



HHV Group

**LARGE AREA TELESCOPE MIRROR
COATING SYSTEMS**

HHV Group

HHV Thermal Technologies

Thermal Vacuum Furnaces

Specializes in building vacuum furnaces, hot presses and special purpose vacuum equipment for complex metallurgical applications.



Carbon Composites

High temperature carbon-carbon composites used in Space and Defence applications



HHV Advanced Technologies

Thin Films & Optics

Designs and fabricates optics and thin film coatings for optical, functional and decorative applications.



Thin Film Equipment

Manufactures a wide range of PVD and CVD coating systems starting from bench top to industrial-scale vacuum coating systems.



HHV Ltd

HHV Ltd is the international unit of the HHV Group

Established in 2009 in the United Kingdom

HHV Ltd. holds an exclusive license from Edwards Vacuum to manufacture the Auto306, Auto500, TF600, ID500 and ID750 deposition systems

ASM-HHV Engineering

Joint venture between ASM Technologies and the HHV Group

Established India's first semiconductor focused equipment manufacturing facility

Expertise in designing and manufacturing semiconductor tools, sub-systems, systems components and providing field support



Group Profile

4

Manufacturing Plants (+150,000 sq ft, ISO 7 and 8 cleanrooms)

10

International Distributors

30+

OEM Partners

1

International Office

750+

Employees

60+

Years of Excellence

ISO Certified

Quality systems across all operations. management

DSIR Recognized R&D

5% of annual revenue allocated to R&D activities.

Women in STEM

Recognized as a top 50 MSME in India .

Industry Academia MOUs

SIT Tumkur to build a skills lab, Reva University and JNCASR for joint research

Aluminum Coating Plant for 2.1 m Ø mirror

Indian Institute of Astrophysics (IIAP), Hanle Observatory, India



Technical specification:

- Deposition technique: Thermal and E-beam evaporation
- Ion bombardment cleaning gadget
- Mirror weight: 1.0 ton
- Chamber size: 2.6m (Ø) x 2.1m (H)
- Vacuum system: Diffusion pump backed with roots-rotary pump combination
- Ultimate vacuum: 1×10^{-6} mbar



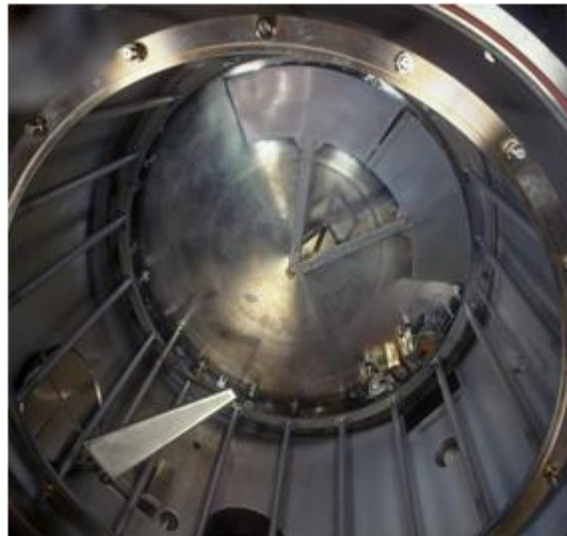
Sputter Coater chamber open view



Hydraulic swelling mechanism



Side view of the chamber



Internal chamber view



Mirror holding assembly

Aluminum Coating Plant for 2.2 m Ø mirror

Inter-University Centre for Astronomy and Astrophysics (IUCAA), Girawali Observatory, India



Technical specification:

- Deposition Technique: Downward Sputtering
- Mirror weight: 0.25 ton
- Chamber size: 2.6 m (Ø) x 0.8 m (H)
- Vacuum system: Turbo-molecular pumps backed with roots-rotary pump combination
- Ultimate vacuum: 5×10^{-7} mbar



Sputter Coater chamber



Sputter top view



Magnetron cathode

Aluminum Coating Plant for 3.7 m Ø mirror

Aryabhata Research Institute of Observational Sciences (ARIES), Nainital, India.



Technical specification:

- Deposition Technique: Sputtering
- Mirror weight: 4.5 ton
- Chamber size: 4.0m (Ø) x 1.7m (H)
- Vacuum system: Cryo pumps backed by rotary/Roots combination
- Ultimate vacuum: 1×10^{-6} mbar



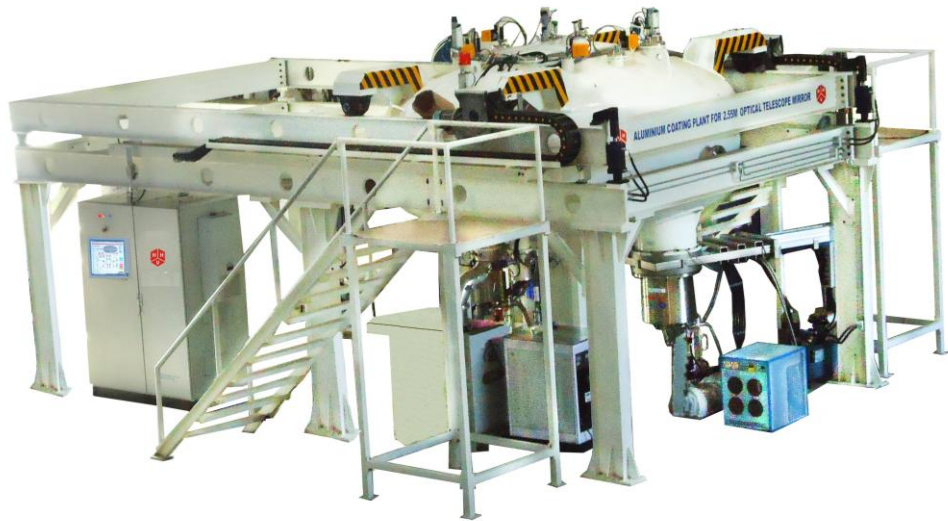
Sputter Coater chamber open view



Wiffle tree with test Coupons

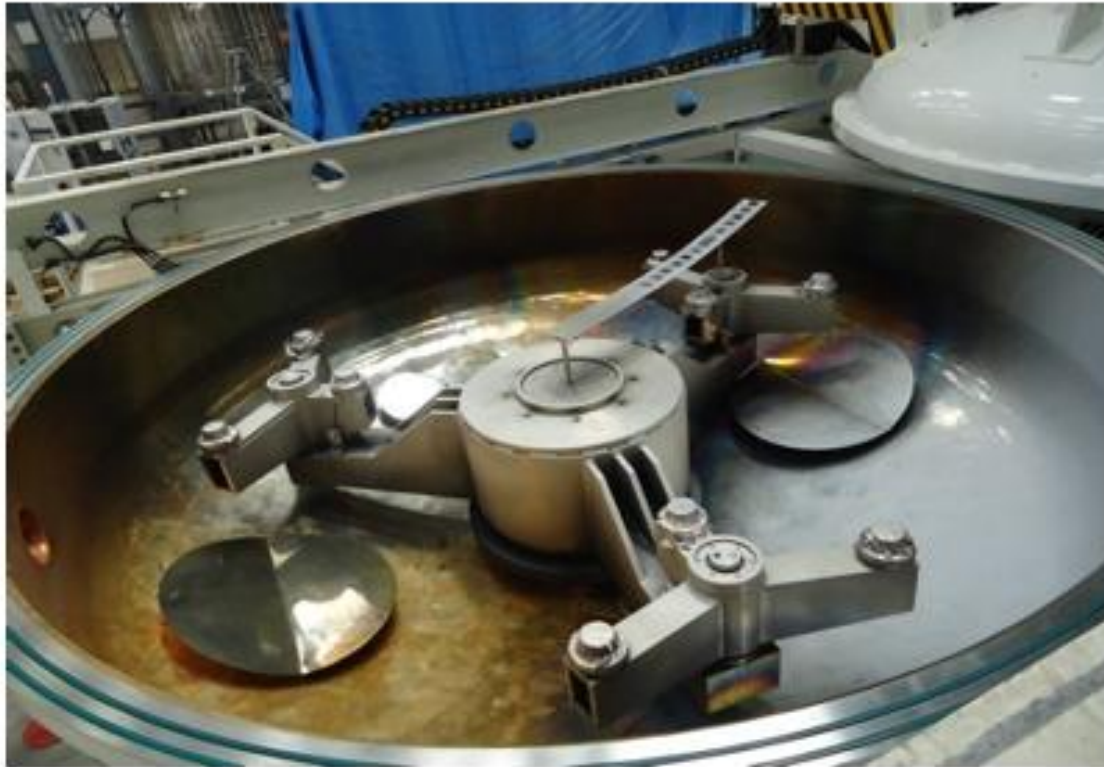
Chromium and Silver/Aluminum Coating Plant for 2.5 m Ø mirror

Sternberg Astronomical Institute, Moscow State University. Russia



Technical specifications:

- Deposition Technique: Magnetron Sputtering for Al-mirrors protected by SiO₂ layers and Cr based Silver coating protected by SiO₂
- Ion source for pre-clean
- Mirror weight: 3.0 ton
- Chamber size: 3.1m (Diameter) x 1.5m (Height)
- Vacuum system: Cryo pumps with rotary/roots and dry pump combination
- Ultimate vacuum: 1×10^{-6} mbar



Sputter Coater chamber open view



Magnetron cathodes

Aluminum Coating Plant for 2.1 m Ø mirror

Indian Astronomical Observatory, Hanle, India



Technical specifications:

- Deposition Technique: Magnetron Sputtering
- Ion bombardment gadget for pre-cleaning
- Mirror weight: 1.0 ton
- Chamber size: 2.6m (Ø) x 1.6 m (H)
- Vacuum system: Turbomolecular pump backed by rotary/roots combination
- Ultimate vacuum: 1×10^{-6} mbar

Aluminum/Silver Coating Plant For 0.5 m Ø mirror

Physical Research Laboratory, Udaipur, India



Technical specifications:

- Deposition Technique: Thermal evaporation and E-beam
- Mirror weight: 0.1 ton
- Chamber size: 800mm (D) x 800mm (W) x 1000mm (H)
- Vacuum system: Turbomolecular pump backed by rotary/roots combination
- Ultimate vacuum: 5×10^{-7} mbar

Aluminum Coating Plant for 2.1 m Ø mirror

Physical Research Laboratory, Udaipur, India



Technical specifications:

- Deposition Technique: Downward Thermal Evaporation
- 72 Tungsten filament configured for downward evaporation
- Glow discharge source for In-situ substrate cleaning
- Chamber size: 3.2m (Diameter) x 3.5 m (height)
- Vacuum system: Cryo pumps backed by rotary/roots and dry pump combination
- Ultimate vacuum: 1×10^{-6} mbar



Chamber internal view during process



Contact Us

Head Office - Manufacturing, Sales, Service:

- Bangalore, India

Sales and Service

Domestic:

- New Delhi
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- Kanpur
- Kolkata
- Ahmedabad
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- Hyderabad
- Trivandrum
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