PENTAGON
MACHINES AND SERVICES PRIVATE LIMITED

# **We build** the products your customers bet their business on





# ABOUT PENTAGON MACHINES AND SERVICES PVT. LTD.

Pentagon Machines and Services Pvt. Ltd. is a precision contract manufacturing company headquartered in Chennai, India. With over 45 years of experience, they have been a long term manufacturing partner to a leading multinational organisation in Australia and a prominent Indian automotive OEM. The company is part of The Sellvinds Group, a reputable, family-owned organization with a 65-year legacy in diverse manufacturing sectors, including automotive, machinery, and machine tools.

The company specializes in contract manufacturing of precision-engineered assemblies. For the past 26 years, they have supplied high pressure hydraulic sub-assemblies, including valves, gear pumps, and power take off gearboxes for various transmissions, to a long-standing client in Australia. Since 2008, the company has also produced engine balancer assemblies for Simpson & Co. Ltd., one of India's largest engine manufacturers.

Pentagon operates two highly efficient ISO 9001:2015 certified advanced manufacturing facilities totalling 43,200 square feet. These facilities feature clean room assembly, testing and automated validation technologies, as well as a comprehensive range of CNC machine tools and metrology equipment to ensure exceptional quality and reliability.

With a skilled workforce of approximately 80 employees, Pentagon has developed and exported more than 100 product types, consistently adhering to stringent industry standards.

Built on a heritage of innovation and guided by generations of engineering excellence, Pentagon continues to shape the future of precision manufacturing with vision, integrity, and purpose. Group companies within The Sellvinds Group manufacture automotive components such as cylinder heads and crankshafts for India's leading automotive OEMs.

# OUR LEGACY OF LEADERSHIP

## Ramanathan Palaniappan

### Founder Chairman, retired

A mechanical engineer from Annamalai University, he is a pioneer in India's machine tool and automotive component industry. After his career at Hindustan Machine Tools Ltd. from 1955 to 1964, he then co-founded Productivity Elements Pvt. Ltd. (PROTEL), one of India's first small-scale machine tool enterprises. Over the years, he has served on the corporate boards of Chettinad Cements Ltd., SRP Tools Ltd. and the Indian Advisory Board of the Bank of America. He has also contributed to the National Industrial Policy as a member of the Indian Planning Commission's Machine Tool Subcommittee and has served as a consultant to the United Nations. In addition to his engineering achievements, he is an acclaimed Tamil author and a recipient of state honours for his contributions to Tamil literature.

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## Natarajan Palaniappan

### Managing Director

A mechanical engineer with 36 years of experience in machine-building, automotive, and hydraulics industries, he began his career at Kareyn Precision Machines Pvt. Ltd., Dehradun, where he received two years of hands-on training under Ananth Ram Iyer, a legend of the Indian machine tool industry. A Fellow of the Indian Institute of Production Engineers, he leads Pentagon with innovation and precision. He holds a diploma in the German language and has been honoured with the prestigious Paul Harris Fellowship by Rotary International for his contributions.

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## Dr Varun Palaniappan

### Manager – Strategy and Planning

A medical graduate from Plymouth University, United Kingdom, he also holds a Bachelor of Science (Honours) degree in Surgical Design, Technology, and Innovation from Imperial College London. He completed his training through the NHS Wales Academic Foundation Programme and has authored several scientific publications. In addition, he co-founded a medical imaging start-up incubated by the Indian Institute of Technology (IIT) Madras. He now leads Pentagon's strategic growth and expansion, bringing global perspective, innovation, and academic rigor to the organization.

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## Ananth Palaniappan

### Manager – Project Engineering

A mechanical engineer with both, a Bachelor of Science and a Master of Engineering in Mechanical Engineering from Cornell University, United States, he is a graduate of King's College, Taunton, United Kingdom, where he received the Provost's Prize for Academic Excellence. A certified Six Sigma Black Belt with advanced training in SolidWorks, he spent three years at Optimus Technologies in Pittsburgh, contributing to bio-diesel engine retrofit and RFID automation projects. Now based in India, he oversees project engineering and leads expansion initiatives for the family business.

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## Line Managers

Nearly all our managers and senior staff have deep roots in machine building, combining exceptional technical skill with over two decades of loyal service to the company.

# HOW WE WORK

At Pentagon, precision dictates our every process. Every stage of our work flow is built on collaboration, technical rigour, continuous improvement to ensure each product meets the highest standards of quality & performance.

1. **Kickoff and NDA**

   Clarify client targets, standards, volumes, and PPAP reviews.

2. **DFM and Tooling**

   Provide early manufacturability feedback, fixture and gauge design, and a control plan.

3. **Open-minded attitude**

   Track record of successfully cooperating with designers to adapt drawings; flexible mindset, with willingness to invest in machines to deliver design.

4. **Prototypes**

   Develop sample builds with linked inspection and functional test reports.

5. **Validation**

   Conduct pressure/performance tests, capability runs, and packaging trials.

6. **Ramp and Sustain**

   Release, engineering change, order handling, buffer stock, and ongoing quality reporting.

7. **Environmental, Social, and Governance**

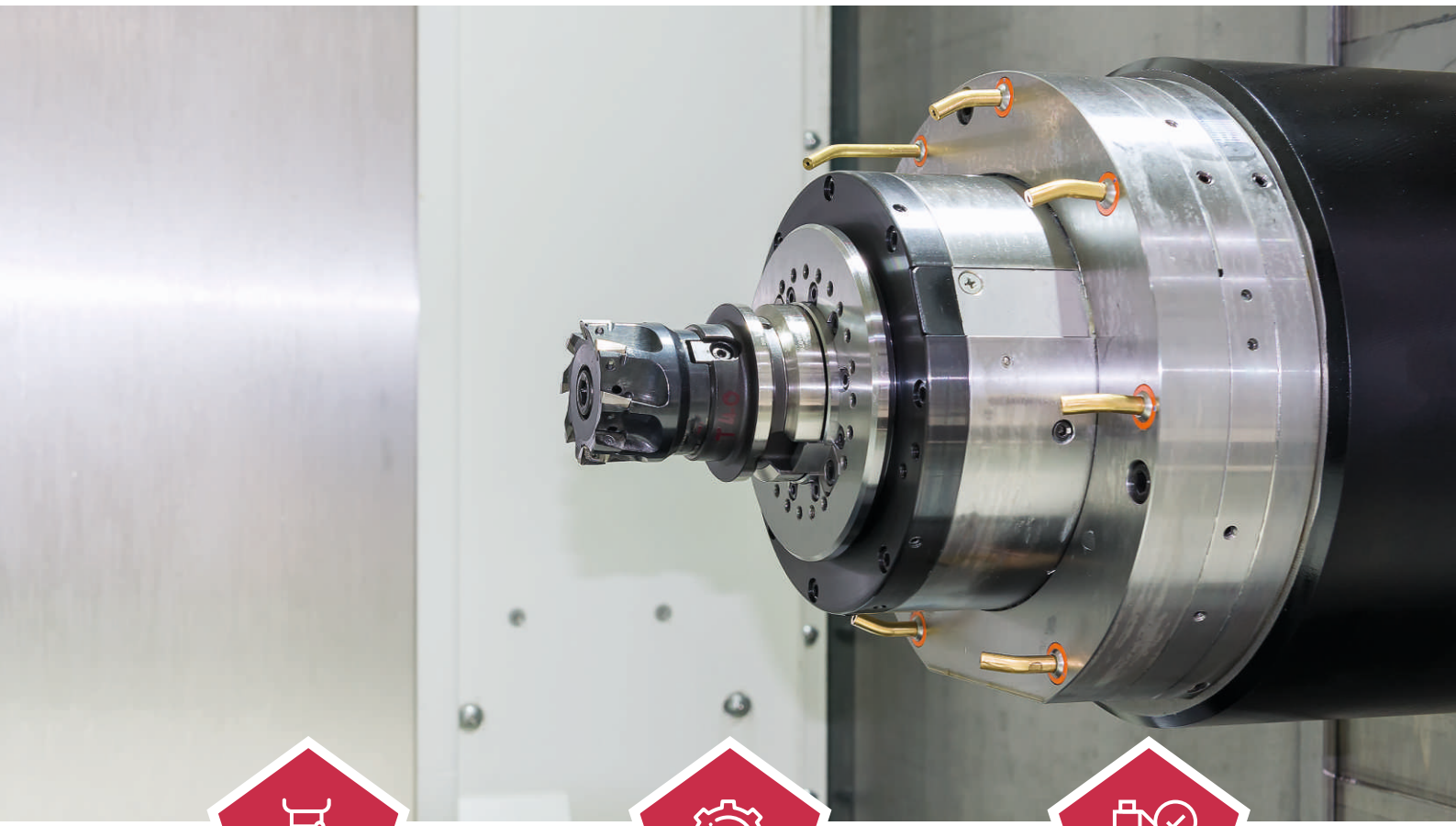
   We not only meet all statutory requirements but also set higher benchmarks for ourselves through continuous improvement.

# RFQ CHECKLIST

- 3D and 2D toleranced drawings.
- Bill of materials and expected annual volumes.
- Standards, specifications (pressure, flow, leak, noise, endurance), and test plans.
- Special processes (HT, coatings), packaging, and labelling.
- PPAP/FAI/traceability requirements and target dates.

# WHAT WE MAKE

- Precision engineering assemblies
- High-pressure hydraulic valves & gear pumps
- PTO gearboxes for a wide variety of automotive transmissions
- Engine balancer assemblies
- Precision machined components: steel, cast iron, ductile iron and non-ferrous
- Spur/helical gears (hobbed and shaved), splined shafts



## Precision Machining

- CNC horizontal and vertical machining centres
- CNC turning centres
- Fine-boring
- Surface and cylindrical grinding
- Lapping and honing
- CNC CMM and high-resolution surface metrology equipment

## Gear Cutting

- CNC turning
- CNC hobbing and shaving
- Broaching
- Tooth rounding/chamfering
- CNC bore and angular grinding
- Profile/PCD testing

## Assembly & Testing

- Clean-room builds
- Automated test rigs
- Endurance and performance checks to spec
- Painted and packed in customer-branded cartons, then securely placed in wooden crates or on pallets




## Quality & Maintenance

- ISO 9001:2015 certified
- PPAP and APQP
- Linked inspection reports and calibration program
- In-house maintenance team with technical expertise to strip, customise, and rebuild machines to industry standards

## Tooling

- In - house design and fabrication of jigs, fixtures, and gauges (manual and hydraulic)
- CNC tool presetter with an extensive range of high-end tooling

## Partner Network

- Certified heat treatment & casting/forging vendors
- Decades-long association with vendors

# SUCCESS STORIES

From legacy drawing packs to production in a matter of months, we designed jigs, fixtures, and tooling; machined housings and gears; built and tested assemblies in-house; and managed changes through multiple variants. Over the past 26 years, we have developed and supplied more than 75 varieties of PTOs, including cable-operated, pneumatic, hydraulic, and hot-shift models. Additionally, we also developed and supplied mid-engine balancer assemblies to a leading Indian OEM engine manufacturer.

### The outcome:

**Single-partner accountability, faster engineering change cycles, global field performance**

# WHY CHOOSE PENTAGON?

We're a family-run engineering team that still walks the shop floor and will always stand by our end product.

**Precision assemblies • Clean room builds • Validated with test rigs • Accountable partner from design to shipment**

## Faster development, fewer vendors

All processes, from jigs and fixtures to gear cutting, clean-room assembly and automated validation, are managed under one roof.

## Design- & quality-focused feedback

Design for Manufacturing (DFM) inputs to ensure the article's functional requirements, and not just coordinate measuring machine (CMM) specifications.

## Traceability you can trust

Every assembly carries a unique serial number tied to heat/lot data and critical dimensions.

## Proven reliability

Our dedicated team, with decades of experience, consistently upholds ISO 9001 standards to deliver products that meet the highest quality benchmarks.





# PENTAGON

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