



AVASARALA

Avasarala Technologies Limited

Facility Overview



NUCLEAR POWER



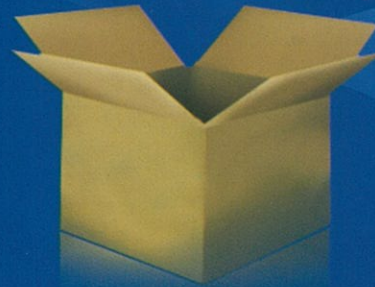
FACTORY AUTOMATION



SPACE



HEALTH CARE



INNOVATIVE SOLUTIONS



AVASARALA

Avasarala was started as a project consultancy company in 1985 by 8 Technocrats under the leadership of our beloved Chairman Shri. Avasarala Mangapathi Rao. All promoter Directors are Technocrats with decades of experience in Mechanical, Electrical & Electronics Verticals. The prime idea was to lend the technical expertise to the Indian machinery manufacturing industry. In a hope to capitalize the latent potential in this segment, AVASARALA forayed into manufacturing in the year 1986. It began the Design, Development, Fabrication, Machining and Assembly of Special Purpose Process Machinery, Development of Custom Built equipments and Automation Systems for diverse clients and applications needs in the Indian & Global arena.

During the tenure of its growth, Avasarala have executed many challenging projects with many of them with the State of the Art Manufacturing Technologies.

Business Verticals

Nuclear Power

Equipment

- Critical Reactor Elements
- Components for Fuel Bundle
- Equipments & Systems for Fuel Fabrication
- Systems for Nuclear Waste Handling

EPC Services

- Critical Piping Packages
- Maintenance Services - Life Extension
- Equipment Erection

R&D Labs & Defence Labs

- Fabrication of Test equipments & Structures
- Critical machined components/Sub assemblies
- Supply of sub systems for International R&D Program.

Space/Aerospace

- Manufacturing of Heat Pipes & Wave Guides.
- Design/Manufacture of Process Equipment.
- Critical machined components



During the process of developing equipments / processes, Avasarala have acquired certain critical Technologies by entering into Technology Transfer Agreements with most strategic sectors of Indian Industries.

Leveraging its capabilities as a technically versatile company, it diversified its business interests to allied areas. Today, Avasarala has grown into a diverse corporate entity with an established lead position in the following business verticals.

Factory Automation

Automotive

- Power train Assembly Line
- Other Solutions
- Feeder Lines: Seats, Tyres, Cockpit etc.
- ASRS Solutions: Storage & Logistics
- Pallets, Kitting Line, Engine Dressing Line
- Auto Component Industry
- Custom Built Manufacturing Solutions

Non Automotive

- Food Industries
- Electrical / Electronics Industry
- White Goods

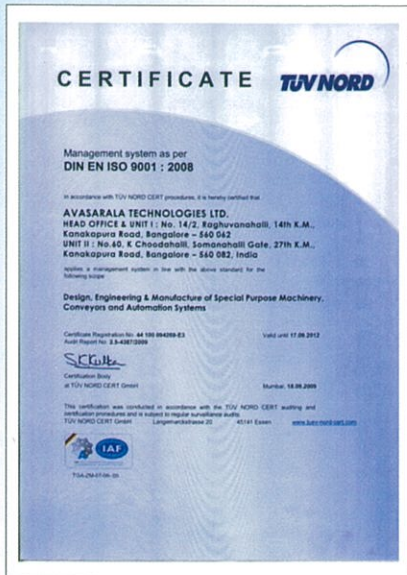
Health Care

- Anesthesia Machines
- Ventilators
- Operation Theatre Table

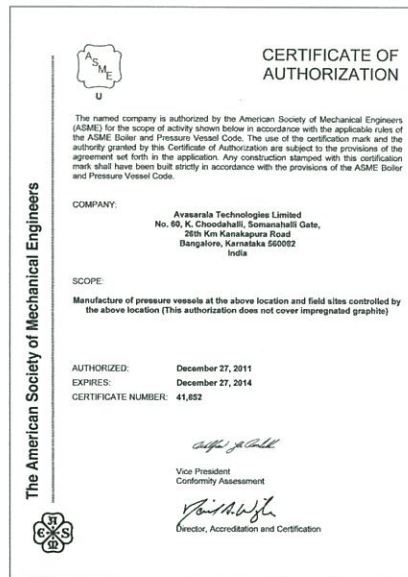


Quality Certifications

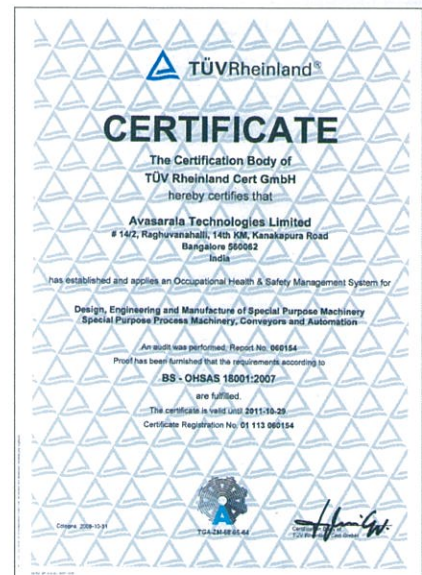
Building customer confidence by providing consistently good quality products and excellence in service through continual improvement of its processes & practices. Avasara is certified for the following International certifications.



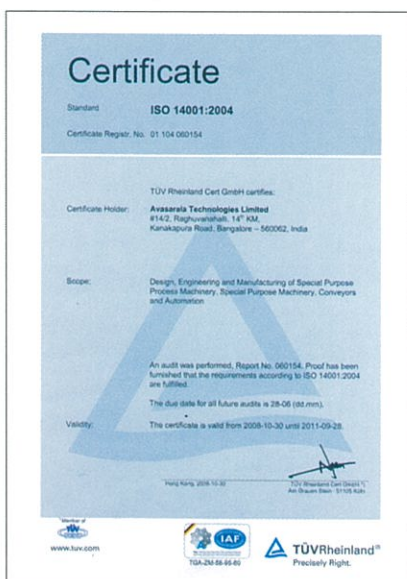
ISO 9001:2008 Quality Certificate



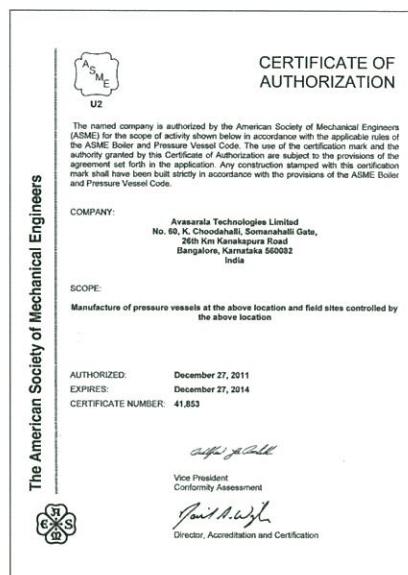
ASME U Certificate



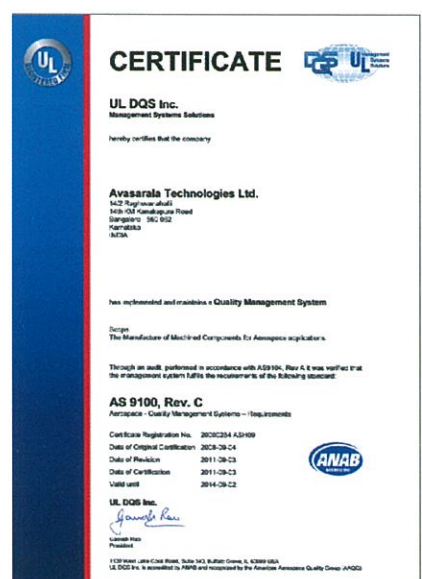
OHSAS 18001:2007 Occupational Health & Safety System



ISO 14001:2004 Environment Management System



ASME U2 Certificate



AS9100: Rev C Aerospace Standards

Note: N-Stamp Certification under Process

Facilities

Avasarala always believes in having its own Manufacturing Facility. Avasarala has built state of the Art manufacturing facility at Bangalore spread at 3 different locations & also owns plants at Pondicherry & Mysore. Over 2 decades of its existence, Avasarala continue to invest to meet the current challenges in the area of Infrastructure, World class Machineries & skilled Manpower.



Somanahalli, Bangalore



Bommasandra, Bangalore



Raghuvanahalli, Bangalore



Korkadu, Pondicherry

Somanahalli

This facility caters to the needs of the following Business

Nuclear Power

- Equipments
- Equipments for Defence R&D
- International R&D Labs
- Heavy Machining
- Carbon Steel & Stainless Steel Fabrication

Factory Automation

Total Land Area: 44,000 Sq Mtrs

Total Built Up Area: 20,000 Sq Mtrs

Avasarala has executed challenging assignments in the area of fabrication. It has the capability to take up fabrication with Carbon Steel, Stainless Steel & also with special grades of stainless steels & any Other Exotic Materials

Stainless steel Facility is totally isolated to avoid Carbon steel contamination. It has dedicated NDT level II Qualified Welders to carry out the Welding.

Building	Description	Width x Length (meters)	Crane Capacity (Tons)	Lift Ht (meters)
1.	Factory Automation Building 1	24 x 83	10	9.5
2.	Factory Automation Building 2	24 x 83	10	9.5
3.	Fabrication-Carbon Steel and Stainless Steel	25 x 76	20	10
4.	Heavy Machining	25 x 76	20	10
5.	Nuclear Power Assembly Shop	30 x 76	50	25



Fabrication Facility

- Well established, Large Fabrication & Assembly Facility
- A separate Facility for handling Stainless steel & Carbon steel material with suitable separators.
- Cater to the requirements of special Assemblies, Avasarala has created a 1, 00,000 Class Clean Room Facility.
Size: 20m X 10m X 9m Height.
- Well established Welding facilities including
 - TIG Welding
 - MIG (CO₂)welding
 - SAW
 - GTAW/SAW
 - Arc welding



Nuclear Grade Clean Room Facility



Carbon Steel Fabrication & Assembly area

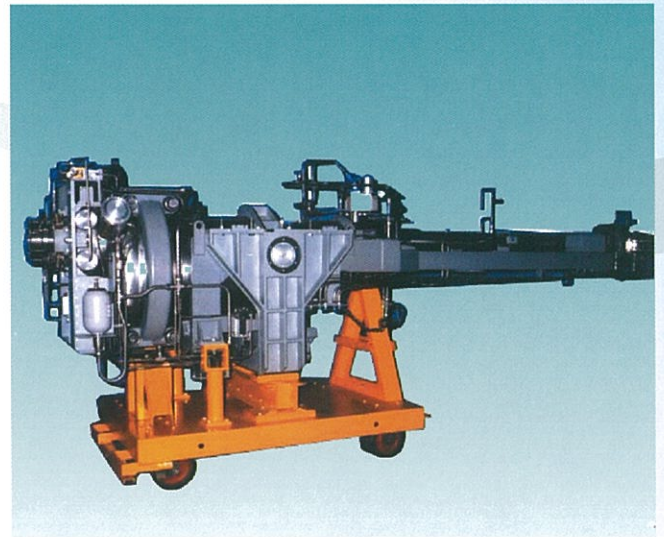


Stainless Steel Fabrication & Assembly area



Nuclear Power

Avasarala successfully forayed into Nuclear Power Machinery by meeting the demanding requirements of the customer on a continued basis. Even the most complex parts of the critical nuclear reactor fuel loading systems have been successfully met. The expertise shown in the refurbishing work for the nuclear power reactors have won accolades in the industry. Site installation activities in the realm of engineering procurement & construction through professionally managed site team is another significant contribution breaking all past records. Avasarala has significant expertise in manufacture and supply of critical Reactor area equipment, including fuel handling systems, on-site services such as installation & plant life extension.



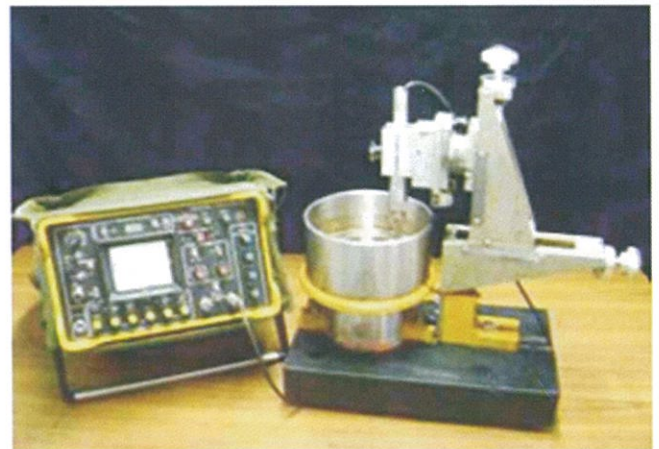
Products and Services

- Equipment, Sub assemblies in Reactor Engineering
 - Manufacture, Installation and Commissioning
- In-cell Manipulators and Automation equipments
- Material-handling systems
- Refurbishment of Nuclear Power Plants – Reactor Engineering Area
- Field support for Life Extension Programmes (Enmasse Coolant Channel replacement)
- Installation and professional site services
- Special equipment for research labs
 - Development of R & D related projects – prototype establishment and supply subsequently to running plants

On-site Services

- New Power Plant Installation Service and Refurbishment of Old Power Plants
- Coolant Channel Assembly
- Installation of
 - Reactivity Mechanisms
 - Fuel handling Equipment–Column/Bridge
 - Calandria & End Shield
 - Fuel Transfer Equipment

Non-Destructive Test Equipments (NDT)



Dye Penetrant Test (DPT)

Ultrasonic Test (UT) - (Immersion and Standard Method)

Magnetic Particle Tester (MPT)

Variety of Mechanical and digital measuring instruments,
Bore Gauges with 0.001 mm measuring resolution
Hardness Testers, Rockwell, Brinell, Vickers, Coating thickness testers - Elcometer (UK), ElektroPhysik (Germany)
Ultrasonic Thickness Gauge for long tubes, Make: OLYMPUS

Helium Leak Detectors - 3 Nos

ALCATEL - France

PFEIFFER - Germany

FILLUNGER (Portable) - India

Factory Automation

The Factory Automation Division caters to vast variety of Industries across the Spectrum of Business to provide high quality Automotive Solutions. This facility is spread over 5000 sq mtrs area & equipped with a 10 Tonne capacity EOT Crane.



Assembly Area

Automation Systems from Avasarala are characterized by compact & modular designs that match specific needs of different industries. Customized, Turnkey solutions are provided following an in-depth study of industry specific requirements & implementation from the concept of commissioning stage.

Automation solutions from Avasarala are sought after by a variety of Consumer driven industries such as Consumer Durables & Electronics (Home Appliances), Electrical Switchgear & Allied Products, Electronic Components & FMCG segments.



Kitting Line



Engine Dressing



Fail Safe Assembly Line



MCCB Assembly Line



Plastic Chain Conveyor

Raghuvanahalli

Parts Manufacturing Centre

This facility caters to the needs of all the precision component manufacturing. It is spread over 4000 sq mtrs area and equipped with CNC, Conventional, Wire cut and spark erosion machines.



Following are the list of machines.

Sl. No.	Machines	Qty. (In Nos)
1	CNC Lathe (Schaublin Make)	1
2	CNC Vertical Machining Centre	25
3	CNC Turning Centre	33
4	CNC Horizontal Machining Centre	1
5	CNC Turn Mill Centre	1
6	Jig Boring Machines	3
7	EDM Machines	11
8	Water Jet Cutting Machines	3
9	Grinding Machines	15
10	Heavy Machines	7
11	Honing Machine	1
12	Vertical Turret Lathe	1
13	Conventional Milling Machines	30
14	Conventional Lathe Machines	17
15	Slotting Machines	1
16	Drilling Machines	15
17	Punching Machine	1
18	Deep Hole Boring Machine	1
19	Cutting Machines	3
20	Other Machines	7
21	Co Ordinate Measuring M/c	2
Total Machines		179

Machinery Overview



Major Materials Handled :

- All Grades of Stainless Steel
- Carbon Steel and Cast Steel
- Aluminium
- Copper



Aluminium



Stainless Steel

Metrology Facility

Avasarala own well equipped metrology lab & has dedicated Level-II QA Engineers. The following are the in-house facility available for carrying out various tests.

Co-ordinate Measuring Machine (CMM)

Make: Brown & Sharp (USA)

Size: X / Y / Z: 1500 / 1200 / 1000

With motorized probe and latest measuring Software PCDMIS

Exotic Material Handled:

- Titanium
- Inconel
- 17-4 PH
- Phosphorus Bronze
- PH-13-8MO
- Waukesha (Nickel Based Alloy)
- Vespel
- Torlon
- Monel



Profile projector upto 20X,
Make: Nikon

Linear Height Master

Make: Mitutoyo

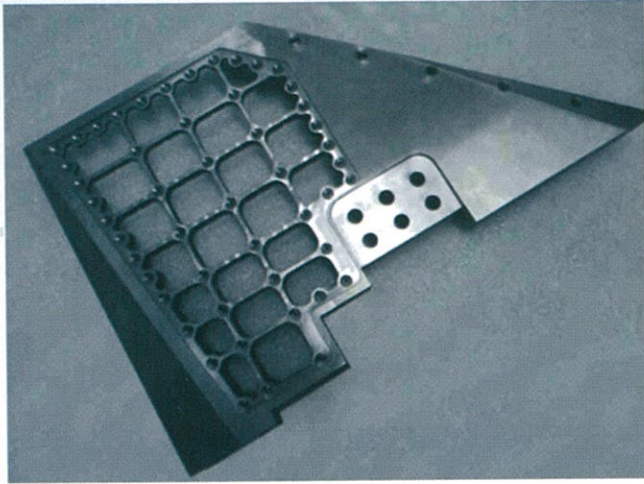
Surface Roughness Tester

Make: Mitutoyo

Avasarala's Experience in Handling Exotic Material

Critical Components

All Components having critical shape and close tolerances associated with Geometrical accuracies, high surface finish, intricate shapes for mass production



Titanium



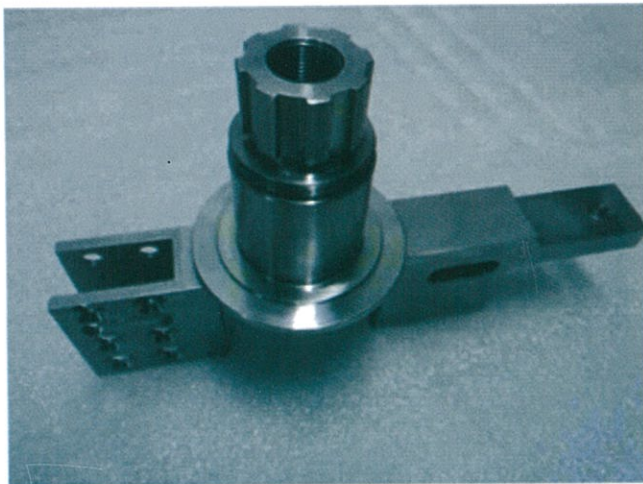
Inconel



17-4



Phosphorus Bronze



PH-13-8MO



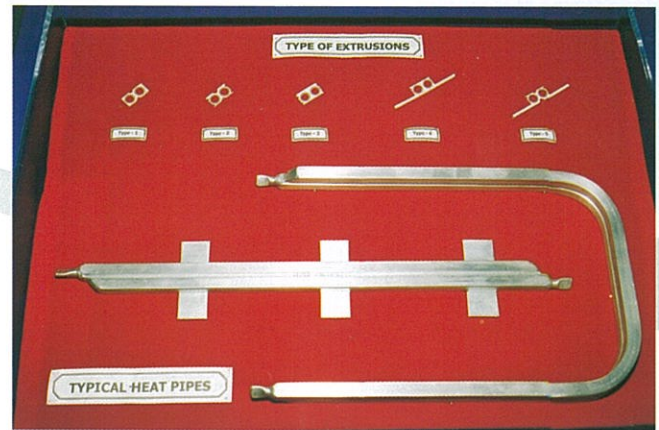
SS 316 LN

Bommasandra Space Product Division

This facility is dedicated to Manufacture Heat pipes and Wave Guides for ISRO.

Total Built Up Area: 1549 Sq Mtrs

Height: 6.79 Mtrs

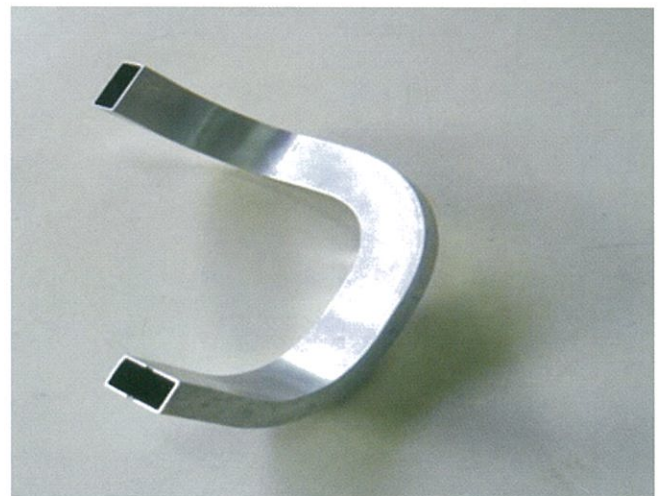
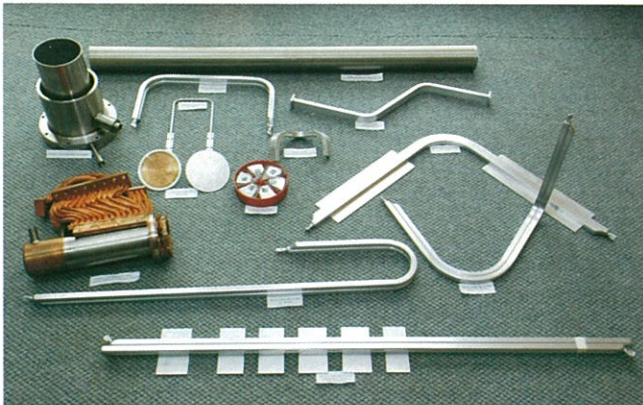


Wave Guides

- Critical space grade Aluminium section waveguides with critical dimensioning, shapes with dip brazed flanges and silver plated internals.
- The wave guides are made available as per customer requirements.
- These are approved for the space applications.

Heat Pipes

Heat pipes are used for a quick mechanism to transport heat from the spacecraft electronics and instruments to its radiators. Length of heat pipes varies from 2 to 3 Meter in different variants.



Technical features:

- Conductance aluminum alloy heat pipes.
- Straight & Bent heat pipes
- Profiles of both Single Core & Dual Core version heat pipes.
- Embedded heat pipes.
- Custom design to individual requirements.
- Qualified manufacturing process & computer assisted manufacturing and test facility.
- Working fluid: Ultra high purity ammonia.
- Heat Input: Up to 10 W/cm²
- Operating Temperature Range: -400 C to +600 C

Manufacturing Facilities

The facility has dedicated and trained technical resources to develop and Manufacture heat pipes of various configurations and Thermal systems.

Heat Pipes are manufactured in a stringent controlled processes such as Cleaning, Pressure Test, Media Charging, Thermal Cycling, Thermal Performance Testing, etc.

Manufacturing Capabilities:

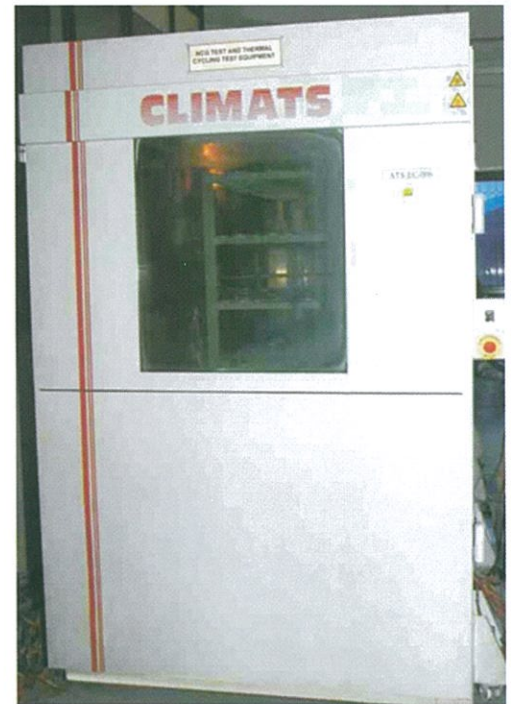
- Heat Treatment
- Precision Forming
- A1 TIG Welding
- High Pressure Test Facility
- X Ray Facility
- Environment Test Chamber
- Machining Capability
- Vacuum Systems
- Heat Transfer Checking
- Cryogenic Cooling Facility
- Data Logging



Ammonia Charging Control Panel



Chemical Cleaning



Thermal Test Chamber



Finish Set up



Pressure Testing



Thermal Performance Testing

Special Facility for Surface Treatment



Electrolyzing:

A process of Hard Chrome plating, hardness achieved is in the range of 65 min HRC to 71 HRC; Thickness 10 microns to 25 microns.



Nickel Forming:

A highly specialized capability to produce extremely thick Nickel surfaces required for critical applications. A Nickel coating of 2000 microns with in a tolerance limit of 20 microns with hardness in the range of 135 VHN.



Vacuum Furnace:

Chamber size:
Dia 0.15m x L: 0.6m
Working (Max) Temperature: 800 deg C
Vacuum Level: 3.5×10^{-2}



Nitriding:

Chamber size:
Dia 1m x 1.6m Height
Working (Max) Temperature: 600 deg C
Source of Temperature : Electrical Heaters



Precipitation Hardening:

Chamber size:
Dia 1m x 1.6m Height
Working (Max) Temperature: 600 deg C
Source of Temperature: Electrical Heaters



Hard Chrome Plating:

Tank 1 size:
W: 0.7m x H: 0.8m x L: 1.6m
Tank 2 size:
Dia 0.6m x H: 4m
Deposition thickness: 100 microns

Services

Thermal System Services

Avasarala provides onsite thermal system services for satellite integration & assembly in clean room environment. The highly skilled thermal system team provides the following services

- OSR Bonding
- Multi-Layer Insulation - MLI Fab & Implementation
- Tape Heater
- Foil Heater
- PRT / Thermister
- Thermal Control Tape
- Thermal Painting
- Thermal Grease Application
- Thermal Properties Measurement and Testing services



Pondicherry HealthCare Unit

Specialized in Manufacturing Healthcare Equipments
such as Anesthesia Machines & Ventilators, Operation Theatre table etc

Total Built Up Area: 625 Sq Mtrs, Height: 6 Mtrs



Anaesthesia Machine
'Elite 615'



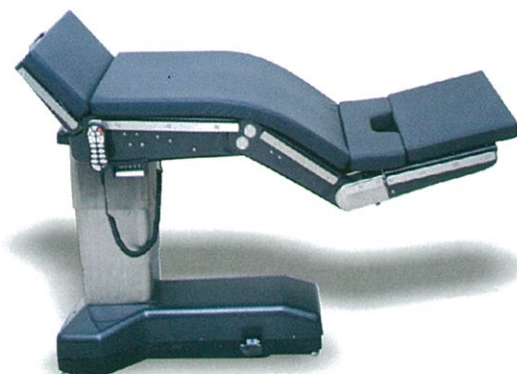
Anaesthesia Machine
'Signet 615'



Emergency Ventilator
ER100



Compact Anaesthesia Machine
AC20



Electro Hydraulic Table OT Table 777



Anaesthesia Ventilator
EV-700



Anaesthesia Ventilator
EV-500

RECOGNITION

Recognitions for Avasarala's technical excellence have come from different quarters including the Govt. of India CSIR award in process industry category.



Indian Nuclear Society
"Industrial Excellence Award"



SIATI Award
for Excellence in Aerospace
Indigenisation 2001



ELCINA Award
Indigenisation of Capital
Machinery 1987 & 1996



National Award
R & D efforts in Tungsten
Manufacturing 1998



Corporate Centre, Bangalore

Future Plans

As a part of its growth strategy, Avasarala is planning to build a integrated Heavy Machining & Fabrication Facility very close to Chennai Port. It has already acquired 30 Acres of Land with a sea front. The land is located 9 km from Ennore Port at Chennai



Above picture shows the artistic view of proposed Heavy Fabrication & Machining Facility at Chennai. Later we have plan to have our own Jetty for sea Transportation of Heavy Equipments.



Avasarala Technologies Limited

Corporate Centre

47, 36th Main, BTM 1st Stage, Dollar Scheme, Bangalore - 560 068. India. Tel. +91 (80) 2668 3860 Fax : +91 (80) 2668 3935
e-mail : ashok@avasara.com website : www.avasara.com

Works

60, K Choodahalli, Somanahalli Gate, 26th K M, Kanakapura Road, Bangalore - 560 082. India
Ph. : +91 (80) 2608 3300 Fax : +91 (80) 2608 3301 e-mail : sampathkumaran@avasara.com

Marketing Office

◆ Delhi ◆ Pune ◆ Chennai ◆ USA