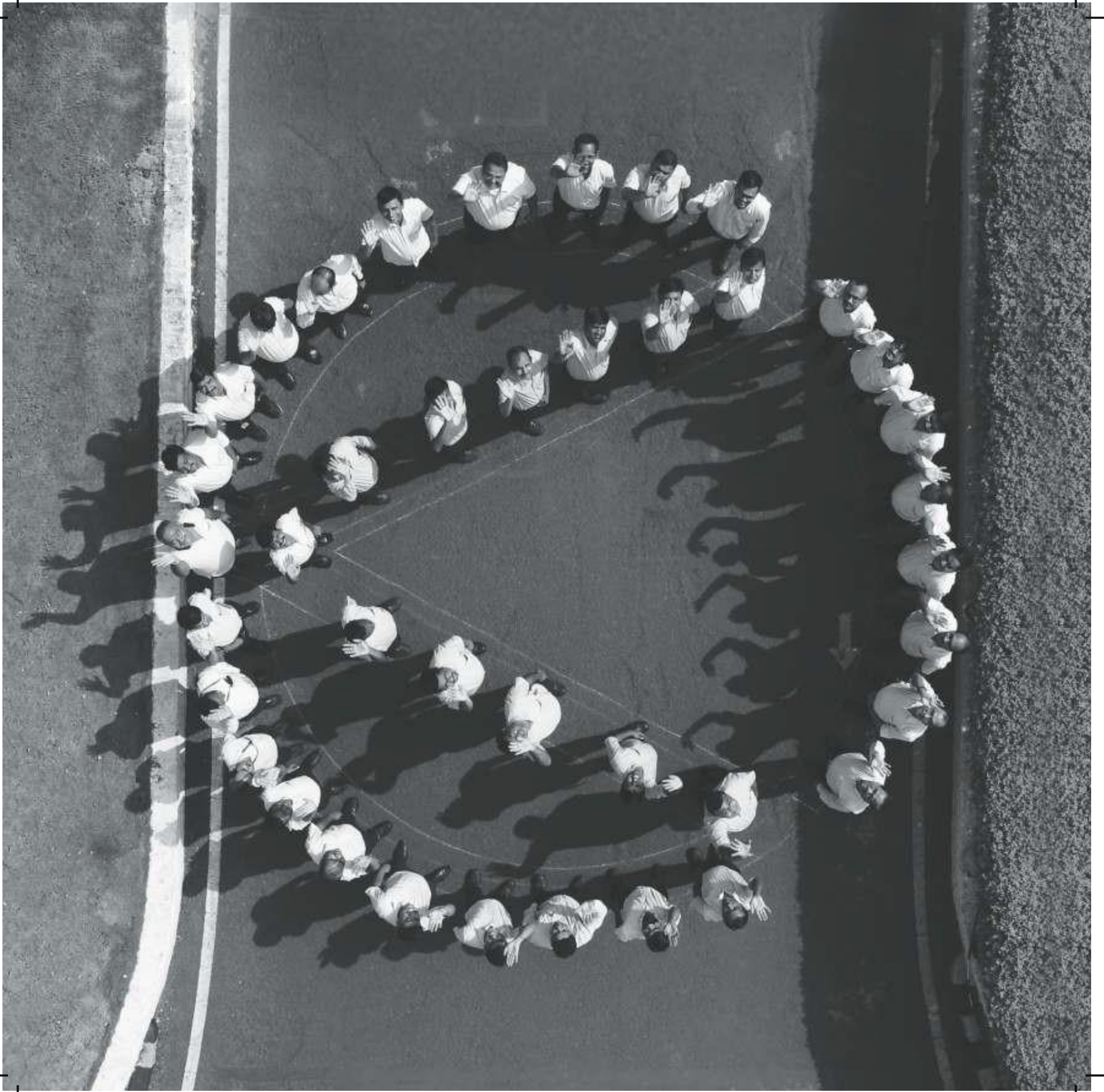
Railways



Agriculture



Aerospace





**OUR PEOPLE
THE DRIVING
FORCE OF
OUR SUCCESS**

Forging a talent factory to become future-ready!

Any organization stands firmly on the foundation their workforce creates. We are no exception to that! We believe in continuously honing the skills of our workforce, under the guidance of our highly skilled expertise. The manpower at the Kalyani Group have been the splendid strength of the past and the present and our current organizational culture ensures that they continue to remain the key to our future success as well!

SKILL UPGRADATION



BITS Pilani
700+ Graduates
Since 2001

UNDER GRADUATE STUDIES



IIT Bombay
200+ Post Grads
Since 2007

POST GRADUATE STUDIES



MANAGEMENT DEVELOPMENT



Warwick University

- Developing Future Business Leaders
- 25+ Graduates every year

POST GRADUATE STUDIES



TECHNOLOGY DEVELOPMENT



TECHNOLOGY SPECIFIC PROGRAMS



Materials | Processes | Advanced Products
Manufacturing

ADVANCED TECHNICAL SKILLS

INDUSTRY 4.0



ACCELERATED TRAINING PROGRAMS

- Hydraulics
- Pneumatics
- Sensor Technology
- PLC & Control Wiring
- AR & VR
- Human Machine Interface
- IOT
- Mechatronics
- Big Data Analytics

At any given point of time, 10% of our employee group are under intensive academic or training programs

A firm grip on the future

Honing digitization and industry 4.0 skills

Our transition to Industry 4.0 and Digitalization is fully equipped with facilitating infrastructure and ingeniously designed courses.

IN-HOUSE LABS



Industry 4.0 Lab, Mundhwa

- 6 Modules & 3 Levels covering Hydraulics, Mechatronics, Automation expertise using PLC & AI
- 384 hours of contact program for 60 employees in batches of 3



Digitalization Labs, KCMI, Pune and Baramati

- 6 Modules & 3 Levels covering Mechanical fundamentals and CNC Programming
- 384 hours of contact program for 60 employees in batches of 3

EXTERNAL INSTITUTES



IGTR, Aurangabad

- 11 modules on Production Technology, Mechanical Drawing, Mechatronics and CNC Programming
- 200 hours of contact program; 150 employees trained so far



GTTI, Coimbatore

- 5 modules on Mechanical fundamentals and CNC, CAD/CAM
- 288 hours of contact program, 60 employees have been enrolled





SUPERCHARGE
YOUR GROWTH
WITH OUR
ADVANCED
CAPABILITIES

Scripting our client's success with our flawless service delivery and enhanced manufacturing capabilities

Our strength of being vertically integrated with end-to-end capabilities from Steel to Finished Components & Aggregates, driven by rapid technology innovation helps us deliver amplified value to our customers. Our capacities and capabilities developed over the years in our state-of-the-art facilities offer our customers the advantage of meeting growing demands with optimized production.



TYPE	NUMBER
BFWSizing	03 Machines
HSM Section	40 Machines
CNC	18 Machines
EDM	05 Machines
Polishing	17 Stations



3Axis VMC



4 Axis HMC



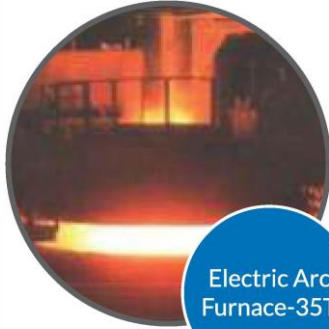
4 Axis HMC



3.5 Axis HMC with 1 deg indexing pallet

Steel Making and Open Die Forging

STEEL MAKING: SAARLOHA Advanced Materials Pvt. Ltd.
(Formerly-Kalyani Carpenter Special Steels Ltd.) : Kalyani Group Company



Electric Arc
Furnace-35T



ESR-
Dia. 810mm,
20T



VAR-
Dia. 800mm,
20T

- ISRO approved steel mill - Also approved by various customers across the world
- Ingot Casting upto 70 T weight, Blooming & Rolling mills, Finishing facilities
- Present annual capacity: 180,000 MT of Liquid Metal
- Regular producer of Carbon steel, low and high alloy steels, Stainless steels, etc.

OPEN DIE FORGING



1600T Press



4000T Press



Vertical Heat
Treatment
(30T)

- Regular supplier of convergent-divergent forgings to VSSC, ISRO
- Export of critical components to Oil & Gas industry across the world
- Capacity to forge ingots upto 45T weight
- Equipped with horizontal and vertical heat treatment facilities

Closed Die Forging and Ring Rolling

CLOSE DIE FORGING FACILITIES



16000T Press



12500T Press



80MT
C/B Hammer



EUMUKO
10000 T



KURIMOTO-
5500 T



AJAX 6000T

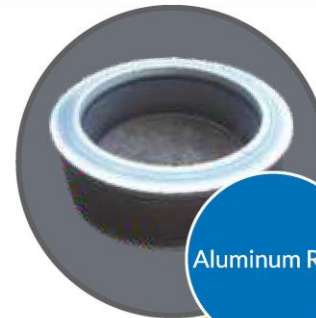
RING ROLLING FACILITIES



4000T
Hyd. Press



Ring Rolling
160/125 RAW



Aluminum Ring

- Supply to all major OEMs globally
- Capacity: Upto Dia. 3m and 500mm height
- Supplier of rings of 15CDV6 to ISRO and Aluminum alloy to Defence

Machining

MACHINING FACILITIES



- Heavy Duty Lathes, CNC Lathes upto 2m dia. and 16m length
- VTL's upto 3m dia. Capacity
- Deep Hole Drilling Machines upto 8m length capacity
- Horizontal Boring machines upto 25T weight capacity
- Vertical Milling Centers upto 8T capacity
- 5 axis CNC machines
- Gear manufacturing machines
- Others- Plano-millers



Gear Manufacturing Machine- Accuracy of DIN7/8



Gear Hobbing Machine



Struder OD and bore grinder

PRODUCTS TO THERMAL, HYDRO, NUCLEAR POWER, OIL & GAS, ETC.



Precision Machining and Heat Treatment

AEROSPACE AND PRECISION MACHINING AND HEAT TREATMENT FACILITIES



Blade Machining with Adaptive Software

- End-to-end manufacturing capability for Blade manufacturing (Forging+ Heat Treatment+ Machining)
- End-to-end manufacturing capability for turbocharger including assembly and testing



Aerospace and Turbocharger Manufacturing

► Jet Engine (Forging, Machining and Testing)

- Blades
- Discs and Shafts
- Gears
- Casings & Housings

► Aircraft Structural Components

- Titanium Forgings and Machining

► Under carriage - Landing Gear (Forging, Machining, Assembly and Testing)

- FixedWing
- RotaryWing

► Transmission Systems- Rotary Wing

► Jet Engine Manufacturing- Micro Turbine Engines (In progress)

- Design, Mfg, Assembly and Testing



B 8 E J



Dia. 430mm Compressor Impeller
Mtrl: Aluminium Alloy



Dia.170mm-Blisk for gas turbine
Mtrl: Inconel Alloy



Dia. 93mm Compressor Impeller
Mtrl: Aluminium Alloy



Dia.170mm Compressor Impeller
Mtrl: Titanium Alloy



Blades: Weight: 5to25kgs.
Mtrl: Ti alloys



Landing Gear Components- 50kg to
300kgs. Mtrl: Steel



Shafts and Discs- 50kg to350kgs
Mtrl: Titanium/Inconel/Steel/Udimet/EP7421D



Aero Structures: 50kg
to250kgs
Mtrl: Titanium

Heat Treatment Facilities



- Job weight max. : 30T
- Job dimensions : $\phi 1200 \times 12000$ MM Length
- Furnace Temp. max. : 1150°C, Electric Coil Heating Type
- Temp. uniformity : $\pm 7^\circ\text{C}$ at 650°C; $\pm 5^\circ\text{C}$ at 950°C
- Quenching Media : Water and Oil

- Hardening And Tempering
- Vacuum Hardening
- Vacuum Annealing
- Plasma Ion Nitriding
- Vacuum Brazing
- Gas Carburizing
- Carbonitriding
- Nitrocarburising
- Nitrocarburising With Post Oxidation
- Gas Nitriding
- Shot Blasting
- Sand Blasting



Metal Injection Moulding Facility



- | Setting benchmarks for the industry
- | Pioneer in India for catalytic de-binding furnace
- | Latest machines and robotics undertake Moulding, Sintering and De-binding
- | Catering to a wide range of products from 10 mg to 320 gms

Characteristic	Minimum	Maximum	Optimum
Mass	0.01 g	250 g	<50 g
Wall Thickness	0.125 mm	7.62 mm	2.03 mm
Dimensions Annual	0.3 mm	200 mm	50 mm
Usage	25,000	Millions	> 100,000

*Density>97%, Tolerance: +/-0.5% of base dimension, Surface finish : 0.6-1.6 Ra



| Fully Equipped Laboratory

| Embedded Software Development

| PCB Design Expertise

| Testing Facilities

Additive Manufacturing (3D printing)

Being one of the most progressive and leading manufacturing giants across the globe, the Kalyani Group owns the largest additive manufacturing infrastructure in India. Additive manufacturing (3D printing) is a revolutionary and path-breaking shift in manufacturing technology, which has created ripples across the world and has changed the way the world manufactures. The ultra-modern EOS M290 machine we use, has a building capacity of 250 mm x 250 mm x 300 mm and uses various metal powders such as SS316L (Stainless Steel), Inconel 718, Ti6Al4V (Titanium), AlSi10Mg (Aluminium alloy), other low alloy steels, etc.



Building Volume : 250 X 250 X 325 mm³

Build Speed (cm³ / hr.) - 13.50 - 20

Laser Type - Fiber laser 400 W

Materials - Stainless Steel, Titanium Ti64, Nickel Alloys

Aluminum AlSi10Mg, Maraging Steel, cobalt chrome, etc.



Industrial Application



Hub



Piston Top



Impellor



Turbine Blade



Piston Crown



Defense Application

One Stop Shop for EV and Related Products

LANHICHE

SEGMENT

LIGHTWEIGHTING

Al/Mg structural parts, motor/
battery cover, engine brackets, etc.



ALUMINIUM
FORGINGS

Knuckles, front axle beams, etc.



TRANSMISSIONS

Shafts, gears, hybrid transmission
components - EV, AMT, DCT



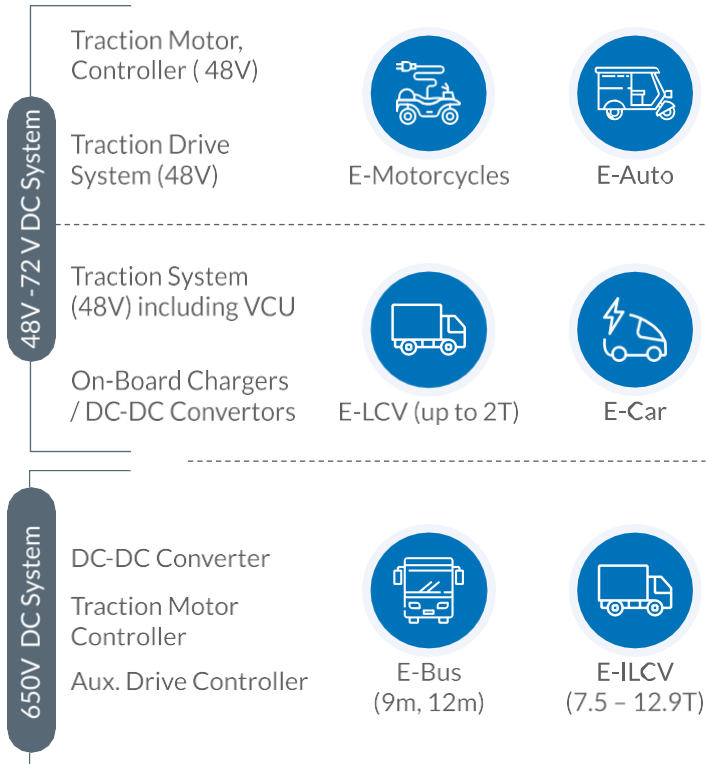
EV POWERTRAIN

E-Motors, Battery & BMS,
Controllers, Inverters, Converters

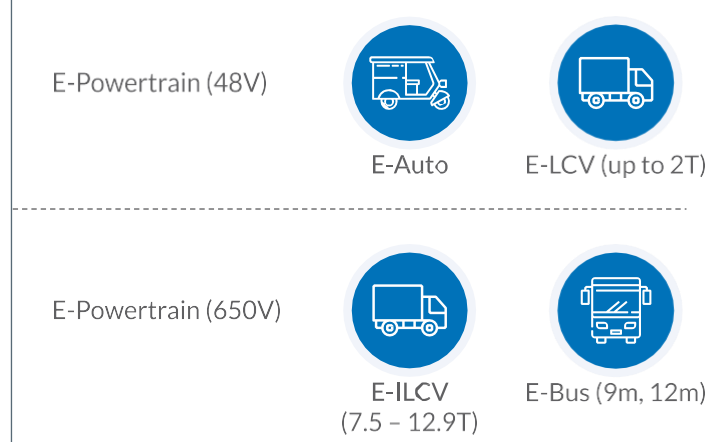


E-Mobility Product Applications

COMPONENTS & SUB-SYSTEMS

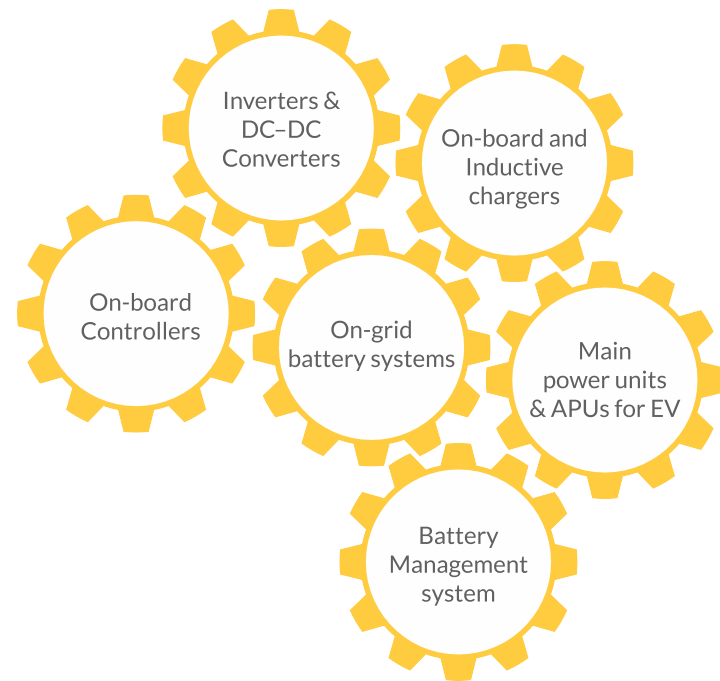


EV POWERTRAIN SOLUTION



BFL-REFU joint venture production in E-mobility

PRODUCT LINES



REPRESENTATIVE PRODUCTS



Center for Light Weighting Technologies (CLWT) - Light Weighting - Applications

LIGHT WEIGHTING ALUMINIUM & MAGNESIUM

Automotive Applications



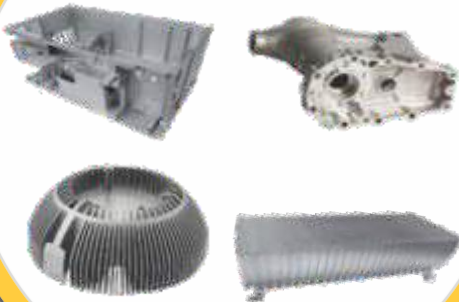
- High Technology Components
- Structural (2mm wall thickness)
- Squeeze & Vacuum Technology
- Sub-Assemblies

Future Market Applications



- Parts for EV & Structural body
- Hydro Forming parts
- Highly Critical Parts with LPDC, GDC Process

Industrial Applications



- High Technology Components
- Complex & Critical parts
- High strength Components

Center for Light Weighting Technologies (CLWT) - Innovative Solutions



Light Weighting
HPDC / GDC / LPDC



NOX Technology
Vacuum Casting



Jet Cooling



Alloy Welding
properties



Mg Castings



Micro Machining



In house R&D



Industry 4.0

Dedicated to strive hard and explore innovative concepts for progressive transformation

Center for Light Weighting Technologies (CLWT) - Al & Mg Die Casting Machines

700T

(0.75 Kg to 1.5 Kg)

Covers, Bearing Housing, Small
Oil Pump Housings

2200T

(10 Kg to 12 Kg)

Instrumental Panel, Powertrain
Drive, Shock Tower, "A,B,C" Pillars

900T

(2.5 Kg to 3 Kg)

Medium range Covers,
Housing

2650T

(13 Kg to 15.5 Kg)

Powertrain Drive, Engine Block,
Door Frame, Shock Tower,
"A,B,C" Pillars

1100T

(3 Kg to 5.5 Kg)

Gear Box & Clutch Housing,
Covers, Steering wheel

3200T

(17 Kg to 20 Kg)

Rear Grill, Door Frame,
Powertrain Drive, Rear Door,
Shock Tower, "A,B,C" Pillars

1900T

(4.5 Kg to 15 Kg)

Housings, Covers, Oil Pan,
Bed Plate, Structural parts

4200T

(15 Kg to 30 Kg)

Tail Gate, Instrumental Panel,
Battery & Other Housing,
"A,B,C" Pillars



Transmission Strategy

CAPABILITY BUILD-UP



World class technology & facilities



Advance Gear lab facilities



NVH focused capabilities

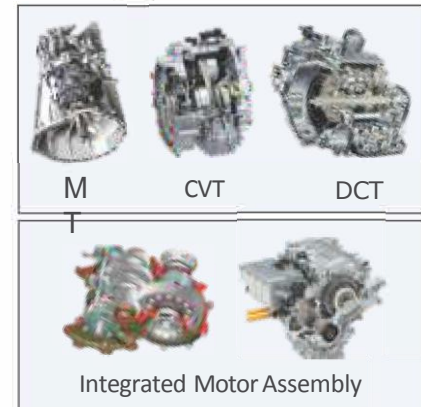
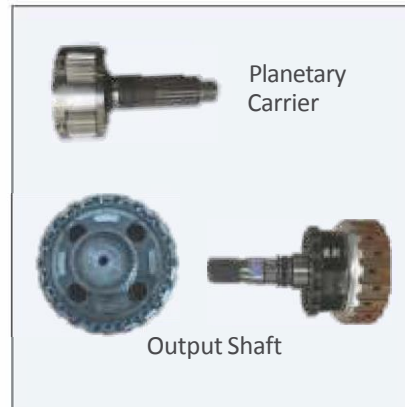
2018
Components

2019
Sub-Systems

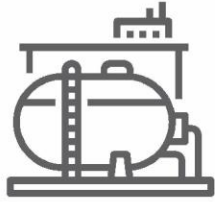
2022
Systems

IC Engines

Electric Vehicles



Industrial



OIL&GAS

| Subsea | Drilling &
Shale
| Surface



POWER GEN

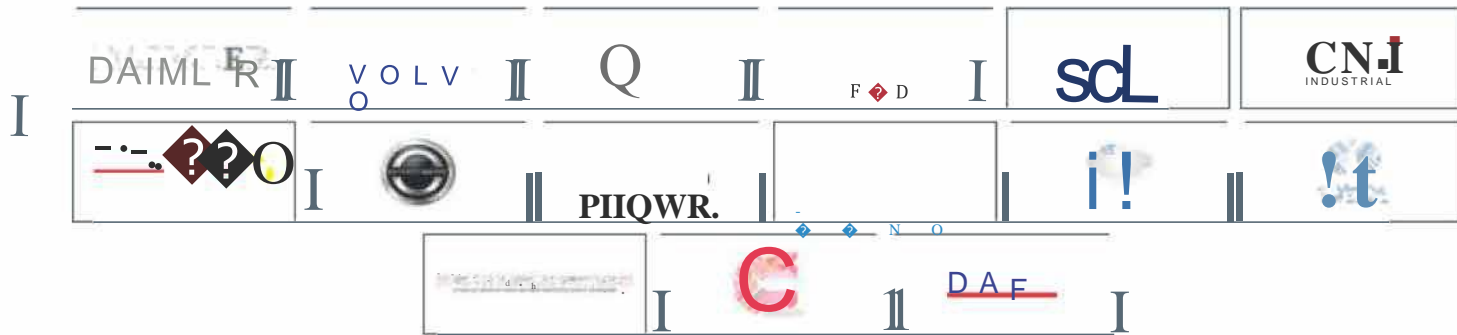
| Hydro | Wind
| Thermal |
Nuclear



TRANSPORTATION

| Railways | Marine
| Aerospace

Clientele from Automotive Industry | Every global automotive OEM and Tier 1 supplier



CARS



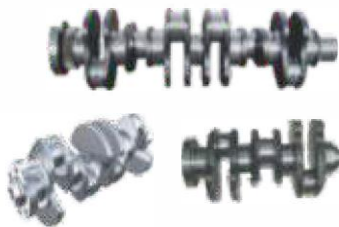
OTHERS



Product overview : Automotive

ENGINE

E



Crankshaft



Connecting Rod



Emission/
After Treatment



Fuel Injection
System



Stator Carrier



Rotor Carrier



Impeller



VGT
Nozzle Ring



Piston for PV and CV



Camshaft

CHASSIS



Front Axle Beams



Steering Knuckle



Steering Arms and
Suspension arms



Reinforcement
Bracket



Tie Rod



Control Arms



Knuckle



Control Arm



Fork

Product overview : Automotive

TRANSMISSION



Input shaft



Input shaft



Synchro Rings



Main shaft & Counter shaft



Cylindrical Gear

DRIVELINE



Conventional & Near Net forged Crown Wheel Gears



Precision forged Differential Gears with Near Net form Teeth



Tandem Axle Components



Axle shafts



Yokes



Spindle

Industrial Clientele - Global Leaders Across Industries

MARINE POWER G



RAIL & CONST



OIL & GAS



AERO



ENERGY



DEFENCE



Product Overview | Industrial | Oil and Gas

FLOW CONTROL & VALVES



Venturi



Machined GVB



Forged GVB



Shell



GVB Blanking Press



Bonnet

SUBSEA



Spool Body



Ring



Mandrel



Connectors

DRILLING



Top Drive - Spindle



Double BOP



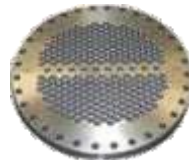
Quintplex FE

Product Overview | Industrial | Power Generation

THERMAL



Proof Machined Rotor



Tube Sheet



Steam Turbine Blade



Forged Nozzle

HYDRO



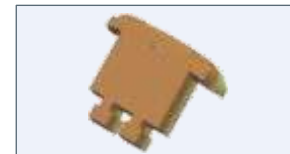
Fully Machined Rotor



Thrust Block



Trunion



Pole End Plate

WIND



Ring Wheel



Fast Wheel



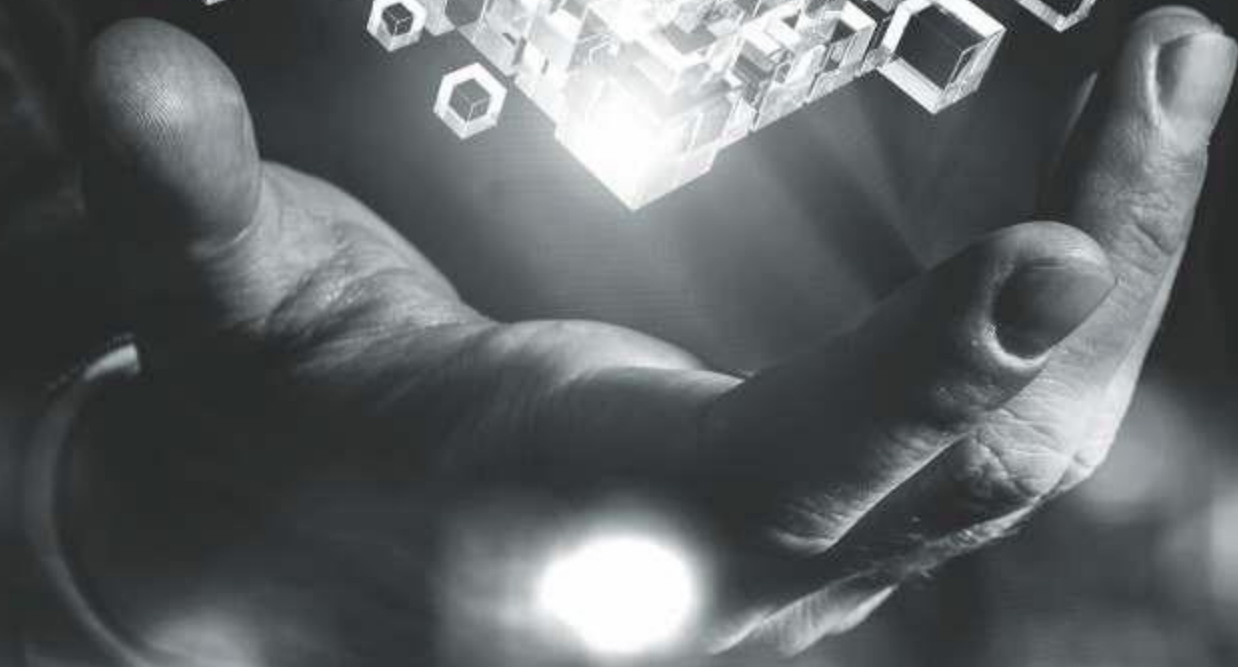
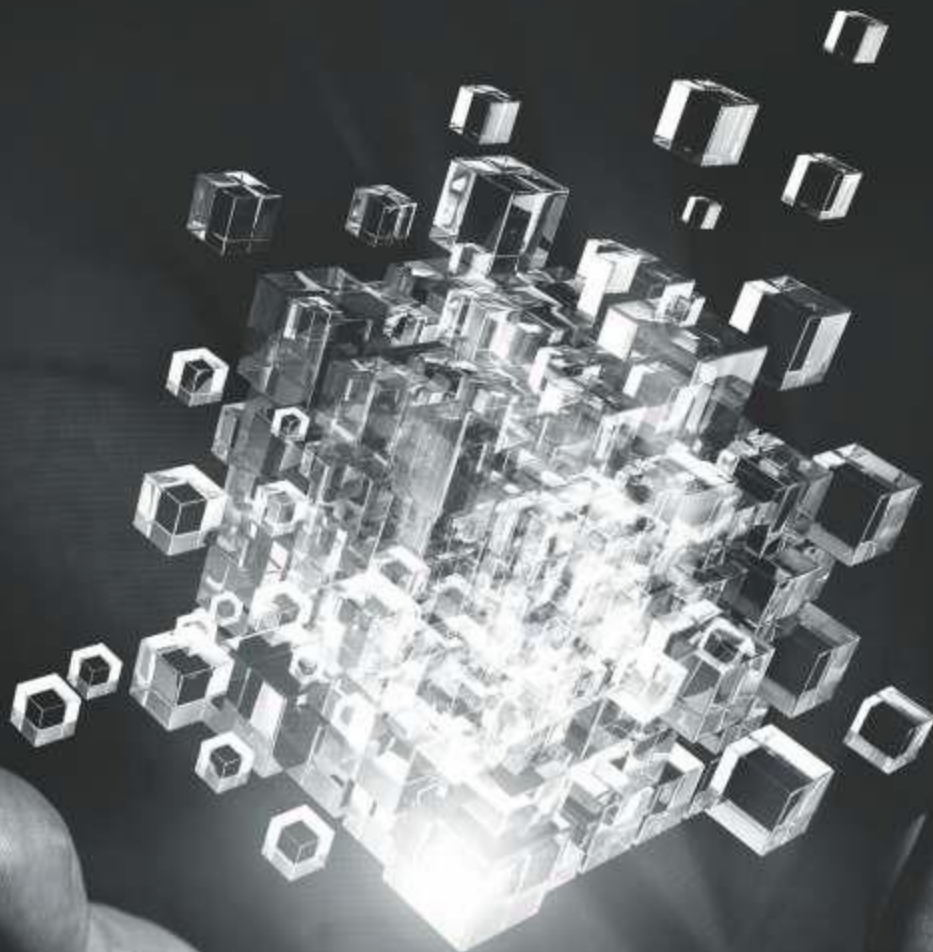
Slow Wheel



Planet Wheel



Hollow shaft



**TECHNOLOGY-
DRIVEN
COLLABORATIONS
FOR A BETTER
TOMORROW!**

Nurturing change mechanisms of the future

As far as the current technological trends are concerned, all Agile organizations in all industrial sectors across the globe are busy in consistently building the future, by investing hefty amounts in technology and innovation that can bring a revolutionary transformation. We, at the Kalyani Group, don't simply rely on our stable foundation and constantly drive agility by building a better tomorrow! Our prolific R&D centres, viz., Kalyani Centre for Technology and Innovation (KCTI) and Kalyani Centre for Manufacturing Innovation (KCMi) stand testament to our vision to outdo the future.

RESEARCH & DEVELOPMENT CENTRES



Kalyani Centre for Technology and Innovation

- Optimization of steel and forging process through advanced labs of Heat Treatment, Metallography, Fatigue, Creep Testing
- Nano Technology, Battery Technology & Electronic Labs



Kalyani Centre for Manufacturing Innovation

- Joint Engineering support during product development
- Speedy Development of "Pt and "B" samples
- Establishing design for manufacture processes and technology

KCTI - At the heart of technology-driven strategy

Leveraging global reach to develop in-house organic capabilities

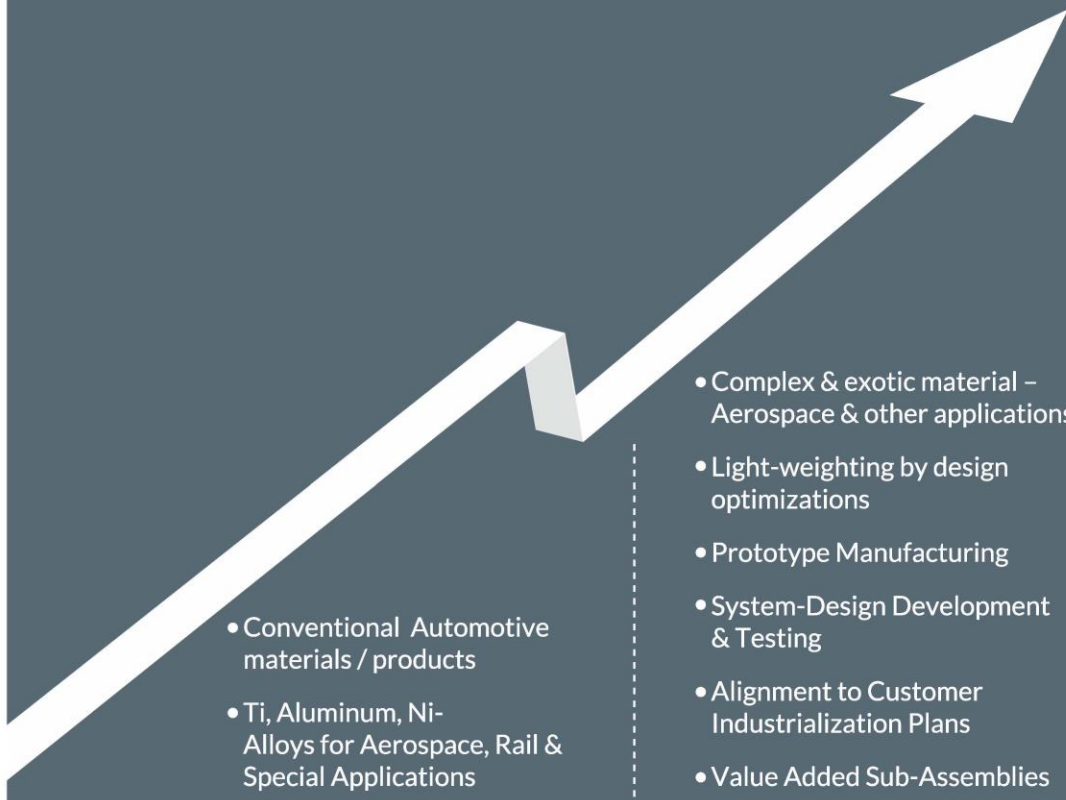


- | Rich Metallurgical Repository
- | **200+** Researchers
- | **50+** patents filed
- | Prototype shop for the world offering EV solutions across US, Europe, Asia

■ Academic Excellence
 ■ Institutional Research
 ■ Innovation Centers

Thinking technology, that's ahead of its time!

Engineering solutions for tomorrow's problems



- Conventional Automotive materials / products
- Ti, Aluminum, Ni-Alloys for Aerospace, Rail & Special Applications

- Complex & exotic material – Aerospace & other applications
- Light-weighting by design optimizations
- Prototype Manufacturing
- System-Design Development & Testing
- Alignment to Customer Industrialization Plans
- Value Added Sub-Assemblies

- New Materials Research/ Development
- Transmission & Driveline Components
- Advanced Manufacturing
 - 3D Printing in Metals
 - Metal Injection Moulding
 - Electron Beam Processing
 - Laser Processing
- Digital Manufacturing
- Precision Machining
- Nano Technology
- Metal Matrix Composites
- Surface Coating Techniques
- Power Electronics and Drive Systems
- Embedded Systems & Controls
- Jet Propulsion Technology

Material

Y1996-2012

Process

Y2012-2017

New Products & New Technologies

Y2017 ONWARDS



Metal 3D Printing



Carbon Fiber 3D Printing



Advanced Gear Manufacturing

R&D: Competencies at KCTI

Metal Processing	<ul style="list-style-type: none"> • Metal Processing • Nano Technology
Material Analysis	<ul style="list-style-type: none"> • Metallography • Optical Microscopy • SEM - EDS, EBSD
Material Testing	<ul style="list-style-type: none"> • Fatigue Testing • Creep Testing • Fracture Mechanics
Advanced Manufacturing	<ul style="list-style-type: none"> • Electron Beam Welding • Component Manufacturing from Solid Block/ Billet • 3D Printing • Laser Welding
Virtual Manufacturing	<ul style="list-style-type: none"> • Product Design • Process Simulation • FE Analysis
Battery Lab	<ul style="list-style-type: none"> • Life Cycle Testing • Cranking & Capacity Testing
Advanced Library	<ul style="list-style-type: none"> • Technical Books, Proceedings • International Journals • International Standards



3D Printing:
Metal



3D Printing
Plastic &
Carbon Fibre



Virtual
Manufacturing

Testing Facilities



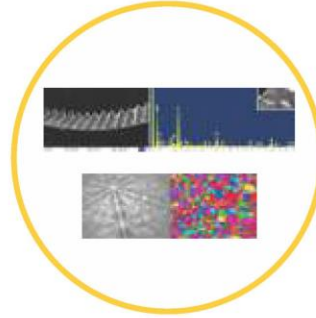
Metallography Lab



Optical Microscopy



Scanning Electron Microscopy (SEM)



Creep Testing



Fatigue Testing



Material Testing

Competencies at KCM I

Engineering Capabilities

- Process Engineering
 - Co-engineering for DFM for A and B Samples
 - Analysis

Metrology Capabilities

- Gear Tester Klingelnberg P -100
- CMM Zeiss Accura
- Surface Roughness and Contour Measurement
- Optical Measurement O Inspect
- Hardness Tester Zwick

Manufacturing Capabilities

- Turning
- Hobbing Liebherr
- Shaping Liebherr
- Machining Centre DMG
- Un-iversal Grinding Studer
- Surface Grinder Kent
- Gear Teeth Grinding Kapp Niles
- Metal Injection Molding Set -up

Software Capabilities

- Creo 3.0
- AutoCAD Mechanical
- Hypermill



DMG 5 Axis 125 FD



Kapp Niles - ZD 800



GRD Grinding Studer



Hobbing-Liebherr

Prototype Machining & Inspection Facilities

CUTTING-EDGE NEAR NET PROTOTYPING TO ENABLE FAST-PACED DELIVERY TO OUR CLIENT



Turning



5 Axis Milling



Gear Hobbing



Gear Shaping



Surface Grinding



Profile Grinding

Prototype Machining & Inspection Facilities

CUTTING-EDGE NEAR NET PROTOTYPING TO ENABLE FAST-PACED DELIVERY TO OUR CLIENT



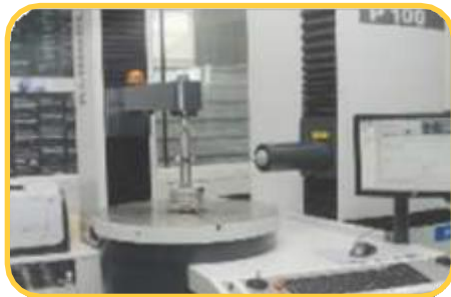
ID & OD Grinding



Part Cleaning



CMM



P 100 Gear Tester



O-Inspect



Surface-Contour Tester

Case Studies

Highlighting a better future

In the global fight against the COVID-19 pandemic, the Kalyani Group has developed two critical care ventilators, which are saving thousands of lives globally.

CRITICAL CARE VENTILATORS DEVELOPED BY THE KALYANI GROUP

Our Fight Against Covid-19 : Ventilators



Pufferfish – an ICU Ventilator



VITAL – a pre-ICU Ventilator



“Global Efforts for a Global Problem”

A sophisticated ICU ventilator has been developed by the Kalyani Group, in collaboration with a Research Consortium based in the US and Industry partners like Blackrock and Waymo.

VITAL – a pre-ICU ventilator developed by Jet Propulsion Lab [JPL], NASA has been officially licensed to the Kalyani Group for production and distribution.

The NEXT of start ups

Over the last decade, tech start-ups have led to the far-reaching changes in digitization and innovation. Keeping an eye on all these movements, the Kalyani Group is nurturing and leveraging start-ups in India and continues to utilize the most ignited minds in the country for the betterment of society and for sculpting a better tomorrow!



Inertial Navigation Systems and Industrial IoT

Aeron offers a wide range of tech-driven products and solutions under Inertial Sensing and IIoT verticals using MEMS and Inertial Systems



Natural Language Processing

Data Science in Applying Machine Learning to Human Learning with specific focus in building solutions for Defence and Homeland security operational since the last 7 years



High Performance Composites

Eternus Performance Materials is engaged in high-end research, design and manufacturing of Advanced Composite materials



eTrucks and Powertrains

Tevva offers Pure EV and Range extended trucks and powertrains for LCV, MCV and HCV segments



Advanced AI Applications

They simplify AI implementation to transform businesses with advanced Vision Intelligence with end-to-end solutions



Electric 2W, 3W Powertrain

India's first performance Electric bike manufacturer, with technology based on 7 years of R&D

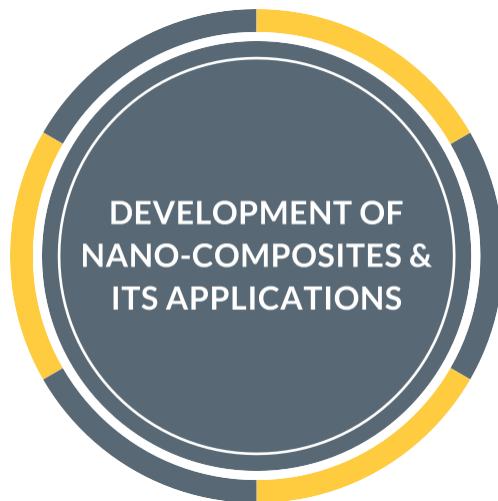


Ballistics Computing

They are a computer aided engineering design and analysis company which provides solutions to engineering problems in Fluid Mechanics, Materials, etc.



Nano technology



- NANO- LEAD ACID BATTERIES
- CATALYTIC CONVERTERS – BS IV and BS VI NORMS
- METAL MATRIX COMPOSITES – Al & Mg
- NANO- LUBRICANT FOR FORGING APPLICATION
- SURFACE COATING OF THE FORGING DIES
- METAL INJECTION MOULDING- FEEDSTOCK DEVELOPMENT
- HEALTH CARE PRODUCTS

Medical Implants – Kalyani Additives

Kalyani Additives under the roof of the Kalyani Group, has positioned itself as probably the only company in the world, which offers solutions to its Healthcare clientele for Forging, MIM & 3D printing with ISO-13485 certified processes.



FORGING

- Titanium
- HNSS
- SS316L



METAL INJECTION MOLDING

- Titanium
- SS420
- SS316LG+
- SS304



METAL 3D PRINTING - EBM

- Titanium
- CoCr.





**GLOBAL
RECOGNITION**

Certified to build a better tomorrow!

Awards are the recognition of a happy and satisfied clientele. Our high client retention ratio is an indication that our clients gain maximum end-to-end value by ensuring that quality remains the same at the core of all its stages. Our products undergo strict quality checks at multiple instances before getting delivered to the client.

Our Certifications



CEMILAC Approved



Rolls-Royce SABRe



BFL Engg. Center
CMMI-Level 3



NADCAP approvals for Heat Treatment,
Chemical Processing & NDT



API 20 B Monogram

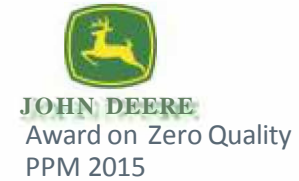


BMS?-247, D1-4426



LAB APPROVALS

Accolades



**BE FUTURE READY,
TODAY!**

Your sustainable partner for tomorrow.



KALYANI

Bharat Forge Limited, Mundhwa, Pune - 411 036, INDIA, Tel: + 91-20-67042777,
Email: info@bharatforge.com | Website: www.bharatforge.com, www.kalyanigroup.com