

STEAM GENERATOR DESIGN PROFILE



AVANT-GARDE ENGINEERS AND CONSULTANTS (P) LTD

(AN ISO 9001:2015 AND ISO 17020:2012 ACCREDITED ORGANISATION)

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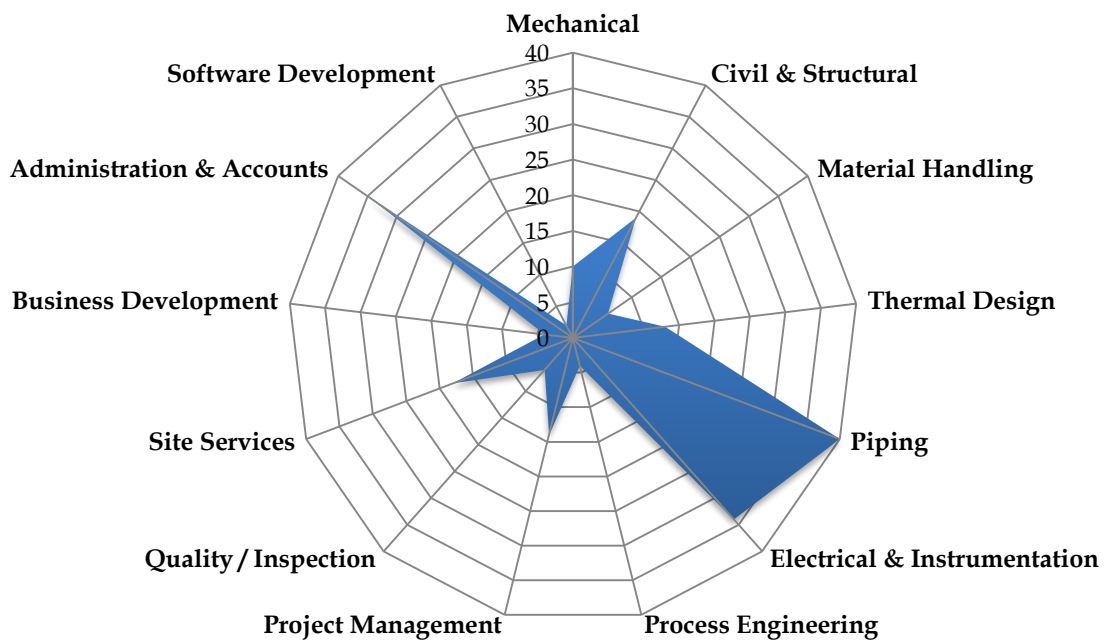


INCEPTION

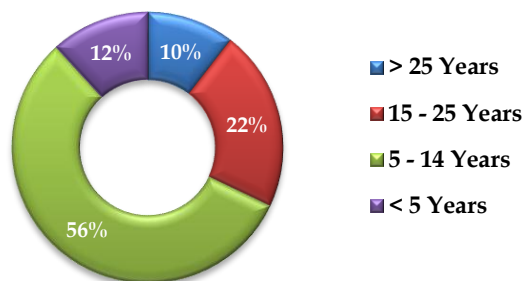
- ❖ YEAR OF ESTABLISHMENT - 1990

STAFFING

- ❖ MULTI DISCIPLINARY TEAM COMPRISE OF MORE THAN 200 WORKFORCE



YEARS OF EXPERIENCE



CONTACT PERSON

- ❖ P.S. SANKARANARAYANAN, DIRECTOR

SERVICES OFFERED FOR STEAM GENERATOR

BASIC ENGINEERING SERVICES

- Proposal engineering calculation
- Combustion calculation and efficiency calculations
- Design & Sizing of Furnace
- Furnace EPRS and FOT calculation
- Residence time calculation
- Heat load calculations (EPRS loading, Plan area loading, Volumetric loading, grate area loading, etc.,)
- Membrane wall fin temperature calculations
- Design & sizing of boiler heat transfer elements like Radiant Superheater, Convection superheater, Boiler evaporator, Economiser
- Design and sizing of Recuperative Airheater
- Arrangement of heat transfer surfaces
- Pressure drop calculations for steam and water circuit
- Pressure drop calculation for air and flue gas circuit
- Metal temperature calculations and material selection
- Boiler circulation design calculations
- Drum sizing including the drum internals
- Riser and down comer sizing
- Sizing of boiler auxiliaries like fans (ID, FD, SA & GR fans as applicable) Boiler feed pumps, Dust collector (ESP, MDC, wet scrubber, etc.), Boiler grate (Travelling grate, dump grate, etc.), soot blowers, etc.,
- Part load calculations, Multi-fuel combination calculations, etc.,
- Fuel system calculations and design
- OFA design and calculations
- Ducting sizing including stiffener design
- 2Boiler structure design calculations
- BOM preparation for pressure parts and non pressure parts
- Strength calculation as per IBR, ASME, etc.,
- P & I diagrams, control logics, interlock etc., for boiler control
- Chimney sizing

DETAILED ENGINEERING SERVICES

- Boiler layout and arrangement drawings
- Equipment layout
- Boiler structural arrangement and detailed fabrication drawings
- Boiler floor wise detail drawing preparation
- Civil foundation design for boiler column and boiler auxiliaries
- Boiler pressure part arrangement and detailed drawings
- Boiler part assembly drawing
- Buck stay design and detailed fabrication drawings
- Boiler support rod design and detailed fabrication drawing
- Detailed fabrication drawings for pressure parts
- Code calculations for structures, pressure parts and non pressure parts
- Fuel system arrangement and detailed drawings

- Air and flue gas ducting arrangement and fabrication drawings
- Airheater assembly and fabrication drawings
- Insulation and refractory drawings
- Chimney detailed fabrication drawings
- Instrumentation control system engineering
- Preparation of valve schedules, instrumentation schedules etc
- Electrical system engineering
- Operating and maintenance manuals
- Erection guidance for steam generator and auxiliaries

BALANCE OF PIPING (BOP) ENGINEERING SERVICES

- Vendor rating
- Preparation of Specification for bought out items
- Evaluation of offers received
- Preparation of Draft Purchase Order
- Vendor Drawing Review

BOILER INTEGRAL AND EXTERNAL PIPING DESIGN AND ENGINEERING SERVICES

- Boiler feed water piping up to economiser inlet
- Piping from economiser inlet to steam drum
- Saturated steam piping from steam drum to primary superheater header
- Inter stage de-superheater piping
- Main steam piping from Superheater header outlet
- Soot blower piping
- Drains and vent piping
- Blow down piping
- Sample cooler piping
- Preparation of MDC for tanks and vessels

OTHER SERVICES

- Project Engineering and Co-Ordination Services
- Inspection Services
- Supervision of Erection and Commissioning
- Performance Testing Services

AVANT-GARDE'S EXPERIENCE IN BOILER / BOILER SYSTEM COMPONENT, DUCTING DESIGN AND ENGINEERING SERVICES

S. No	Project	Client
1	Design and engineering of 700kg/hr oil fired boiler	Uttam Industrial Engg. (P) Ltd., Ghaziabad, U.P
2	Design and engineering of husk fired FBC boiler of 1.0 TPH capacity	Binny Ltd., Engg. Division, Chennai
3	Design and engineering of waste heat boiler high temperature ducting system, feed water and steam piping system, feed water heater	Ergodyne P. Ltd, Chennai.

S. No	Project	Client
	and desuperheater equipment design for sponge iron plant.	
4	Design of waste heat recovery steam generator for 4 x 100000 TPA Sponge Iron Plant.	Jindal Strips Ltd., Hisar
5	Thermal design and Pressure part drawings for FBC boiler	Laxmi Boilers (South) Pvt. Ltd., Bangalore
6	Development of standard FBC boiler designs from 2 TPH to 10 TPH for coal / husk firing	Nestler Boilers (P) Ltd., Bombay
7	Thermal and mechanical design of a contact type 15TPH capacity deaerator for boiler feed water	I.A.E.C. Pumps Ltd., Chennai
8	Review of detailed engg. & manufacturing drawings Machinery and of pressure parts circulation calculations for 8.0TPH Chemical recovery Boiler	Thunghabadra Manufacturing and Tools Ltd., Hyderabad
9	Design & detailed engg. of 22TPH blast furnace gas fired boiler for Usha Ispat Limited	I.A.E.C Boilers (P) Ltd., Madras
10	Conversion of coal fired boiler to pith / bagasse fired boiler	Shree Vindhya Paper Mills Ltd., Bhusawal
11	Feasibility study for burning pith in FBC Boiler	Rohit Pulp & Mills Ltd, Udwarda
12	Detailed engineering of Boiler system components for BFG boilers	Blacke-Durr Kaveri, Bangalore
13	Revamping of multitherm boiler.	Vantech Pesticides Ltd., Hyderabad
14	Design and detailed engineering of 40TPH, 42kg/cm ² (g), 410°C, FO / LSHS / NG fired Boiler	ATV Projects India Ltd., Bombay.
15	Detailed engineering of pressure parts, fuel system ducting etc. for palm oil shell / fibre fired 21TPH boiler	Thermodyne Technologies (P) Ltd., Madras
16	Detailed engineering services for oil fired boiler and chimney for Kellogg India Limited.	IAEC Industries Ltd, Madras
17	Detailed engineering of 3TPH boiler for Jindal Photo Films Ltd.	IAEC Industries Ltd, Madras
18	Design and detailed engineering of 32TPH, 32kg/cm ² (g) Sat temp. palm waste fired boiler	Thermodyne Technologies (P) Ltd.
19	Detailed engineering of 22TPH, 22.5kg/cm ² (g), 250°C Palm oil shell fired boiler.	Thermodyne Techno-logies (P) Ltd

S. No	Project	Client
20	Design and engineering of furnace modifications for up-gradation of 19TPH boiler to 25TPH bagasse fired boiler	SMC Thermal (P) Ltd., Kanpur
21	Design and detailed engineering of 35TPH, 45kg/cm ² (g) 440°C bagasse fired boiler for Kallakurichi Co-op. Sugar Mills Limited	Binny Ltd., Engineering Divn. Chennai
22	Design and Detailed engineering of 55 TPH, 45kg/cm ² (g) 440°C bagasse fired boiler for NPKRR Co-op. Sugar Mills Limited	Binny Ltd., Engg Divn, Chennai
23	Engineering assistance for review of boiler calculation for conversation of 70TPH to 9 TPH boiler	Gujarat Heavy Chemicals Ltd.,
24	Boiler and piping design for 35TPH, 66kg/cm ² (g), 480° C	The KCP Ltd., Chennai
25	Boiler and piping design for 70 TPH 66kg/cm ² (g), 485°C bagasse fired boiler	The KCP Ltd Chennai
26	Capacity up-gradation of 2 nos. of 45TPH, 21kg/cm ² (g) 380° C and introduction of economiser and dust collector in 20 TPH Boiler	Sri Chamundeswari Sugar Mills Ltd
27	Design and detailed engineering of 45TPH, 42kg/cm ² (g), 400°C oil fired boiler	IAEC Boilers Ltd.,
28	WRHSG design and engineering for GTG for Assam	DLF Industries Ltd
29	Basic and detailed engineering for 27 TPH FBC Boiler	DLF Industries Ltd
30	Detailed engineering of 40TPH, 42kg/cm ² (g), 480°C bagasse fired boiler	Thermodyne, Chennai
31	Detailed engineering of piping for 1 x 25TPH, 27.5kg/cm ² (g) 360°C bagasse fired boiler	Fives Cail KCP Ltd.,
32	Detailed engineering of 15TPH, 32kg/cm ² (g), 380°C bagasse fired boiler	Thermodyne, Chennai
33	40 TPH, 46kg/cm ² (g) 420°C bagasse fired boiler design and detailed engineering	Fives Cail KCP Ltd.,Chennai
34	Consultancy and detailed engineering services for rehabilitation of 12TPH oil and fired boilers	SWIL, Nasik
35	Design and engineering of 1 x 30 TPH, 17.8 kg/cm ² (g) 350°C Boiler	Fives Cail KCP Ltd.,
36	Consultancy and detailed engineering services for WHRSG system and power generation	GMR Vasavi Power Corp.

S. No	Project	Client
37	Design and detailed engineering of 2 x 100TPH, 42kg/cm ² (g) 2, 405 Deg C bagasse fired boilers	KCP Sugar & Industries Corpn. Ltd
38	Performance design and piping engineering for 70 TPH HUE boiler	Fives Cail KCP Ltd.,
39	Proposal engg. Of 70 TPH oil fired boiler 70 TPH, 43 ata, 415°C	Krupp Industries, Ltd., Pune
40	Design and detailed engineering of 1 x 105 TPH, 66kg/cm ² (g) , 485°C Bagasse fired boiler (A/c. Ugar Sugars)	Krupp Industries, Ltd., Pune
41	Design and detailed engineering of 1 x 100 TPH, 66kg/cm ² (g), 485°C Bagasse fired boiler (A/c. Jeypore Sugars)	Fives Cail - KCP Ltd.,
42	Design and detailed engineering of 110TPH, 110ata, 540°C bagasse / imported coal / Neyveli Lignite fired Boiler (A/c. Rajshree sugars Ltd.)	Fives Cail - KCP Ltd.,
43	Design and detailed engineering of 110TPH, 110ata, 540°C bagasse / imported coal fired Boiler (A/c. Dharani Sugars Ltd.)	Fives Cail - KCP Ltd.,
44	Design and detailed engineering of 135TPH, 110ata, 540°C bagasse fired boiler (A/c. SCM Sugars Ltd)	Fives Cail - KCP Ltd.,
45	Design and detailed engineering of 110TPH, 110ata, 540°C bagasse / Indian coal / Imported coal fired boiler (A/c. Krishnaveni Sugars Ltd)	Fives Cail - KCP Ltd.,
46	Design and detailed engineering of 110TPH, 110ata, 540°C bagasse / Indian coal / Imported coal fired boiler (A/c. Sirikuppa Sugars Ltd)	Fives Cail - KCP Ltd.,
47	Design and detailed engineering of 110TPH, 110ata, 540°C bagasse / Indian coal / Imported coal fired boiler (A/c. Hemarus Sugars Ltd)	Greenesol Power Systems Private Limited
48	Design and detailed engineering of 2 x 110TPH, 32ata, 420°C bagasse / Oil fired bi-drum boiler (A/c. Finchaa, Ethiopia)	Fives Cail - KCP Ltd.,
49	Design and detailed engineering of 4 x 200TPH, 26/45ata, 360/420°C bagasse / Oil fired bi-drum boiler (TRR Sugars, Thailand)	Veasons Energy & System Pvt. Ltd
50	Design and detailed engineering of 1 x 130TPH, 125 ata, 545°C bagasse / Coal fired boiler (A/c.Madras Sugars Limited)	Greenesol Power Systems Private Limited

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51	Design and detailed engineering of 1 x 135TPH, 110 ata, 540°C bagasse / Coal fired boiler (A/c.Jaimahesh)	Fives Cail - KCP Ltd.,
52	Modification & revamping of 90 TPH, 62 ata, 496°C bagasse / Coal fired boiler	Jamkhandi Sugars
53	Detailed engineering for 10 MW Cement plant waste heat recovery boiler based on kalian cycle (D.G.Khan Cement, Pakistan)	FLSmidth Ltd
54	Ducting design and detailed engineering of 1 x 45TPH TG 67 ata , 485°C fuel: 100% Julia flora, 100% wood chips (Singaraya Hills Green Power)	Greenesol Power Systems Pvt. Ltd
55	Ducting design and detailed engineering of 1 x 130TPH CFBC 67 ata, 485°C fuel: 50% Indian coal, 30% WR & 20% coal char (Adhunik Metaliks)	Greenesol Power Systems Pvt. Ltd
56	Ducting design and detailed engineering of 2 x 160TPH CFBC 106 bar(a), 540°C fuel: Indian coal, imported coal & pet coke 60% (Penna Cement)	Greenesol Power Systems Pvt. Ltd
57	Ducting design and detailed engineering of 1 x 260TPH 260TPH CFBC 101 kg/cm ² , 540°C fuel: kutch lignite, coal pet coke 50% (Sanghi Industries)	Greenesol Power Systems Pvt. Ltd
58	Ducting design and detailed engineering of 1 x 250 CFBC 110 ata, 540°C fuel: coal, Washery rejects (S.V.Power)	Greenesol Power Systems Pvt. Ltd
59	Ducting design and detailed engineering of 3 x 30 MW, 74 bar(a), 490°C fuel: Indian coal (Utkal Alumina)	Greenesol Power Systems Pvt. Ltd
60	Ducting design and detailed engineering of 1 x 130 TPH CFBC 117.3 ata, 540°C fuel: 100% Indian coal, dolo char, ESP ash, SA coal, biomass (BMM Ispat)	Greenesol Power Systems Pvt. Ltd
61	Ducting design and detail engineering of 2 x 275 TPH CFBC, 117.3 ata, 545°C fuel: Indian coal, dolo char and biomass (BMM Ispat)	Greenesol Power Systems Pvt. Ltd
62	Ducting Desing and detail engineering of 8.5 MW Cement Plant Waste Heat Revocery Boiler (Vikat Sagar)	FLSmidth Ltd
63	Design and detailed engineering of 30 TPH SLOP fired boiler (A/c.Rajshree Sugars Ltd)	Fives Cail – KCP Ltd

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64	Design and detailed engineering of 1 X 130 TPH, 110 ata, 545°C Bagasse / Coal fired boiler (A/c. Basaveshwar Sugars)	Fives Cail – KCP Ltd
65	Design and Detailed Engineering of 60 TPH, 67 ata, 435°C Boiler. Fuel: Biomass	Areva Bio Energy India (P) Ltd
66	Design and Detailed Engineering of 80 TPH, 87 ata, 520°C Coal Fired AFBC Boiler	The KCP Ltd
67	Design and Detailed Engineering of 150 TPH, 64.68 kg/cm ² (g), 490°C Bagasse / Coal / Natural Gas Fired Boiler	Uttam International FZE
68	Design and Detailed Engineering Services for 110 TPH, 110 ata, 540°C Travelling Grate Boiler (A/c. Fabtech Sugar)	Fabtech Projects & Engineers Ltd
69	Design and Detailed Engineering Services for 155 TPH, 110 ata, 540°C Bagasse cum Coal fired boiler and associated Piping Engineering (A/c. Chiniot Power Ltd)	Greenesol Power Systems Pvt Ltd
70	Design and detailed engineering of 22 TPH SLOP fired boiler (A/c. Jamkhandi Sugars)	Fives Cail – KCP Ltd
71	Design and detailed engineering of 23 TPH SLOP fired boiler (A/c. V.V.Sugars, Perambalur.)	Fives Cail – KCP Ltd
72	Design and detailed engineering of 20 TPH SLOP fired boiler (A/c. United Sprits)	Fives Cail – KCP Ltd
73	Design and detailed engineering services of 22 TPH Slop Fired Boiler (A/c. Jamkhandi)	Fives Cail - KCP Ltd
74	Detailed and detailed engineering services of 45 TPH SLOP Fired Boiler (A/c. Babhnan Mills)	Fives Cail - KCP Ltd
75	Detailed and detailed engineering services of 45 TPH SLOP Fired Boiler (A/c. Mankapur)	Fives Cail - KCP Ltd
76	Design and detailed engineering services of 24 TPH, 45 ata, 400°C Slop Fired Boiler (A/c. Gem Sugars)	Fives Cail - KCP Ltd
77	Design and detailed engineering services of 35 TPH Slop Fired Boiler (A/c. Athani)	Fives Cail - KCP Ltd

OTHER SERVICES PROVIDED BY AVANT-GARDE FOR STEAM GENERATOR IN VARIOUS PLANTS

- Boiler performance improvement and Capacity Up-gradation.
- Power plant Technical audit and Energy audits
- RLA study for boilers.
- Complete Sugar Plant Process Piping.

- Trouble Shooting in Boiler & TG area.
- Excess power export to grid.
- Up-gradation of control systems and introduction of interlocks and controls.
- Modification and revamping of fuel system
- Waste heat recovery system design and engineering for boilers

CONTINUOUS BAGASSE FEED SYSTEM FOR SUGAR PLANT BOILERS

Cogeneration plants using high pressure modern boilers and TG working in parallel with the grid, require continuous bagasse feed for the boiler to maintain the steam pressure constant irrespective of minor interruptions/ stoppages in sugar mill. Avant-Garde have successfully developed (pending patent) a continuous bagasse feed system which is working in the following sugar mills.

1. M.R.K.Co-operative Sugar Mills Ltd, Tamil Nadu
2. Cheyyar Co-operative Sugar Mills Ltd, Tamil Nadu
3. EID Parry (I) Ltd, Tamil Nadu
4. Thiru Arooran Sugars Limited, Unit-I, Tamil Nadu
5. Arunachalam Sugar Mills Ltd., Tamil Nadu
6. Supreme Renewable Energy Ltd., Tamil Nadu
7. Auro Energy Limited., Tamil
8. TNPL Offsite at Sakthi Sugars Ltd., Tamil Nadu
9. Rajshree Sugars and Chemicals Ltd., Mundiyampakkam, Tamil Nadu
10. Terra Energy Limited., Thirumankankudi, Tamil Nadu
11. EID Parry (I) Ltd., Pudukottai, Tamil Nadu
12. EID Parry (I) Ltd., Pugalur, Tamil Nadu
13. EID Parry (I) Ltd., Pettaivaithalai, Tamil Nadu
14. Fives Cail-KCP Ltd., Tamil Nadu (Jeypore Sugar Co. Ltd.,Unit - II)
15. Rajshree Sugars and Chemicals Ltd., Gingee, Tamil Nadu
16. KCP Sugar and Industries Corpn. Ltd., Andhra Pradesh
17. KCP Mayura Sugars Limited, Andhra Pradesh
18. The KCP Limited, Lakshmipuram, Andhra Pradesh
19. Ganpati Sugar Industries Ltd., Andhra Pradesh
20. Varalakshmi Sugars Ltd., Andhra Pradesh
21. Sagar Sugars & Allied Products Ltd., Andhra Pradesh
22. Kakatiya Cement, Sugar and Industries Ltd., Andhra Pradesh
23. Nizam Deccan Sugars ., Andhra Pradesh
24. The Jeypore Sugar Company Ltd., Andhra Pradesh
25. Nava Bharat Ventures Ltd., Andhra Pradesh
26. GSR Sugars Limited., Andhra Pradesh
27. Shri Prabhulingeshwar Sugar Works Ltd., Karnataka
28. Gem Sugars Ltd., Karnataka
29. Bannari Amman Sugars Ltd., 80 TPH boiler, Karnataka
30. The Mysore Sugar Company Ltd., Karnataka
31. Bannari Amman Sugars Ltd., (120 TPH boiler), Karnataka
32. Shree Doodhaganga Krishna SSKN., Karnataka
33. Shree Renuka Sugars Ltd., Athani, Karnataka
34. Shree Renuka Sugars Ltd., Manouli, Karnataka

35. Triveni Engineering and Industries Ltd., Deoband, U.P
36. Akbarpur Chini Mills Ltd., U.P
37. Mankapur Chini Mills Ltd., U.P
38. Agauta Sugars Limited, Uttar Pradesh
39. Haidergarh Chini Mills Ltd., Uttar Pradesh
40. Triveni Engineering and Industries Ltd., Khatauli, U.P
41. Rauzagaon Chini Mills, Uttar Pradesh
42. Tikaula Sugar Mills Ltd., Uttar Pradesh
43. Chilwaria Sugars, Uttar Pradesh
44. Upper Ganges Sugar Industries Ltd., Uttarpradesh
45. Ramgarh Chini Mills Ltd, U.P
46. Baghauri Sugars Ltd., U.P.
47. KCP Vietnam Industries Ltd., Vietnam
48. Aldebran Energia Del Gaudalquivir S.L.Spain
49. Mumias Sugar Company Ltd., Kenya
50. Lopez Sugar Corporation, Philippines

OTHER AREAS OF SPECIALISATION

- Stress Analysis
- Waste Heat Recovery
- Power & Process Piping
- Plant Layout
- Power Plant Heat Balance
- Energy Conservation
- Detailed Engineering in various disciplines

GROUP COMPANY

- Avant-Garde Systems and Controls (P) Limited, Chennai.
- Avant-Garde Engineers & Consultants FZC, Sharjah, U.A.E

AFFILIATIONS & MEMBERSHIP

- CEAI - Consulting Engineers Association of India (CEAI is member of **FIDIC International Federation of Consulting Engineers**)
- Consultancy Development Centre (CDC)
- Registered with Indian Renewable Energy Development Agency (IREDA)
- Enlisted with Power Finance Corporation of India and Asian Development Bank
- IIT, Chennai - Industrial Associateship Scheme (IAS) Membership and Library Membership
- Anna University - Industrial Associateship Scheme (IAS) Membership and Library Membership
- BIS - Bureau of Indian Standards Library Membership
- Institute of Engineers Fellow Membership - Directors (Chartered Engineers)
- Indian Chamber of Commerce and Industry (ICCI)

- Madras Chamber of Commerce and Industry (MCCI)
- Indian Wind Power Association
- Indian Welding Society
- Institute of Fire Engineers
- Bureau of Energy Efficiency (BEE)
- Maharashtra Energy Development Agency
- South Indian Sugarcane and Sugar Technologists Association
- Sugar Technologist Association of India (STAI)
- Engineering Export Promotion Council (EEPC)

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