



1 Start the shape



2 Start the forge



3 Second the forge



4 Art the product



5 Shape the product



6 Strength the forge



7 Finish

2 Decades of  
**SHAPING THE  
STRENGTH**



**Pentagon**  
Forge & Machine Ltd.



**Kalaria**  
Forge Pvt. Ltd.

2 Decades of  
**SHAPING  
THE  
STRENGTH**

## FROM THE MANAGEMENT



**Ajay Kalaria**  
Managing Director

**Suresh Kalaria**  
Founder & CEO

Hello,

We are glad to state the fact that **Kalaria Group** is steadily and successfully scaling up in climb to the summit of ready to use or let's say in the sector of assembled machined forging. We genuinely believe in sustainable growth with firm foundation and our mission of providing what customer needs never gets changed. It has become possible for us through world class manufacturing facilities and systems, commitment to work, our professionally managed team and the kind cooperation of OEMs customers, their support, guidance and suggestions.

At **Kalaria Group**, we are always driven by our motto of '**SHAPING THE STRENGTH**'

### ***What do we mean by shaping ?***

*Shaping means all major operations are performed in-house like raw material testing, die designing and manufacturing, forging, heat treatment, shot blasting, crack detection and finish CNC machining.*

### ***By strength we mean that...***

*To build commitment in terms of delivery, quality, products at competitive price, on time delivery, international quality standards in process and design to follow, strong customer base, empowered employees and concern for our social responsibility.*

We have also diversified our business in various sectors like Automotive, Tractors & Farm Equipment, Infrastructure & Mining, Oil & gas industry, Construction Equipment Industry, Power industry, Industrial Forging Application.

Thank you.



## STATE OF THE ART INFRASTRUCTURE

Starts Operation in 2004, Spread in 50,000 Sq.ft & Built up area 34,000 Sq.ft



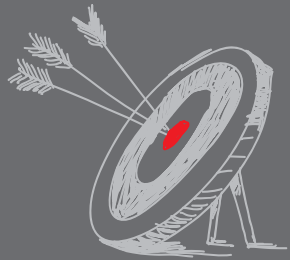
- In house Die design & Manufacturing.
- Well Equipped Metallurgical Lab. with Mechanical Test.
- Close Die & Upset Forging.
- Weight capacity- 0.5kg to 12kg & gathering Rod Dia. upto 40mm.
- In house Heat treatment, Shot blasting, Fettling & Crack detection facility.



Starts Operation in 2014, Spread in 3,50,000 Sq.ft & Built up area 2,60,000 Sq.ft

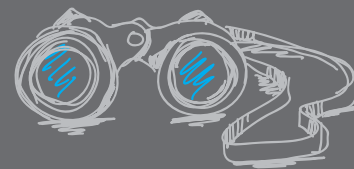


- In house Die design & Manufacturing.
- Pneumatic Forging Hammer(HUTA) - 2T, 3T, Belt drop hammer - 1T & Screw Press forging with induction billet Heater.
- Forged capacity- 0.5kg to 40kg
- In house continuous Heat treatment facility for Normalizing, Iso thermal Annealing & Harden-temper.
- In house Shot blasting, Fettling & Crack detection facility.
- Well equipped CNC turning, Facing-Centering & vertical machining centers with Rotary tilting table.
- In house Metrology Lab with Standard Room (full-fledged Inspection Testing Facility).



### OUR VISION

The Company Vision is to become the Best in the Industry with a Mission to provide what the Customer needs and even more in terms of Service through Focus on Exports & OEMs.



### OUR MISSION

To Adopt world class manufacturing facilities & Methods for meeting International Quality Standards to cater customer needs.



### OUR STRENGTH

- One stop solution to ready to use & assemble finish forging
- Zero defects ensured by In-house Forging, Heat Treatment & CNC Machining facility
- Forged weight capacity from 0.5kg to 40kg for Hammer & Press forging
- Rod Diameter gathering capacity up to 40 MM for Upset forging
- Annual production capacity 12000+ Per annum
- Sales over 18 Million+ USD
- On time delivery & service Mechanism
- Prompt Response by Professional and Experienced Team.
- Quality products at competitive price as per International Std.
- Fast Development & Flexibility in Planning.
- Most challenge and critical design can be made.
- Fully Integrated SAP available for Real-Time Traceability & Inventory.



# WORLD-CLASS CAPABILITIES



## MATERIAL AND GRADES

Low carbon steel	: SAE1018, SAE1020, EN1A, EN32B etc.
Medium carbon steel	: EN8, EN9, SAE1040, SAE1141, SAE1541, S43C etc.
Alloy steel	: 20MnCr5, SAE4140, SCM420, EN24, SAE4340, 42CrMo4, EN353, SAE8620, 40Cr4 etc.
Stainless steel	: SS202, SS410, SS304L, SS316L
Aluminum Alloy	: HE15, HE30, 2014, 6061, 7075 etc.

We can forge any kind of ferrous & Non-ferrous Metal as per Customer specifications.

Closed die forging size	: 650 # 350 # 250mm
Weight capacity	: 0.5kg to 40kg Single Piece



Raw Material Yard



Heat Treatment



Tool Manufacturing



Cutting



Forging



Shotblasting

## FORGING SHOP FACILITY

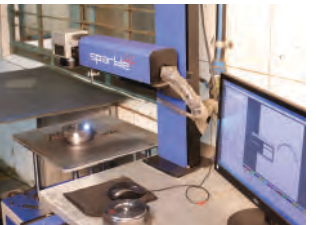
Equipment	Capacity	Description
Die Forging Hammer (650 KW Heater)	( Huta Zugmunt Mpm - 3t)	01 Line
Die Forging Hammer (350 KW Heater)	( Huta Zugmunt Mpm - 2t )	01 Line
Die Forging Hammer (300 KW Heater)	( Belt Drop- 2t)	01 Line
Die Forging Hammer (200 KW Heater)	( Belt Drop- 1t)	02 Line
Upset Forging (100 KW x 3 Heater)	Gathering Rod Dia. 40mm	01 Line
Screw Press Forging (200 KW Heater)	Weight upto 2kg.	01 Line
Continuous Type Furnace		
- Hardening - Tempering & ISO-Annealing.	Production Capacity 10T / Day.	01
- Continuous type Normalize Furnace	Production Capacity 15T / Day	01
Shotblasting	Production Capacity 1T / Batch	03



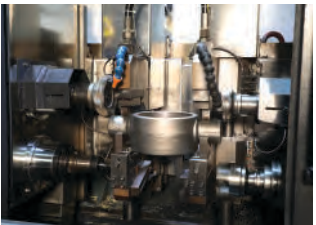
Air Compressor

## CNC MACHINING FACILITY

Equipment	Capacity	Description
CNC Turning Center	300 x 500	22 Nos.
CNC Turning Center	350 x 1000	02 Nos.
Polygon Turning Center	A/F upto 75mm	02 Nos.
Vertical Machining Center with Rotary Tilting	700 x 500 x 400	16 Nos.
CNC Facing Centering Machine / VTL	750mm / 700mm	02 Nos.
Well Equipped Standard Room With CMM, Profile Contracer, 2D Height Gauge & Surface Roughness Tester		
Centralized Conveyor, Cooling System & Laser Marking Machine for Traceability		



Laser Marking



Facing Centering



VMC



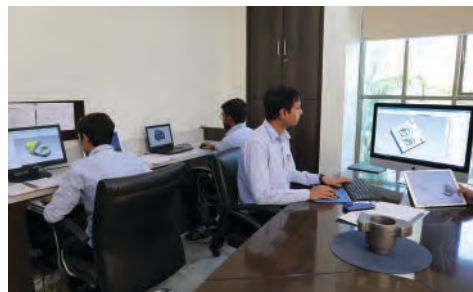
CNC



Material Handling



# A FACILITY BUILT ON WORLD CLASS QUALITY STANDARDS

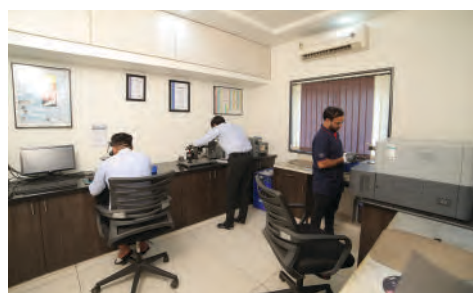


## Engineering & Design

- Well equipped with 2D-3D design software
- Centralized control of engineering documents to access easily all Departments.

## Die Manufacturing & Inspection

- Using Dies material DIN-2714 for closed die forging & H11/H13 for press forging. Hardness: 38-42 HRC
- Dies for Forging, Trimming die-Punch & Cold Coining are sinking on VMC.
- Finished Impression of Die is 100% dimensionally checked by LAYOUT INSPECTION on Plaster of Paris (POP) mould.

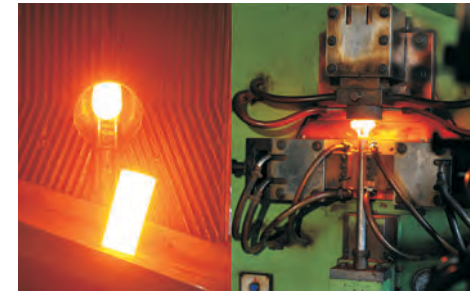


## In House Raw Material Testing

- Chemical Analysis is done by Spectrometer. Make: SpectroMaxx-Germany
- Other testing facility available like Micro cleanliness, Inclusions, Hardness, step-down test, Jominy end quenched, Grain flow and Mechanical Test.
- Metallurgical Microscope with Image Analyzer software available to check Micro structure, Grain size after Heat treatment.

## Blank Cutting

- Cut blanks are done on high productive precise circular saw machine with auto loader facility, Billet shearing machine & band saw.

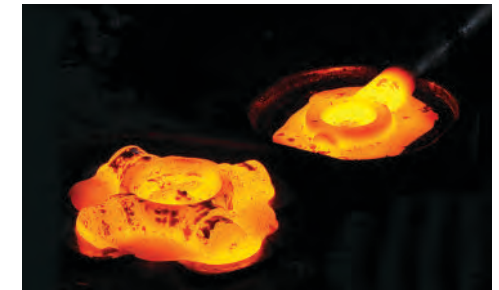


## Heating

- Cut blanks are heated by Induction billet heater in Press forging and Hammer forging & Induction Metal gathering machine for Upset forging.
- Temp.: 1150-1250 Cel.

## Forging

- Forgings operations are performed with hammers & presses includes bending, drawing down, upsetting, rolling which execute in one heating cycle to gather with finish forging.
- Subsequent Trimming operation to remove excess material is done on Power Press.



## In House Heat Treatment

- Heat treatment cycle are recorded & controlled using SCADA system.
- Continuous Tray type furnace for Quenched - Tempered, ISO-annealing & Normalizing.

## Post Operation - Shot Blasting & Fettling

- Forging surface De-scaling operation is done by Tumbler type shot blasting machine.
- Using proper grade of shots ( 0.45 & 0.55 mm) to avoid pit marks & embossed marking.
- 100% fettling is done for flash projection, burr, chopping etc.



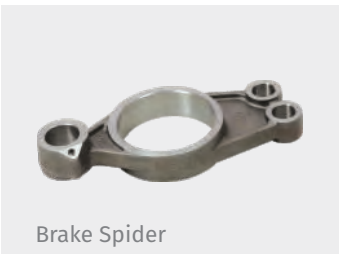
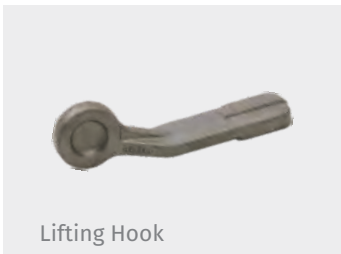
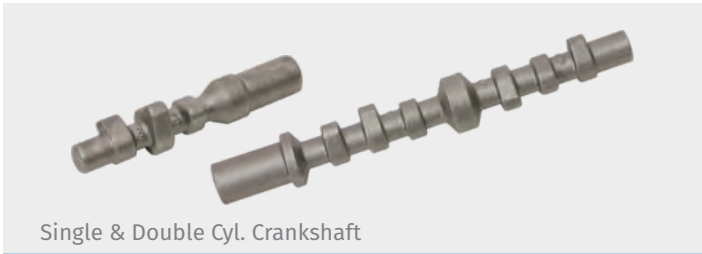
## Crack Detection - Hardness & Quality Inspection

- 100% Magnetic Particle Test (MPI) is done for all functionally critical forging OR Customer requirement.
- Hardness is checked by Brinell Hardness tester for 3000 kg load & 10mm ball dia.
- 100% visual inspection is done after shot blasting. Pre-dispatch Inspection report (PDI) is carried & sends to customer along with material.

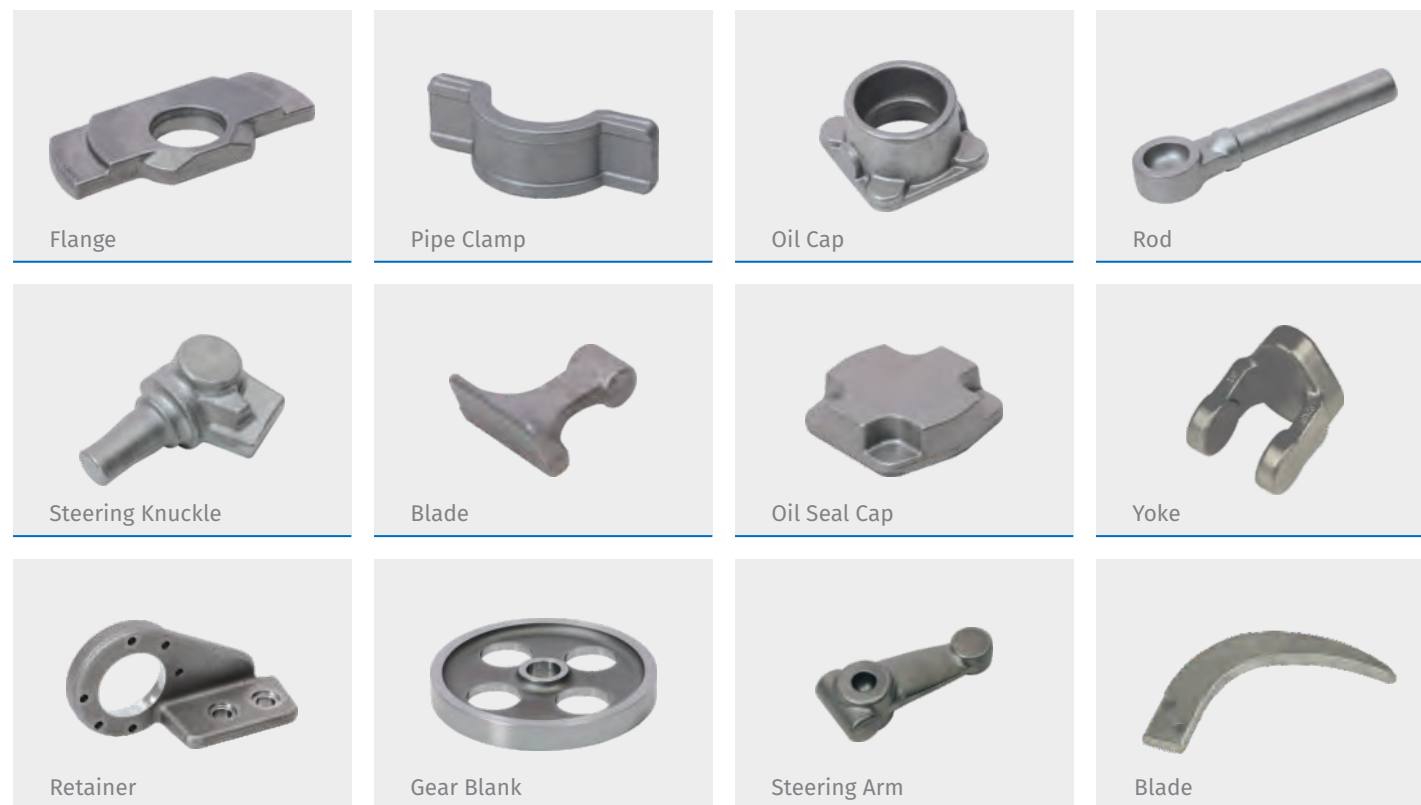
## CNC Machining.... Pentagon Forge & Machine Ltd.

- Well equipped CNC-VMC machine along with rotary tilting table facility available for ready to use or assembled components.
- Coordinate Measuring Machine (CMM) - (ACCURATE - SPECTRA), Profile Contracer Measuring System - (MITUTOYO), 2D Height Gauge Measuring Instruments - (TRIMOS) & Surface Roughness tester - (MITUTOYO) available for Precision component Measurement & testing.
- In house standard room for calibration facility.
- Laser Marking machine for traceability.









## INDUSTRIES SERVED

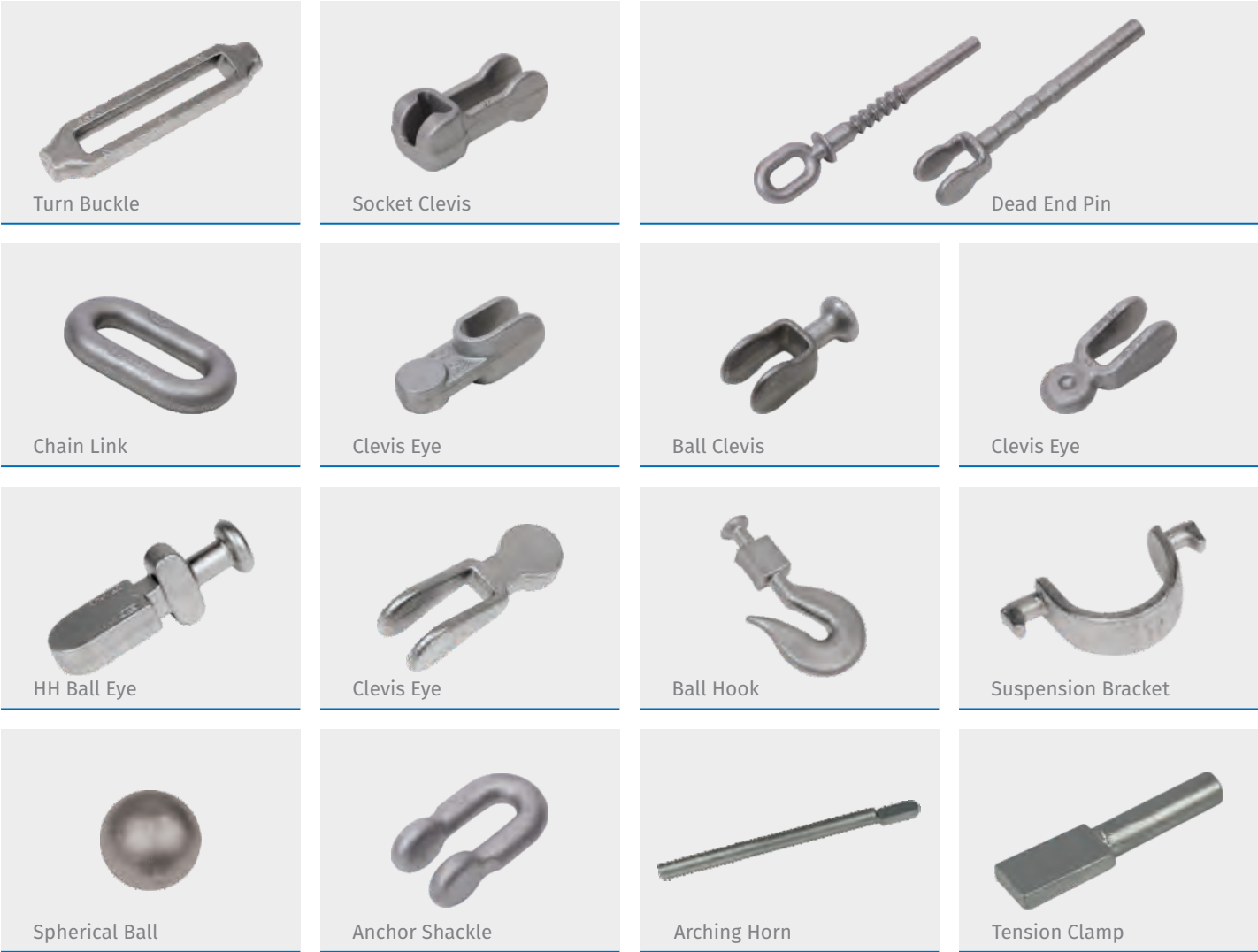
Automotive  
Infrastructure & Mining  
Tractor & Farm Equipments

Industrial Application  
Poleline Transmission  
Oil & Gas Industry

*We Undertake Custom Forging as per Clients Specification*



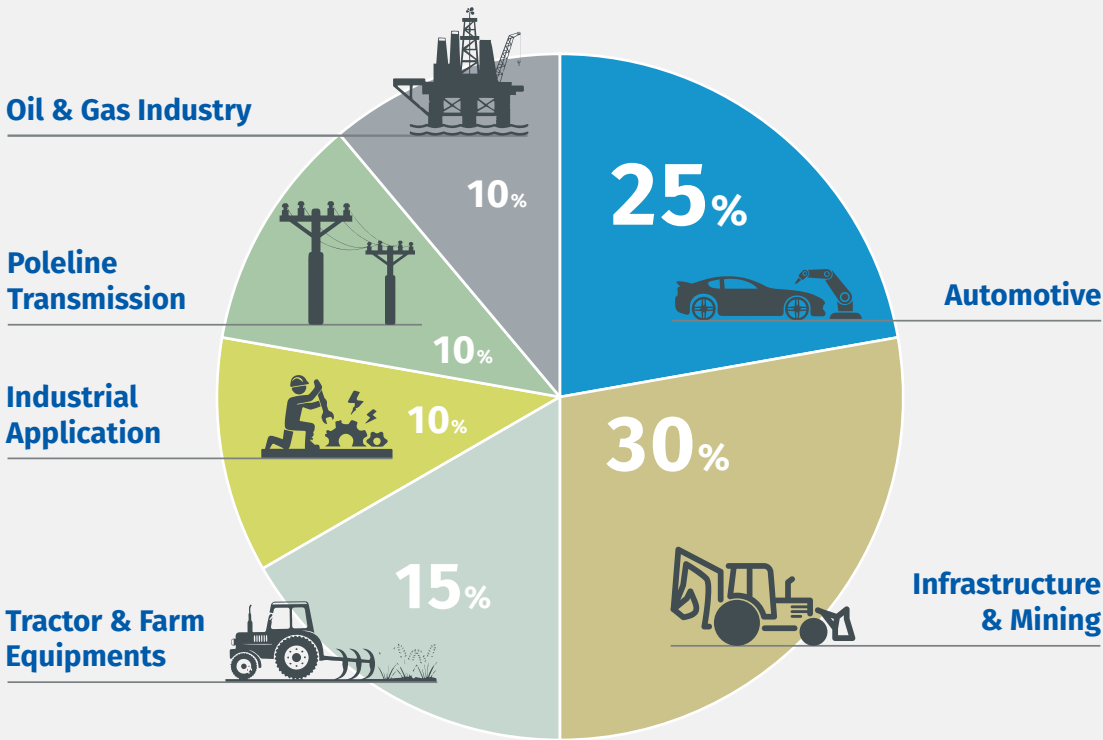
POLELINE TRANSMISSION  
(Powergrid Approved Forging Shop)



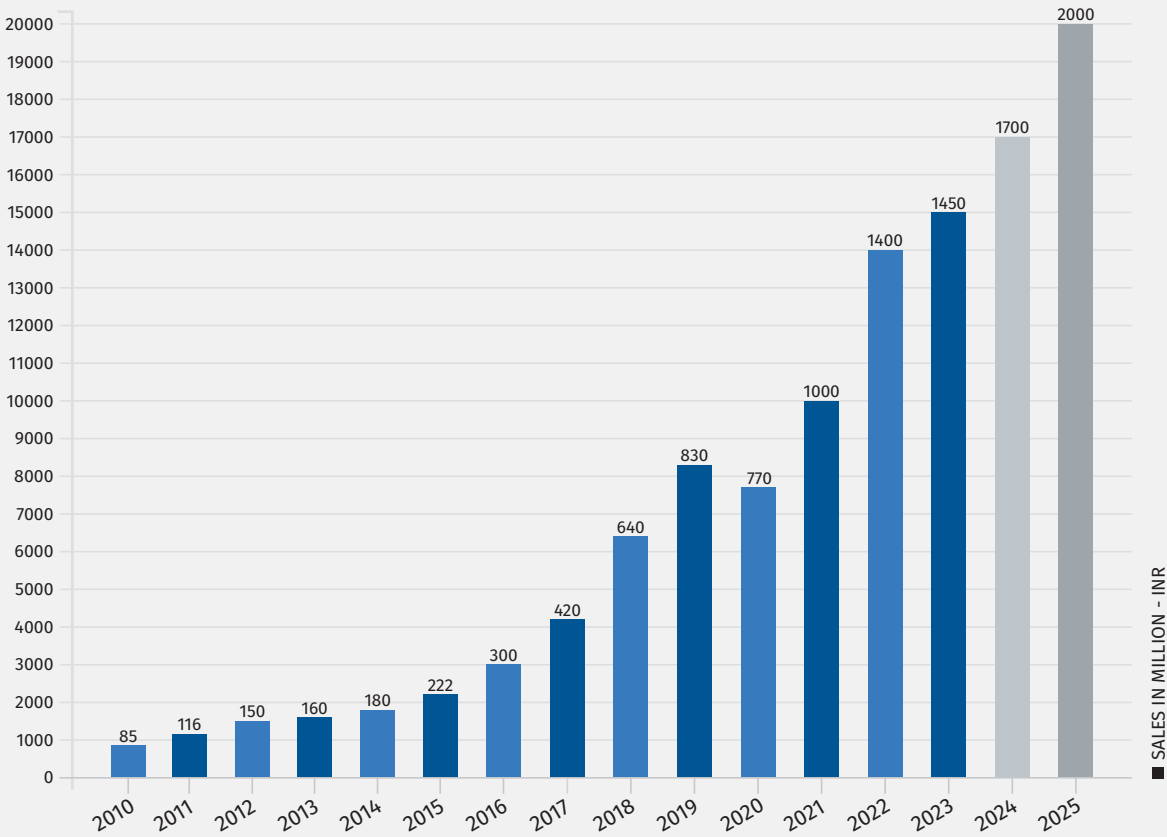
OIL & GAS INDUSTRY  
(PED & AD2000 Certified Company)



WORKING SECTOR



GROUP SALES





# FULL-FLEDGED INSPECTION TESTING FACILITY.



Coordinate Measuring Machine (CMM)



Spectrometer



Microscope (1000x)



Jominy End Quench Test



Tensile Testing (UT)



Impact Test (Izod)



2D Height Gauge (Trimos)



Hardness Test (BHN)



Crack Detection (MPI)



Die Mold Inspection (POP)



Dimensional Inspection



Material Handling



Packing

We are certified IATF 16949, ISO 9001, ISO14001, ISO45001, PED 2014/68/EU & AD 2000-Merkblatt W0 Certified company and we are also listed with D & B. Besides following quality management systems, we always strive for maintaining best quality standards and customer relationships.

## IN HOUSE RAW MATERIAL TESTING

- Chemical Analysis is done by Spectrometer. Make: SpectroMaxx- Germany
- Other testing facility available like Micro cleanliness, Inclusions, Hardness, step-down test, Jominy end quenched, Grain flow and Mechanical Test.
- Metallurgical Microscope with Image Analyzer software available to check Micro structure, Grain size after Heat treatment.
- Steel round & square are material identified by Heat & color code on both end along the length to avoid mix-up.
- Always preferred AL or Si Killed material from OEMs approved sources Like Aarti, Kalyani, Jayaswal Neco, Sunflag, SLR, Bhushan Power & steel, JSW, Arjas etc.







COMPANY



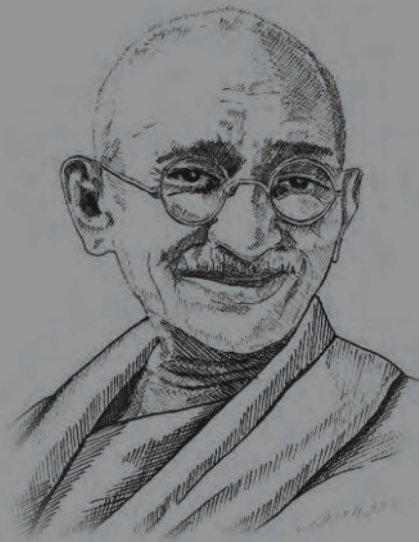
2 Decades of  
SHAPING THE STRENGTH

18  
19

# OUR POWERFUL PERFORMANCE







*A customer is the most important visitor on our premises.*

*He is not dependent on us. We are dependent on him.*

*He is not an interruption on our work. He is the purpose of it.*

*He is not an outsider on our business. He is part of it.*

*We are not doing him a favour by serving him.*

*He is doing us a favour by giving us an opportunity to do so.*

*~ Mahatma Gandhi*



# THE GREEN INITIATIVES

Clean environment is one of the most essential elements of modern industry. In an effort to reduce carbon footprint, we have enabled our in-house power consumption requirements with power supply through roof top solar plant for almost half of fuel consumption needs of the plant.



## FUTURE PLANS

- To acquire Forging simulation software for process & input weight optimization.
- To Install 4.5 MW captive solar plant (Ground Mounted) to power our sustainable operations, embracing renewable energy for a greener future.
- To develop Non-ferrous alloy forging for light weight design. Material like Aluminium, Copper, Brass, Titanium & Nickel alloy.
- Enhance forged weight capacity up to 100kg & production capacity to 36000MT per annum
- Expand Press forging, cold forging, upset forging & open die forging.

## OUR PRESENCE WORLDWIDE





Scan the QR Code to  
Save Contact with Location

# CNC FINISH FORGING MANUFACTURER & EXPORTER



**Kalaria**  
Forge Pvt. Ltd.

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Shapar (Veraval).Dist.: Rajkot (Guj.) INDIA.

Phone: +91 76009 54427

Cell: +91 98790 79127



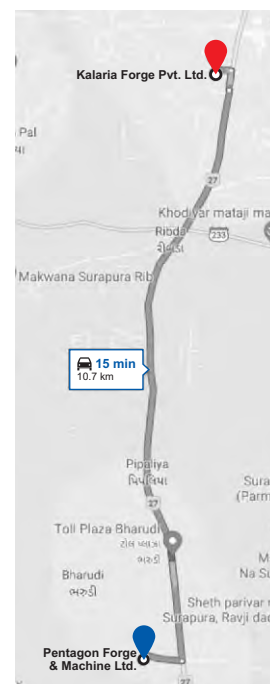
**Pentagon**  
Forge & Machine Ltd.

Works: Survey No.19-20-21, Nr. Shaktiman, NH-27,  
At Bharudi. Dist.: Rajkot (Guj.) INDIA.

Cell: +91 98250 79989

Email: [info@pentagonforge.co.in](mailto:info@pentagonforge.co.in)

Web.: [www.pentagonforge.co.in](http://www.pentagonforge.co.in)



<https://www.linkedin.com/company/pentagon-forge-&-machine-ltd->

<https://pentagonforge.co.in/video-tour.html>