Avasarala Technologies Limited

R&D PROFILE


Nuclear Power


Space


Factory Automation


Medical Equipment


R & D

Innovating Technology

www.avasarala.com

AVASARALA

Avasarala was established in 1985 as a Project Consultancy Company to lend technical expertise to the Indian machinery manufacturing industry. The group diversified into perecision assembly of electron guns, speciality metals and healthcare equipments.

The indigenous engineering design and technological strengths and capabilities acquired in the industrial automation machinery field enabled avasarala to enter the sophisticated and complicated field of strategic sectors - nuclear, space, defence and other R&D institutions.

Headquartered in Bangalore, the Company has manufacturing facilities at Bangalore and Pondicherry.

Technical competence, superior products & dedication to ongoing improvement in providing products & dedication to ongoing improvement in providing solutions makes us different from others. Alliances with world leaders in different fields enabled Avasarala to deliver high quality solutions and consistently update its processes to meet evolving demands.

Avasarala is backed by ISO 9001:2015 certification and above all Avasarala's commitment to customer delight is endorsed by its highly energized and motivated employees.

Vision

"To be a globally recognised organisation providing competitive solutions, quality products and services through innovative capabilities"

Comprehensive Engineering capability + Innovative Processes = Well Engineered Customised Solutions

Core Values & Beliefs

- Abide by fair business practices and customer-satisfaction
- Empower employees by encouraging pro-active learning and care for their welfare
- Foster continuous improvement, innovation and creativity in products and services through aligned thinking, team spirit and a partnering approach
- Lead through inspiration and thereby deliver consistent quality essential for profitability and long-term survival
- Fulfill commitments by always willing to walk the extra mile
- Protect and conserve the company's resources with the same zeal, as one would do with personal resources
- Attend to any matter pertaining to customers on an immediate basis
- Recognise problems and respond in a positive manner

Core business areas comprises of

Nuclear Power - Manufacture of Machinery, Equipments & Components for Nuclear Power Plant and R&D Institutions and Engineering Services for Plant installation and refurbishment.

Space - Manufacture of Machinery for Satellite segment and Components for Satellites. Engineering services for Satellite Industry.

Factory Automation - Assembly of Automation Lines & Industrial Conveyors.

Medical Equipment - Manufacture of Operation Theater equipment.

Outsourced Manufacturing - Tyre Building Machineries and equipment for Personal care paper products.

R&D - Participate in Domestic & International R&D programmes.

CERN - European Organisation for Nuclear Research

CERN is the world's largest particle physics research centre for Large Hadron Collider (LHC) Particle Accelerator.

The organization is located in northwest suburb of Geneva on the Franco–Swiss border and has 23 member states.

Avasarala Involvement

- Precision Magnet Positioning System

- Supplied 4,475 Nos for supporting and aligning Magnets located along 27 KM circumference in a tunnel.
- High load carrying capacity of 32 Tons in vertical and 7 Tons in transverse direction.
- Tested for static and functional aspects.
- Anti-backlash precision screw drive with 0.05 mm resolution.
- Low torque operation allowing one person to carryout precision adjustment of the magnet <100 Nm
- Exported to CERN, through RRCAT Indore.
- Delivered ahead of schedule.

Parameters :

Parameter → / Load ↓	Resolution mm	Stroke mm	Load kN	Stiffness N/mm
Transverse	0.05	± 10	70	5×10^4
Vertical	0.05	± 20	170	1×10^6

Assembly

Testing

Load Testing

Criticalities

- Validation by CERN Qualification Agency during award and execution of Contract
- Dedicated manufacturing line to implement SQC Techniques
- Process establishment for Electroless Nickel Plating for Class-I severe application (ASTM B 733)
- Stage wise adherence to Quality to ensure full interchangeability
- Clean room for Assembly and Testing
- Demonstrated capability to manufacture and supply customized equipment to overseas at par with International Standards

Handing over in presence of Dr. Anil Kakodkar on 20th Jan 2005

Word of appreciation by visiting team from CERN - as quoted by

Dr. Alain Poncet & Mr. Vittorio Parma

"The way Indian Industrial organizations like Avasarala have produced top quality products for the most ambitious scientific project of the world is certainly gratifying and demonstrates capability of the country"

TMT

THIRTY METER TELESCOPE

TMT - Thirty Meter Telescope

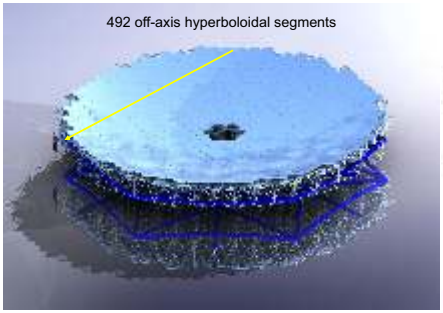
The Thirty Meter Telescope (TMT) is a proposed astronomical observatory. Planned location on Mauna Kea on the island of Hawaii in the US state of Hawaii.

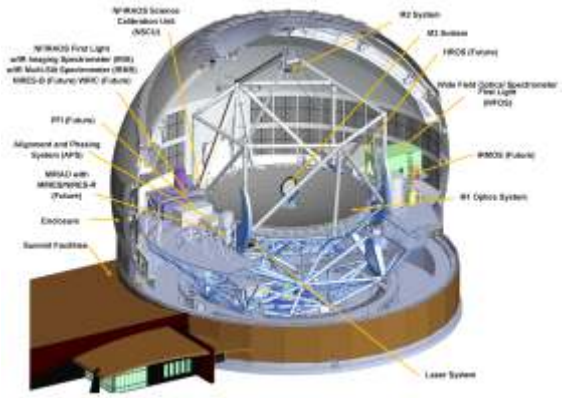
The segmented TMT Primary Mirror will be comprised of 492 independent, low expansion glass segments and nominally separated by 2.5 mm gaps.

These segments need to be maintained at the required surface accuracy, stability against structural deformations caused by temperature, gravity, wind and seismic vibrations.

Each mirror segment which is 1.44 meter across corners will be supported by a complex mirror Segment Support Assembly (SSA).

Participating countries: USA, Canada, Japan, India & China





Avasarala Involvement

- Segment Support Assembly (SSA)



Criticalities

- Machining of critical slender components with close tolerances
- Welding of Aluminium structures
- Clean room assembly work with defined sequence

Components

Central Diaphragm
Invar - 36

Lateral Guide Flexure
Al 7075 T651

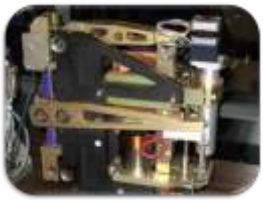
Moving Frame
Al 6061

Tower Assembly
Al 6061 Alloy. Extrusion & Casting

Mirror Simulator
Al 6061

Fixed Frame
Al 6061

Actuator Assemblies



The Thirty Meter Telescope has 492 primary mirror segments constituting Primary Segment Assembly (PSA). Actuators that control piston, tip and tilt. Total of 1476 actuators for 492 primary mirror segments.

Each actuator has a servo loop that controls small motions (nanometers) and large motions (millimeters).

Components

Upper arm

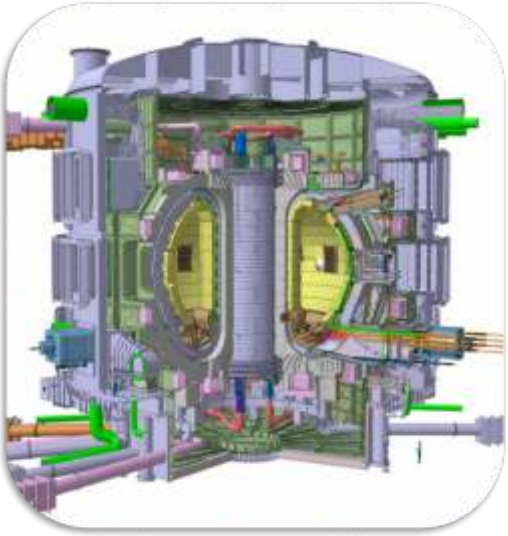
Clamp block

VC Mounting plate

Spring block

Body Casing

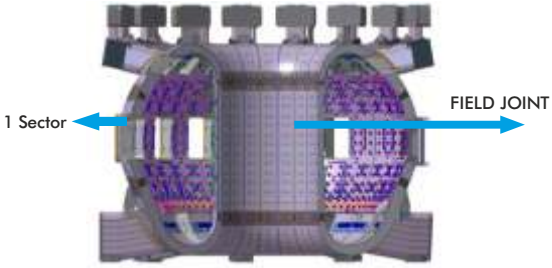
ITER - International Thermonuclear Experimental Reactor

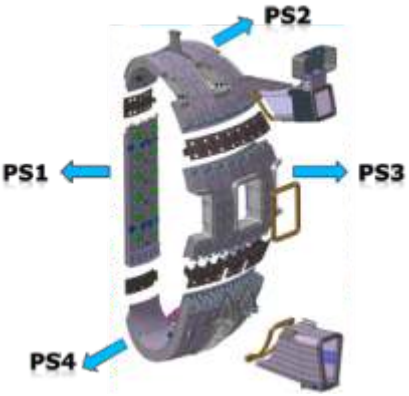


- World's first 500 MWt Fusion reactor at Cadarache, France
- Joint International Research and Development Project
- Collaborative effort of 35 counties
- Project cost - around 18 Billion Euros
- India's contribution - around 1.6 Billion Euros

Avasarala Involvements

- Supply of Vacuum Vessel In-Wall Shields





ITER Vacuum vessel is divided into 9 sectors
Sectors are connected to each other by field joints

IWS Block Assemblies

Criticalities

- Establishment of
  - International quality procedures for manufacturing
  - Manufacturing parameters for Borated stainless steel plates
  - Ultrasonic cleaning facility
  - XM-19 stainless steel & Inconel Fasteners
  - Dedicated Water Jet & Assembly Clean room facility
- Design and development of anti-rotation washers
- Assembly of 8,000 block assemblies with 58,000 unique plates

Exclusive Facilities Established

Water Jet Cutting

CNC M/c Shop

Cleaning Facility

Assembly Clean Room

Mile Stones

Contract Signing
1st Sep. 2010

MRR for PS-1
10th June 2011

First set of IWS blocks
ATL to HHI S.Korea, Dec 2015

Document hand over - Completion of IWS Blocks
for One Vessel sector 28th June 2016

Visit of Director General
Dr. Bernard BIGOT 23rd Aug 2016

Avasarala's association with R&D Institutes

Indian Institute of Astrophysics (IIAP)

Gamma Ray Telescope (HAGAR)

HAGAR Telescope is used to detect Celestial gamma rays of high energy.

Site Location

Assembly at shop

Handing over - 1st July 2006

Avasarala Involvement

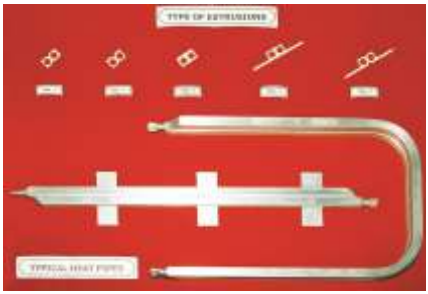
- Supplied 5 Nos to IIAP & Installed at Hanle in Ladakh at 4,200 m altitude
- Demonstrated ability to build Optical equipment
- Site installation at high altitude in record time

80 cm Schmidt Telescope

- Supplied & Installed at Aryabhatta Research Institute of Observational Sciences (ARIES), Nainital
- Spherical primary mirror which is 80 cm in diameter

Indian Space Research Organisation (ISRO)

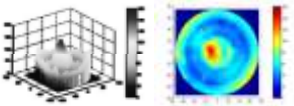
Heat Pipes



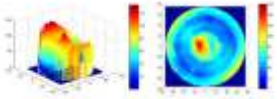
- Heat pipes are part of satellite Thermal Management System
- Product jointly developed with ISRO
- Key Benefits: Quick Heat Transfer & Low mass
- Working fluid: High purity Ammonia
- Established dedicated Manufacturing and Test facility
- Supplied around 4,000 Nos since 2003

Ion Beam Milling System (IBMS)

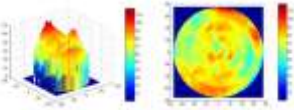
Polishing Performance



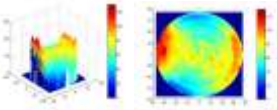
ORGINAL SURFACE
PV = 161.1366 nanometers = 0.2546 λ (λ / 3.9277)
RMS = 20.1226 nanometers = 0.0318 λ (λ / 31.4465)



Polishing 1
PV = 132.9695 nanometers = 0.2101 λ (λ / 4.756)
RMS = 16.7284 nanometers = 0.0264 λ (λ / 37.8787)
POLISHING TIME: 137 MINS



Polishing 2
PV = 118.4365 nanometers = 0.1872 λ (λ / 5.3418)
RMS = 10.9539 nanometers = 0.0173 λ (λ / 57.8034)
POLISHING TIME :- 114 MINS



Polishing 3 (Final Surface)
PV = 52.7333 nanometers = 0.0833 λ (λ / 12)
RMS = 6.328 nanometers = 0.01 λ (λ / 100)
POLISHING TIME :- 234 MINS

- Used for Polishing mirror to a Surface Finish of 10 Nanometres
- Designed and manufactured for processing optics of size 1.3 m dia x 0.15 m thickness
- Non-contact polishing technique using Ion Beam
- SS 304 L Chamber: 3.2 m dia x 2 m long & Vacuum: 1 x 10^{-6} mbar

Avasarala participation in other R&D programmes

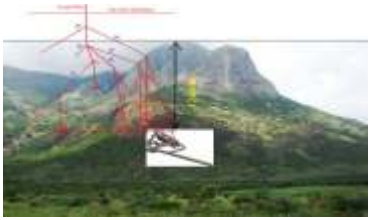
FAIR - Facility for Antiproton and Ion Research

- FAIR is one of the largest international research facility in the world, coming up at Darmstadt, Germany
- To study structure of matter and the evolution of the universe from the Big Bang
- Submitted Expression Of Interest (EOI) for Beam Stopper
- Interested to participate in manufacturing Ultra High Vacuum Chambers

Vacuum Chambers

Beam Stopper

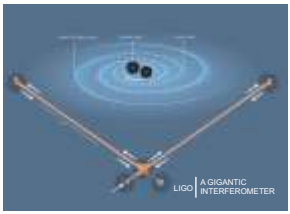
Keen to explore opportunities from the following R&D programmes:



India-based Neutrino Observatory (INO)

SQUARE KILOMETRE ARRAY

Square Kilometer Array (SKA)



Laser Interferometer Gravitational-Wave Observatory (LIGO)

AVASARALA

Our Infrastructure / Facilities

Manufacturing Unit

Assembly Area

Clean Room Facility

CNC Machine Shop

Jig Boring

Grinding

Heavy Machine Shop

Infrastructure

- Total Land Area : 53,000 Sq. Mtrs.
- Total Built up Area : 15,000 Sq. Mtrs.
- Max Assembly Height : 21 Mtrs. (Below crane hook)
- Max Crane Capacity : 50 Tons

Building	Description	Length (meters)	Width (meters)	Height (meters)	Crane Capacity (Tons)
1	Export Oriented Unit	83	24	9.5	10
2	Factory Automation	83	24	9.5	10
3	Fabrication – Carbon Steel & Stainless Steel	76	25	15	20
4	Heavy Machining	76	25	15	20
5	Assembly & Testing Facility	76	30	25	50

Quality System Certificates

Certified for QMS & Medical Equipments

CERTIFICATE

Management system as per
ISO 9001 : 2015

AVASARALA TECHNOLOGIES LIMITED

Design, Engineering and Manufacture of Special Purpose Machines and Supply of Precision Machined Components for Industrial and Strategic Applications

ISO 9001 : 2015

CERTIFICATE

No. 15 0181 SJ

Avasarala Technologies Limited
Healthcare Division

EN ISO 13485:2012

EN ISO 13485 : 2012

RECOGNITION

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


WHIRLPOOL OF INDIA LTD
Pondicherry

EXCELLENCE AWARD

The management of Whirlpool of India Limited takes great pleasure in recognising your excellent performance in the area of

We appreciate your hard work, Commitment and dedication

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

Somanahalli, Bangalore

Bommasandra, Bangalore

AVASARALA

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Manufacturing Unit

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