



TAPP INDIA

HIGH QUALITY INSULATION

(A Joint Venture with Heinrich Tapp GmbH)



Make in India Since 2017



Basic Principle

“We understand ourselves as an industrial insulation service provider, specialized in the fields of power generation, e.g. steam & gas turbines, (petro-) chemical as well as industrial facilities.”

TAPP INDIA PVT LTD

HIGH QUALITY INSULATION

**Plot No. 2, Khasra No. 1339, Opp. Sidcul Sector-2, Salempur
Mehdood-2, Haridwar - 249402 Uttarakhand (India)**

Phone - +91 9411111628

www.tapp-india.in

Email: - contact@tapp-india.com



History



Made in Germany since 1909:

- 1909: Production of insulation materials
- 1909: Insulation jobs for steam locomotives
- 1920: Assembly & service for industrial insulation
- 1960: Insulation supply for power plant turbines
- 1970: Insulation supply for industrial turbines
- 2010: Supply for gas turbines
- 2017: Production facility in India





Make in India since 2017

TAPP India is:

- Offering holistic project management for all kinds of industrial insulation
- Achieving customer satisfaction by service-oriented processes
- Proving high level of technological knowledge
- Employing creative and flexible approaches
- Providing motivated, skilled and responsible staff
- Delivering sustainable results in terms of products and services
- Made in Germany since 1909
- Make in India since 2017





Key Customers

OEM:

- BHEL
- General Electric
- M+M Turbinen-Technik
- MAN Diesel & Turbo
- MTU Aeroengines
- Siemens



Plant Operators:

- BASF
- Bayer
- BP
- E.ON / Uniper
- RWE / Innogy
- Shell
- Total



Energising a Brighter Tomorrow



Holistic Project Management

Providing 100% project management:

- Always staying connected with our customers and providing fast response
- Taking care of all project steps:
 - Order Management
 - Engineering
 - Manufacturing
 - Logistics
 - Assembly & Field Service
 - Maintenance & Repair
- Using up to date project management tools





Product Range

Engineering

Manufacturing

- Glass Fiber Pillows
- Glass Fiber Cover
- Heat Retention Shield
- Enclosure
- Spray Insulation
- Parting Joint Cassettes
- Combined Noise & Heat Insulation
- Acoustic Insulation
- Sheet Metal Jacketing

Logistics

Assembly & Field Services

Maintenance & Repair





Engineering I



Custom design:

- Insulation design to heat loss calculation, geometric requirements, customer's specifications and cost
- Engineering directly based upon construction plans in all common CAD files in 3D
- Subsequent processing of technical and isometric drawings as well as dimensional sketches likewise
- Up to date CAD software (e.g. Siemens NX, AutoCAD)
- Accurate object measuring on site by experienced construction engineers if necessary
- Auto generated BOM for procurement
- Detailed manufacturing and documentation records
- Providing engineering support and consultancy on customer's specifications





Engineering II – heat calculation / heat transition

Custom performance:

- Calculation of Insulation according to (ASTM, DIN/EN, AGI Q, VDI):
 - Operating temperature
 - Maximum insulation surface temperature
 - Maximum heat loss
 - Costs efficiency
 - Installation conditions
 - Available space / geometric requirements
- Customized database of various different materials as well as combined materials available
- Calculation can be provided as part of customers documentation

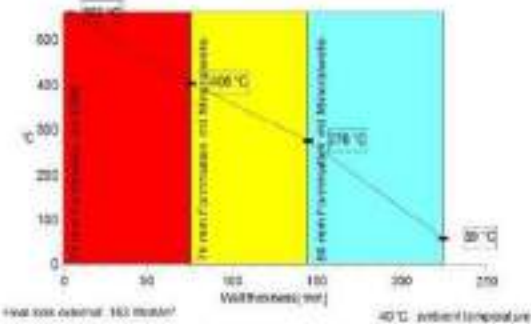
STATIONARY HEAT TRANSITION CALCULATION: 2017-10-18 14:31:50h

For Comp. presentation: Driving Nr:
 Plan: presentation: Refuse:

1 Layer Filz Insulation Temp. calculation: 8
 external: wind velocity = 0.5 m/s
 Cylinder horizontal, current direction horizontal
 emission grade = 0.950 surface Glass Fiber Tissue
 heat trans. coeff. = 8.41 W/m²K after VDI 2066 chapter 2.2.2.1

Row thickness [mm]	Material	Temperature °C	Therm. cond. W/m ² K	Surf. W/m ²	Weight kg/m ²
		internal wall temp. 500			
75	Filz / GMB		0.0668	17553	7.704
70	Filz / Mineral Wool	406	0.0403	17550	8.941
80	Filz / Mineral Wool	276	0.0408	17550	12.952
225 total		external temperature 40		kg/m ² outer surface = 30.640	
1500	= diameter internal			kg/m Cylinder = 164.058	
1500	= diameter external * p * heat loss: 163 Wadm ²		0.990 W/m ² Cylinder		

*) thermal conductivity integral after ASTM C 690-90 formula (26)



Material data base: 2017-10-18

Mat-Nr	Material	Density kg/m ³	Therm. cond. W/m ² K	Remarks
11331	Filz / GMB	8.738	0.0668	Glass Fiber Tissue
11330	Filz / Mineral Wool	8.181	0.0403	Glass Fiber Tissue
11320	Filz / Mineral Wool	8.181	0.0408	Glass Fiber Tissue

Heat transition calculations are theoretical and calculated depending on the well known parameters as therm. cond., heat transfer coef., wall thickness, etc. Heat bridges as anchors, openings, mortar-joints are not regarded. All data are calculated only with the usual tolerances.



Manufacturing

Custom fit:

- Manufacturing and pre-fabrication of all insulation components according to CAD data
- Variety of manufacturing procedures performed in parallel to shorten lead times
- Use application of CAD/CAM precision machinery for metal processing
- Assembly-experienced staff to respect site-necessities





Products: Glass Fiber Pillows I



Pillow insulation (flat shape) on steam turbine



Products: Glass Fiber Pillows II



Spray insulation



Pillow insulation

Red color was provided on special customer's request

Switch from spray insulation to pillow insulation after main overhauling

- Removal of old spray insulation and measurement of turbine
- Design and fabrication of insulation pillows during overhauling
- Assembling of new insulation pillows at end of overhauling (approx. 5 weeks)



Products: Glass Fiber Pillows III



Pillow insulation (spherical shape) on gas turbine



Products: Glass Fiber Pillows IV

Technical Advantages:

- Different insulation thicknesses (same heat loss) possible due to use of different filling materials
- Different designs available:
 - Multilayer with flat shapes
 - Single layer with spherical shape
- Available for all additional components, e.g. Flanges and Valves, requiring regular maintenance



Pillow insulation (spherical shape) on steam turbine piping

Plant Operator's Benefits:

- Long-term savings due to reusability after turbine overhauling
- Mid-term savings due to short assembly and disassembly times during turbine outage / overhauling
- Single piece identification tag enables quick and cost-efficient replacement



Pillow insulation (flat shape) on steam turbine



Products: Glass Fiber Covering I



Glass fiber cover on steam turbine



Products: Glass Fiber Covering II

Technical Advantages:

- Protection of insulation pillows against contamination caused by:
 - Dust and Dirt
 - Chemical Deposits
 - Oil Spillage
 - Sandy Environment
- Tool-free assembly and disassembly
- Improving optical appearance, various kinds of materials available

Plant Operator's Benefits:

- Savings on spare parts during overhauling
- Savings due to fast disassembly and assembly before and after overhauling



Glass fiber cover on steam turbine



Products: Heat Retention Shield I



Heat retention shield made of duet stainless steel sheet



Products: Heat Retention Shield II

Technical Advantages:

- Clear separation between insulation and bearing (convection next to bearing casing)
- Improved control of oil temperature and oil quality
- Full access on bearing without removing any insulation

Plant Operator's Benefits:

- Savings due to reduced oil exchange during overhauling
- Savings due to shorter overhauling time for bearings



Pillow insulation with sandwich heat retention shield on industrial steam turbine



Products: Enclosure I



Enclosure on industrial steam turbine



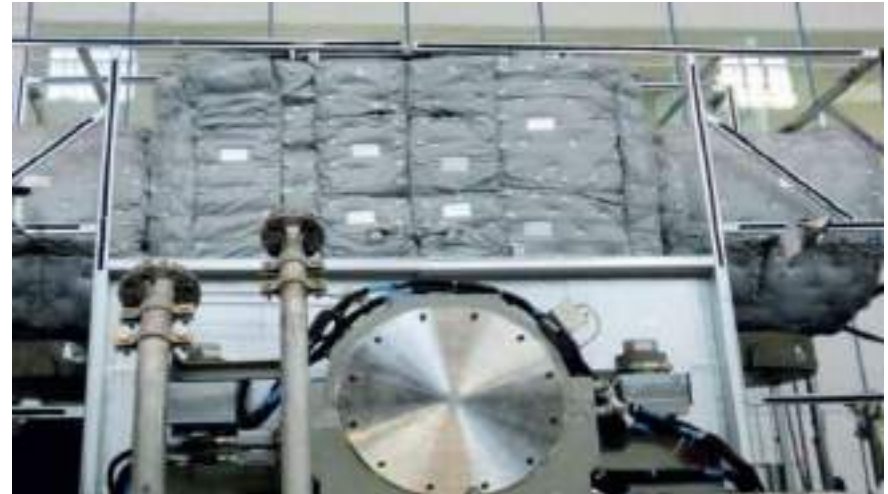
Products: Enclosure II

Technical Advantages:

- Protection of insulation pillows against mechanical effects
- Protection against oil spillage and other contamination
- Integrated heat retention shield for bearing
- Quick access for service purposes
- Protection against all kinds of environmental conditions (water, sand, wind, etc.)
- Improving optical appearance, various kinds of materials available

Plant Operator's Benefits:

- Savings on spare parts (pillows) during overhauling
- Savings on reduced outages caused by environmental conditions
- Noise reduction



Pillow insulation and enclosure's framework substructure



Completed enclosure with cover sheets and heat retention shield



Products: Spray Insulation I



Spray insulation on steam turbine



Products: Spray Insulation II

Technical Advantages:

- Very little prefabrication / engineering required and therefore very short lead time
- Absolute homogeneous insulation – no gaps and/or joints between insulation elements
- Hull of plaster with oleophobic paint / coating
- No use of adhesive compounds (no corrosion)

Plant Operator's Benefits:

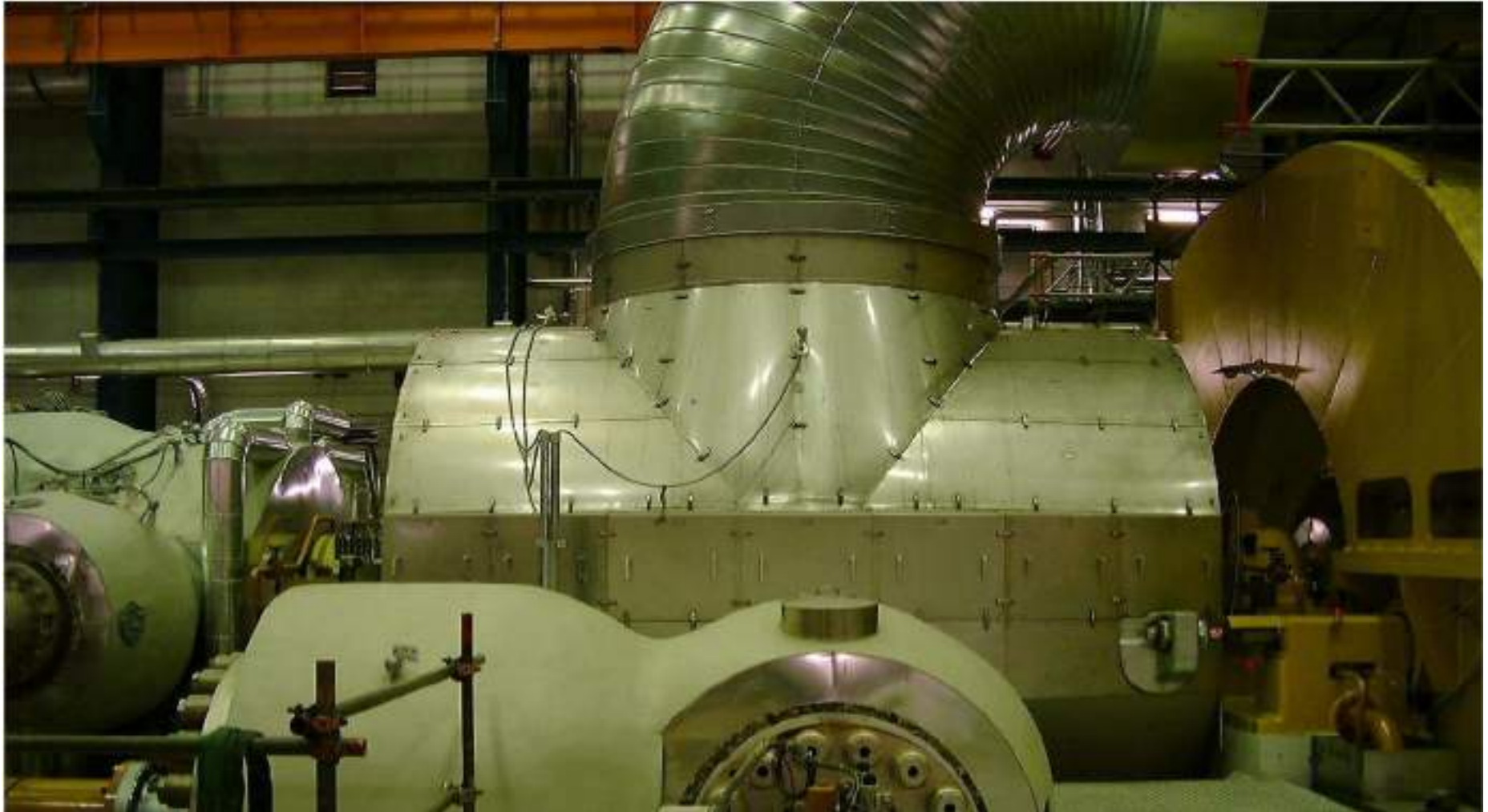
- Short-term savings
- Robust against mechanical effects
- Best economical performance for overhaul cycles greater than 10 years
- Noise reduction



Spray insulation on steam turbine



Products: Parting Joint Cassettes I



Assembled cassettes insulation for tool free access on turbine joint



Products: Parting Joint Cassettes II

Technical Advantages:

- Combined insulation setup
 - Turbine upper part: pillows + metal cover
 - Turbine joint flange: pillows + metal cover
 - Turbine bottom part: spray insulation
- Extreme fast and tool free access to turbine split joint due to metal cassettes with integrated insulation pillows
- Fast access to turbine upper part
- Long-term insulation for turbine bottom part
- Well-protected insulation (sheet metal, plaster + paint)
- Originally designed for nuclear PP

Plant Operator's Benefits:

- Savings due to reduced duration of overhauling
- Savings due to reusable insulation spare parts



Turbine joint insulation cassette



Products: Combined Heat & Noise Insulation



Fast and tool free assembled cassettes insulation system for heat and noise reduction of gas expander



Products: Noise Insulation I



Metal jacketed noise insulation of compressor



Products: Noise Insulation II



Pillow noise insulation on gas expander



Products: Noise Insulation III

Technical Advantages:

- Reduced noise emission
- Different designs available:
 - Insulation pillows
 - Wired mesh mattresses with metal cover
 - Sandwich layout of cassettes with noise absorbing and reflecting effects
- Tool-free fastener systems available

Plant Operator's Benefits:

- Complying with HSE regulations
- Reduced noise emission level
- Savings on heat loss (only combined heat insulation)



Noise insulation on industrial gear



Products: Sheet Metal Jacketing I



Sheet metal jacketing on insulated outdoor piping of petrochemical facility



Products: Sheet Metal Jacketing II

Technical Advantages:

- Achieving perfect fit and reusability by engineering and use of proper machinery
- Achieving long lifetime by using weather resistant materials according to requirement
- Cover for all kind of insulation materials (e.g. wools, fibers, foams, etc.)
- Insulation material according to application requirements (e.g. heat, cold, noise, fire protection, etc.)

Plant Operator's Benefits:

- Savings by improving process efficiency
- Savings on spare parts
- Complying with HSE regulations



Sheet metal jacketing control panel



Products: Sheet Metal Jacketing III





Products: Sheet Metal Jacketing IV





Products: Sheet Metal Jacketing V





Products: Sheet Metal Jacketing VI





Products: Sheet Metal Jacketing VII





Products: Sheet Metal Jacketing VIII





Products: Sheet Metal Jacketing IX





Products: Sheet Metal Jacketing X





Products: Sheet Metal Jacketing XI





Products: Sheet Metal Jacketing XII





Products: Sheet Metal Jacketing XIII





Logistics

100% logistics service:

- Holistic planning of logistics requirements starting in the stage of order preparation
- Design of packing according to customer's requirement/specification (e.g. seaworthy packing)
- Management of commissioning & consignment
- Batch parts systems, data transfer, customs clearance, documentation





Assembly & Field Services

Installation at plant operator's site:

- Worldwide assembly of pre-fabricated insulation components
- Single source assembly
- Well-planned packing and on-site delivery to ensure fast assembly
- Provision of supervising personnel ensuring on-time assembly meeting our quality standards
- Well-experienced assembly team:
 - Necessary Language Skills
 - Experienced abroad
 - Technical Know-How
 - Craftsmanship





Maintenance & Repairs

Serving our customers:

- Worldwide maintenance for all kind of industrial insulation components
- Quick response time to shorten overhauling
- Diagnosis-shot by experienced engineers upon request on-site or based on drawings, data sheets, files or photo documentation
- Maintenance & Repair services offered also for foreign manufactured insulation components
- Single-source for all kind of services
- Short production lead time enables quick replacements

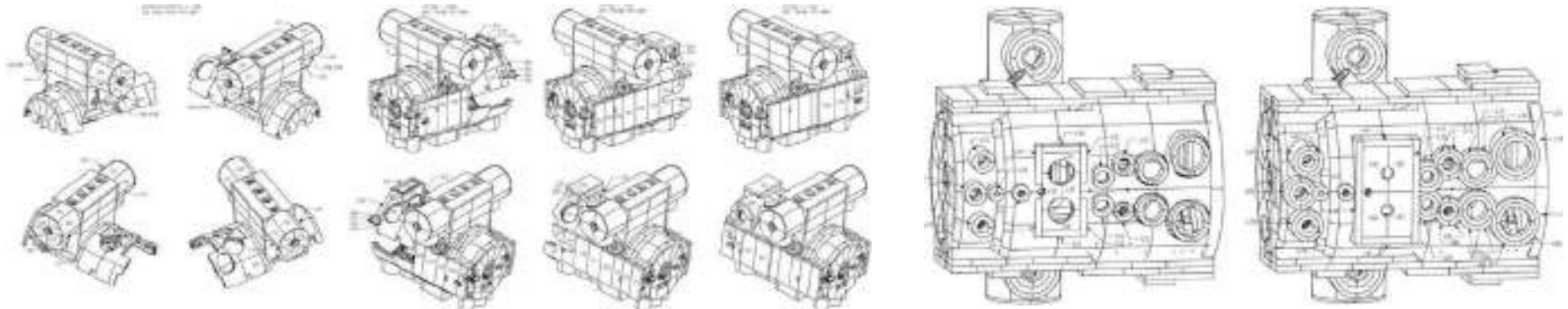
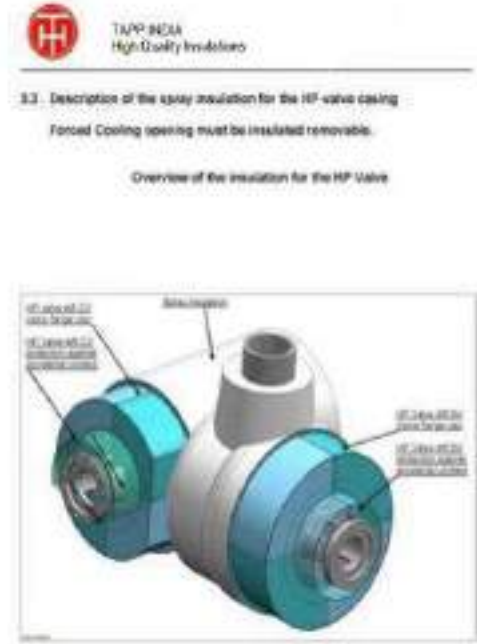




Documentation

Documenting our projects:

- Assembly documentation and manual
- Incorporation of all aspects as regards quality, HSE, assembly
- Multiple languages available
- All translations performed by native speaking translators with knowledge of the branch





Quality Management

Our services are based upon:

- Quality Management Certification according to DIN EN ISO 9001:2015
- SCC Certification as regards Security, Health and Environment
- Environmental Management Certification according to DIN EN ISO 14001





Tapp India

Increasing our manufacturing capabilities:

- Tapp India Pvt. Ltd., founded as joint venture with an Indian partner showing a long-term business relationship
- Production Area of about 35,000 sq. feet
- Administrative facilities of about 5,000 sq. feet
- Workshop approval from major turbine OEM
- Presence in a BRIC state
- Serving the Middle East, Indian, Chinese and all other Asian markets from India
- Lower shipping cost
- Faster delivery to target destinations in Asia and Gulf States





Contact

TAPP India Pvt Ltd

Phone- +91 9411111628

[Email- contact@tapp-india.com](mailto:contact@tapp-india.com)

Address:

Plot No. 2, Khasra No. 1339,

Opp. SIDCUL Sector-2, Salempur Mehdood-2,

Haridwar - 249402 Uttarakhand (India)



References Region

INDIA

- Torrent Power – Sugan: 3 sets of steam Turbines of combine cycle PP
- NTPC – Barh: 3 sets of 660MW steam Turbine
- PPGCL – Bara: 3 sets 660MW steam Turbine
- RPCL – Yeramarus: 1 set of 800MW steam Turbine
- KPCL – Bellary: 1 set of 700MW steam Turbine
- LPGCL – Lalitpur: 3 sets of 660MW steam Turbine
- NTPC – Gadarwara: 1 set of 800MW steam Turbine
- KTPS, Kothagudem: 1 set of 800MW steam Turbine
- Torrent power – Dgen: 3 sets of steam Turbines of combine cycle PP
- GSECL – Dhuvan: 1 set of steam Turbine of combine cycle PP
- Torrent power – Unosugen: 1 set of steam Turbine of combine cycle PP
- TATA Steel- Gamharia: 25 MW Turbine Jacketed Insulation
- IOCL-Panipat: Thermal Insulation for Turbine
- GRASIM Industries: Thermal Insulation (Spray Type)
- RPGCL, Suratgarh: 1 set 660 MW – Steam Turbine
- BIFPCL, Maitree: 2 sets 660 MW – Steam Turbine & TIP
- NTPC, North Karanpura: 3 sets 660 MW – Steam Turbine



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- TSGENCO, Yadadri: 5 sets 800 MW – Steam Turbine
 - MAHAGENCO, Bhusawal: 1 set 660 MW – Steam Turbine
 - UPRVUNL, Panki 1 set 660 MW – Steam Turbine