



SUSTAINABLE SOLUTIONS FOR THE
FOOD & BEVERAGES
INDUSTRY



CONSERVING RESOURCES, PRESERVING THE FUTURE.



Thermax is an engineering company providing sustainable solutions in energy and the environment. The company's vision for the future is firmly anchored in the belief that to stay competitive, companies need to adopt sustainable development practices. The systems, products, and services developed by Thermax enhance resource productivity, improve bottom lines, and maintain a clean environment. Even as we convert costs to profits, we help to protect the environment through our sustainability initiatives - a win-win for the industry and the society at large.

Thermax's business portfolio offers integrated solutions for **Clean Air, Clean Energy and Clean Water.**

Business Solutions

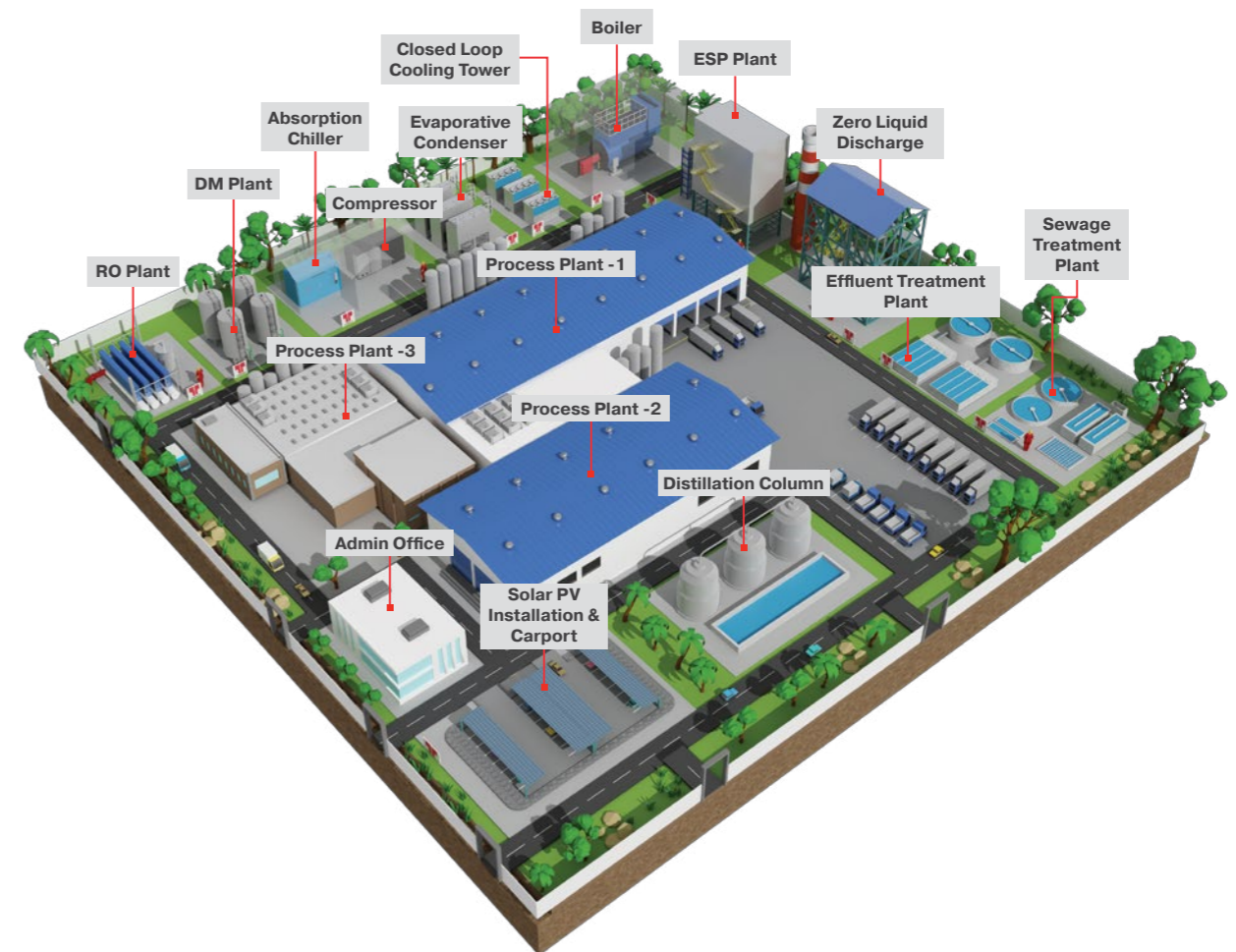


With its host of business solutions complemented with an array of specialised and digital services, Thermax is well poised to cater to the end-to-end needs of the industry.

MEETING SUSTAINABILITY AND UTILITY DEMANDS

Thermax's solutions for the Food & Beverages industry

The demand for fresh, organic produce is increasing globally. The F&B industry is embracing new technologies that encourage the use of fresh and local ingredients, while minimising wastage. The industry is drafting its own sustainability strategy around 'grow-protect-manage'. Players across the value chain are taking cognisance of climate change and its resultant impact on our lives and are therefore adopting green, sustainable processes driven by regulatory compliances, eco-conscious consumers and changing consumption patterns. Thermax, with its sustainable offerings, aids the F&B industry meet their utility needs as well as reaching their sustainability goals, while reducing their carbon footprint.



Safe and compliant solutions for the industry



O&M

Our experienced and trained team delivers comprehensive operation and maintenance services and deploys proprietary processes. Our services include operation and maintenance of power plants, utilities, plant improvement services, and maintenance solutions.



Digital Solutions

To provide value-added services to its customers, Thermax has introduced Thermax Edge – an all-inclusive customer portal to address all asset lifecycle needs, and Thermax Edge Live – an asset performance enhancement solution powered with AI, ML and Thermax engineered algorithms, enabling improved plant performance, enhanced uptime and knowledge management.

Heating Solutions

Heating sustainably

Multi-fuel, fully automated heating, steam generation and distribution systems

The F&B industry worldwide is looking for the right mix of energy sources for its process heating requirements. Thermax, as a proven leader in the segment, has solutions that can be customised for the industry.

Thermax's comprehensive range of steam accessories coupled with high engineering expertise, in heating solutions, help the F&B industry combat a variety of challenges such as increasing energy and water costs, reduced operating efficiency and stringent health, safety and environmental norms.



Applications

Heating

- ▶ Direct and indirect heat utilisation from the steam, thermic fluid, and hot air coming from the process heating equipment like frying, roasting, steaming, cooking, drying, etc.
- ▶ Auxiliary heat required at various other stages of the process.
- ▶ Heat in the form of steam is used in brewing processes such as mashing of milled malt, wort extraction, boiling etc.
- ▶ Steam for pasteurisation of brew, milk and bottle cleaning, bottling etc.
- ▶ The heat required to make milk products like ghee, cheese etc.
- ▶ The heat required for vapour absorption chillers for process cooling and chilling requirements

Steam

- ▶ Steam generation and distribution to plant processes
- ▶ Condensate recovery after the chemical processes

Thermax Offerings

Process Heating

- ▶ Solid fuel, oil & gas fired steam boilers
- ▶ Thermic fluid heaters and hot air/water heaters
- ▶ Energy plant and heat recovery boilers
- ▶ Boiler health check-up, audits, O&M and retrofit/revamp

Steam Engineering




- ▶ Pressure reducing station in boiler house
- ▶ Surface automatic blowdown control system in boiler house
- ▶ Effimonitor – an online boiler efficiency monitoring system
- ▶ Thermax Condensate Recovery Systems (TCRS)
- ▶ Steam traps and modules
- ▶ Energy audits and utility piping consultancy services

Benefits

Heating

-  Operates on a wide range of fuels including coal, oil & gas, and biomass
-  High efficiency: Complete range of products that offer high efficiency
-  Low footprint: Compact skid mounted modular process heating solutions
-  Low maintenance: Quality heating products and solutions that ensure low maintenance and downtime
-  Project execution capabilities: Dedicated project management teams for different range of solutions and capacities ensuring smooth and hassle-free execution

Steam Engineering

-  Improving production output, efficiency, and profitability
-  Reducing energy, water consumption, and maintenance downtime
-  Meeting statutory rules, regulations, industry standards, health, and safety requirements

Case Study

Case:

A food and beverages MNC was looking for expansion with a cost-effective fuel solution and was keen to have a 100% biomass-fired unit. The three main challenges were achieving an uninterrupted steam supply, fast response to fluctuating load and high efficiency.

Solution:

Thermax offered CPRG 140 - 14 TPH boiler with a Lambion reciprocating grate, to meet the high-pressure steam requirements of the food industry for frying chips and noodles in high-pressure steam.

Result:

The solution helped the company achieve process efficiency with just 3-4 people managing the plant operations. The ash content lowered to 15%, while the SPM level reduced to 28 PPM.




Why choose Thermax solutions?

- ▶ Operational reliability: As pioneers of process heating solutions in India, Thermax continually utilises the experience gained to offer reliable process heating products and solutions to the users
- ▶ Ease of operation: Solutions developed and improved over the last five decades ensure ease of operation of the equipment
- ▶ Service reliability: Dedicated teams with extensive reach through its service offices in 27 countries
- ▶ Thermax steam engineering offers innovative services and solutions in energy efficiency
- ▶ Plant improvement through engineering studies and remote monitoring systems

 **38+** countries

 **60+** years of expertise

 **150+** solid, liquid and gaseous fuel firing options

 **30k+** successful installations

Cooling Solutions

Energy-efficient, reliable, and customised cooling solutions

Sustainable solutions for process and comfort cooling, and preservation






Cooling and heating systems (dryers, ovens, furnaces, and refrigeration units) have the highest energy requirements in food manufacturing facilities. Thermax's absorption cooling and heating technologies serve as the right solution for the energy challenges faced by the industry. Vapour absorption machines are electricity-free cooling and heating units with very low operational costs, thus reducing the industry's dependency on grid power. They also come with the potential to run on heat recovered from the facility's existing processes or utilities, thereby reducing greenhouse gas emissions to a sustainable level.

Our tailored solutions in process cooling applications play a critical role in reducing energy costs, making processes environment-friendly and ensuring optimal storage temperature.








Benefits

Absorption Cooling

-  Heat recovery from engines, turbines, and furnace
-  80% savings in electricity consumption
-  25% savings in operational cost
-  Wide range of operation from -40°C to 180°C
-  Better resource productivity while maintaining a cleaner environment

Process Cooling

-  Zero water wastage, low operating cost and negligible maintenance cost
-  Plug and play units occupying less space and eliminating scaling issues
-  Potential to integrate into existing free cooling systems
-  Independent of the ambient conditions
-  Minimises potential contamination of the process through a closed-loop water circuit



Why choose Thermax solutions?

- ▶ Low steam consumption with no vibrating parts
- ▶ Eliminates microbial concerns
- ▶ No harmful refrigerants and no requirement for lithium bromide / demineralised water top-up
- ▶ Optimum utilisation of the waste heat from the process exhaust
- ▶ Better resource productivity while maintaining a cleaner environment
- ▶ Crystallisation-free design with 24x7 IoT-based chiller monitoring

Applications

Absorption Cooling

- ▶ Beverage cooling before bottling
- ▶ Primary cooling in pasteurisation and cold storage for milk
- ▶ Humidity and temperature control in food production and storage area to reduce bacteria load
- ▶ Quick freezing / cooling of pre-cooked frozen foods or bottles

Process Cooling

- ▶ Intermediate cooling
- ▶ Refrigeration condensation
- ▶ Primary and secondary condenser of distillation column

Thermax Offerings

Absorption Cooling and Heating Solutions

- ▶ Hot water driven chillers (80°C-220°C)
- ▶ Steam driven chillers (steam pressure: 0 - 25 bar)
- ▶ Direct fired absorption chillers (fuels - CNG, LNG, HSD, biofuels etc.)
- ▶ Multi-energy (steam/hot water) / exhaust fired absorption chiller
- ▶ Chiller-heater (only heating/only cooling/ simultaneous heating and cooling)
- ▶ Ultra low-pressure vapour driven chiller
- ▶ Heat pump (60°C - 220°C)
- ▶ Sub-zero glycol free chillers

Process Cooling Solutions

- ▶ Closed loop cooling tower
- ▶ Evaporative condensers
- ▶ Adiabatic cooler / dry cooler

Case Study

Case:

A dairy major wanted to reduce the energy consumed for refrigeration by the milk processing plant (about 40%).

Solution:

Thermax's hybrid absorption chiller-heater solution cools the milk instantly from 35°C to 3.5°C as against a conventional bulk milk cooler, which takes 4.5 hours. The same machine can be used to generate hot water for cleaning in place (CIP), hence eliminating the need for a separate hot water generation system. The chiller setup commissioned to the customer led to higher overall system efficiency and gave flexibility as the same could be used for 5 KL and 10 KL bulk milk cooling.

Result:

The solution resulted in power savings of 50% with a reduced footprint, enabling the customer to achieve overall energy savings of more than 80%.

 **50+**
industries served

 **90+**
countries

 **100+**
applications

 **6,300+**
successful installations

Projects and Energy Solutions

Providing dependable and uninterrupted power supply

Cost-efficient and state-of-the-art power generation solutions



The F&B segment has multi-layer energy requirements starting from heating, cooling, and powering the electrical equipment, including lighting, UPS and related infrastructure.

Thermax, with its decades of expertise, aids entities in setting up captive power plants to meet the energy requirements of the F&B industry. The cost-effective power solutions, including cogeneration and trigeneration power plants, empowered with digital and IoT solutions, deliver a seamless experience. As a trusted EPC company in the power generation space, we maintain high standards in operations and maintenance to satisfy our customers.







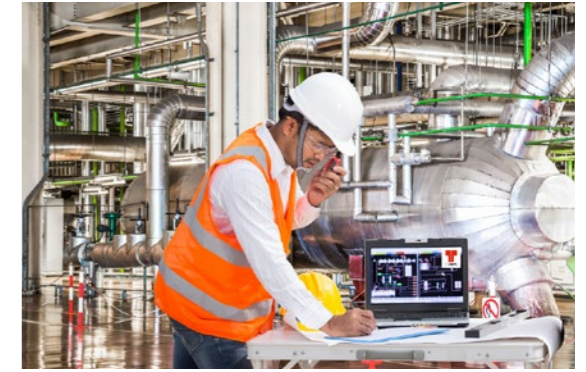
Benefits

EPC

-  Improvement in energy efficiency on the generation and consumption sides
-  24x7 availability of utilities like steam, power, treated and chilled water, compressed air, nitrogen, etc.

Operations & Maintenance

-  Only O&M company with EPC background
-  High uptime, reliability, and enhanced equipment life
-  Digital and IoT-enabled solutions
-  Energy savings



Why choose Thermax solutions?

- ▶ 25 years of EPC experience in captive cogen plants
- ▶ O&M efficient and reliable services for power plants, in a safe and compliant environment
- ▶ Experienced and qualified team provides comprehensive operation and maintenance services
- ▶ Using unique procedures that ensure high uptime, reliability, and enhanced equipment
- ▶ One-stop solution for operation and maintenance of utility equipment
- ▶ The expert team ensures utilities like power, steam, compressed air, water, etc. are available 24x7

Applications

- ▶ Power and electricity requirement of the food and beverages plant
- ▶ Operation and maintenance of power plant and utility blocks like boilers, WTP / ETP, compressors, electrical systems, etc.

Thermax Offerings

- Operation and Maintenance of Utilities**
 - ▶ O&M support that ensures 24x7 assistance for power and utility requirements
- Efficiency Management Services**
 - ▶ Annual maintenance contract of mechanical, electrical and C&I
 - ▶ Shutdown and annual overhauling services for the turbine, boiler, ESP, CHP, AHP, fans, pumps, etc.
 - ▶ Optimised end-to-end solutions to improve the energy efficiency of the plant

Case Study

Case:


As part of their grain based distillery project, a biochemical major located in Dhanbad, Jharkhand, wanted to expand its existing plant capacity from 120 KLPD to 200 KLPD and its cogeneration power plant capacity from 2.2 MW to 9.8 MW.

Solution:

Thermax supplied a 9.8 MW cogeneration plant on EPC basis. The revised total DM water requirement was 37.25 m³/hr. We offered a solution to change the existing mix bed unit to deliver 40 m³/hr of DM against the existing 25 m³/hr. Also, installation of an ultrafiltration unit of capacity 31 m³/hr along with required pumps and motors was suggested.


Result:

The DM water requirement of 28 m³/hr was achieved without installing a new DM plant. This resulted in installation savings of approximately Rs. 1 crore for the customer.

 **150+** projects cumulating to over 3,500 MWe contracted on EPC basis

 **2,000+** MW cumulative O&M experience

 **100+** plants under O&M services

 **360°** approach in clean energy management



Renewable Energy Solutions

Offering customised power solutions to the F&B industry

Round-the-clock clean energy supply

The F&B industry is making a collective effort involving the entire value chain in its pursuit to make sustainability mainstream.

Our renewable energy portfolio that includes hybrid solutions based on solar and storage batteries provide an uninterrupted green power supply to the F&B industry, thereby keeping all of its critical processes seamless. The renewable energy solutions from Thermax are thus also facilitating the companies in the F&B domain to trace their energy transition journey, while considerably reducing the carbon emissions.



Applications

Solar

- ▶ Power requirement of the F&B industry
- ▶ Operation and maintenance of the solar PV plant









Thermax Offerings

- ▶ Rooftop, ground mounted, carport solutions
- ▶ Developing renewable energy power projects
- ▶ Build and operate bespoke and flexible energy assets

O&M

- ▶ Round-the-clock power
- ▶ OHSAS 45001:2018 certified sites
- ▶ Dedicated O&M team and nationwide service support

Benefits

-  Carbon footprint reduction
-  Customised off-grid and on-grid solutions
-  Innovative financing options
-  Enabling energy transition through capex and opex based models
-  Energy manager for commercial and industrial processes
-  Round-the-clock renewable energy solutions
-  Facilitating transition from behind the meter to beyond the meter
-  Cost savings



Why choose Thermax solutions?

- ▶ Installation of 135+ solar PV plants on an EPC basis, cumulating to more than 65 MW of green power generation
- ▶ Industry leading performance ratio for solar power plants
- ▶ Expertise in hybridising solar with multiple energy sources optimally
- ▶ Global presence and capabilities

Case Study

Case:

A food processing multinational company required a sustainable power solution for plants across Maharashtra and Haryana.


Solution:

Thermax, with its proven expertise in solar EPC solutions, offered the customer a combination of 945 kWp rooftop and 1,350 kWp ground mounted solar PV installations to generate 33 lakh units per annum of green power, resulting in reliable and sustainable power of 2.3 MW. A special type of anti-skid walkway with handrails was provided on the roof for safe and easy cleaning of the solar panels.

Result:

Through the offered solution, the customer was able to reduce CO₂ emissions by 2,700 tonne per year and utilise renewable energy over the long-term.

 **72+** MW capacity

 **150+** delighted customers across geographies

 **200k+** tonne of reduction in CO₂ emissions

 **245+** million units of electricity generated

Air Pollution Control Solutions

Green technologies to control particulate and gaseous pollutants

Sustainable solutions to mitigate climate change

In order to realise the net zero goal undertaken by companies at the COP26 agreement, it is critical to curb emissions. Thermax, which has been offering solutions to control air pollution since 1980, has improvised, innovated and adapted its solutions to meet the evolving and new compliance standards. Technology is playing a crucial role in the endeavour. Our products offer unmatched services to our clients across the F&B value chain.

While Thermax APC helps our clientele to improve quality and comply with the prescribed norms, it also offers multi-fold benefits in the long run.



Benefits

-  Complying with statutory pollution control norms
-  Operates on a wide range of fuels, including coal, oil & gas, and biomass
-  On-site and remote services for all air pollution control equipment
-  Concept to commissioning solutions
-  High efficiency and longer product life
-  Product recovery can be achieved along with pollution control which is an added benefit to the customer
-  Spare parts for all air pollution control equipment irrespective of the make i.e. Thermax and non-Thermax make



Why choose Thermax solutions?

- ▶ Process knowledge acquired to handle a variety of dust, and expertise in handling various fuel firing conditions
- ▶ Retrofit/rehabilitation of existing air pollution control equipment
- ▶ Value-added services
- ▶ Experience in handling SO₂ abatement solutions for more than 20 years

Applications

- ▶ Removal of particulate emissions from the exhaust of captive and utility power plant boilers
- ▶ Material handling
- ▶ Product collection
- ▶ De-dusting

Thermax Offerings

Electrostatic Precipitator (Dry and Wet ESP)

- ▶ Capable of capturing 100+ types of particulate matters from 1 micron to 1,000 microns
- ▶ Opticor: fully automatic DSP based controller with power optimisation

Bag Filter

- ▶ Special fabrics for stringent emission norms, hood design and duct engineering for effective dust capture

Scrubber

- ▶ For particulate as well as gaseous pollution abatement, high collection efficiency for small and submicronic particles

Wet Type Flue Gas Desulphurisation (FGD) system

- ▶ Removal of SO₂, HCl, and HF with more than 97% capture efficiency
- ▶ Wet FGD system is equipped with ALRD[®] technology for achieving high SO₂ removal efficiency with less power consumption

Value-added Services

- ▶ Health check-up and troubleshooting of equipment
- ▶ Annual services and maintenance contracts
- ▶ Virtual technical support
- ▶ Optimisation studies and audits

Case Study

Case:

A renowned coffee producer was looking for air pollution control equipment to limit the emissions from its boiler as per regional statutory norms. The fuel used in the boiler was a combination of biomass such as rice husk, wood chips, briquette, and coal. The company needed to capture and remove fly ash coming out as residue from the boiler.

Solution:

After careful consideration of various fuels used in the boiler and the nature of dust particles from fly ash, we supplied a bag filter to handle the gas flow rate of 16,800 Am³/hr.

Result:

The bag filter effectively captured dust from the boiler and also limited the outlet emission in adherence to the regulatory norms.

 **25+**
industries served

 **40+**
years of expertise

 **88+**
countries

 **25k+**
successful installations





Water & Waste Solutions



Innovative solutions to reduce fresh water consumption, reuse and recycle wastewater

Achieving water sufficiency in the F&B industry

The food and beverages segment is a water-intensive industry that also faces dissension for higher wastage. Water recycling has emerged as the best solution that many industry stakeholders are tapping into. Recycled water helps the stakeholders in F&B to reduce dependency on freshwater, thus preventing the depletion of water levels.

Thermax as an industry solution provider in water and wastewater management, has a series of solutions that can be easily adapted by the F&B segment. These solutions also help industry players to strengthen their sustainability initiatives.



Benefits

- Recycled water for flushing, washing, and horticulture applications
- Compliance as per pollution control norms
- Recycling and sustainability
- Maximum uptime and increased lifecycle of the plant
- Integrated automation solutions
- Removal of fluoride, heavy metal, touch to degrade materials and solutions
- Reduced dependency on fresh water with better quality treated water parameters



Why choose Thermax solutions?

- ▶ High quality reference stations across industries and sectors
- ▶ Innovation-led play in niche applications
- ▶ End-to-end solutions in water management

Applications

- ▶ Water for boiler, cooling tower, chiller, and other utilities
- ▶ Water for solvent and dilution in processes
- ▶ Water for drinking, gardening, and cleaning application
- ▶ Sparkling line (bottled water) and carbonated beverages
- ▶ Fruit juice lines and breweries

Thermax Offerings

Effluent Treatment Plant (ETP)

- ▶ Up to 95% water utilisation from purified water

Effluent Recycle and Zero Liquid Discharge Solutions

- ▶ Tailor-made solution for specific constituents to meet discharge norms

Sewage Treatment Plants

- ▶ Up to 90% water recovery from recycling

Thermax differentiated services

- ▶ Plant improvements, automation and upgrades
- ▶ Plant audits and evaluation
- ▶ Spare parts management and support
- ▶ Characterisation and treatability test
- ▶ Membrane integrity autopsy

Case Study

Case:

A food and beverages conglomerate from Punjab, India, required a water recycling unit in order to reduce the intake of fresh water consumption.

Solution:

Thermax's expert team assessed the site and proposed three plants to treat the water and recycle it for their process needs. The initial fresh water requirement for the process was 17.5 m³/hr, out of which 13.5 m³/hr was treated and recycled back to the system. The ETP treated 210 m³/day of wastewater and RO reject, out of which 180 m³/day was recycled back for utilities like boilers and cooling towers, resulting in 85% of wastewater recycling.

Result:

Thermax helped the customer achieve water independence and sustainability goals.

5+ decades of knowledge expertise

600+ large and 25,000 standard plants installed

80k+ m³/hour wastewater recycled

180k+ m³/hour successful installations



Chemical Solutions

Customised solutions for a variety of applications

Boosting productivity while maintaining food quality

Catering to people's demand for high-quality processed food, an effective food-grade resin has a vital role to play. Tulsion® ion exchange resins meet the various process needs and are specially manufactured in a clean and hygienic environment to suit the requirement of the food and beverages industry. Feed water can be treated with a range of water treatment chemicals so that it can be used in the process cycle of the F&B industry, and further used water can be discharged as per regulatory norms using a customised water treatment programme.

Thermax's viable construction chemicals serve the industry with customised waterproofing and flooring solutions to maintain hygienic and sterile conditions.



Benefits

Tulsion® Ion Exchange Resins



Higher operating capacity and regeneration efficiency



Superior physical stability, low leachable and colour throw



NSF certified and food-grade products compliant with US FDA

Construction Chemicals



CFTRI approved food-grade coating for storage areas



Abrasion, chemical, thermal and impact resistant



Durable and long lasting waterproof structures

Water Treatment Chemicals



Control of corrosion, scaling and fouling of utilities



Increase in uptime and longer life of equipment



Reduced water footprint



Assured technical service at doorstep within 24 hours



Why choose Thermax solutions?

- ▶ Pioneer in manufacturing of Tulsion® brand of ion exchange resins
- ▶ Chemicals are manufactured from three world-class manufacturing units
- ▶ Customised solutions as per the customers' requirements for the food and beverages industry
- ▶ Well-maintained standardised R&D laboratories with experienced professionals and modern instruments
- ▶ Global presence backed by a strong dealer network

Applications

F&B Processes

- ▶ Liquid glucose de-ashing / inversion
- ▶ Sugar/juice de-colourisation / de-acidification
- ▶ Oligosaccharide separation
- ▶ Softening and demineralisation
- ▶ Maintaining hygienic and sterile conditions
- ▶ Durable industrial flooring and waterproofing solutions
- ▶ Joint-free, seamless flooring, protective coating solutions for walls, steel structures, water tanks and ETPs

Industrial Water and Wastewater Treatment

- ▶ Treatment of feedwater used in boilers, chillers and cooling towers
- ▶ Effluent treatment and water recycling using chlorine dioxide and efficient microbes

Thermax Offerings

Tulsion® Ion Exchange Resins

- ▶ Cation and anion resins
- ▶ Mixed bed / ultra-pure resins
- ▶ Adsorbent resins / chelating resins

Water Treatment Chemicals

- ▶ Boiler, cooling water chemicals and fuel additives
- ▶ Polyelectrolytes for raw water, wastewater treatment and recycling
- ▶ RO antiscalant and cleaning chemicals
- ▶ Efficient microbes for BOD/COD reduction in effluents
- ▶ Automated dosing and online monitoring system
- ▶ Green chemicals

Construction Chemicals

- ▶ Tecfloor range of industrial flooring
- ▶ T-Guard range of protective coatings
- ▶ Maxshield range of waterproofing solutions
- ▶ Maxgrout range of grouts and anchors
- ▶ Maxtite range of tile adhesives

Case Study

Case:

One of the largest sugar refineries in Thailand, using acrylic macroporous type strong base anion resin in the primary column and styrene type anion resin in the secondary column for decolourisation of 60° brix sugar melt, was operating in lead-lag operation. The columns had a colour level of 600 ICUMSA, but the customer required lesser colour levels.

Solution:

Thermax proposed to replace both streams with styrenic-styrenic macroporous strong base resin.

Result:

The solution led to substantial savings on resin cost and better-treated syrup volume of the desired colour level < 150 ICUMSA. Based on the pilot trial results, the customer replaced the entire quantity of the existing resin with Thermax Tulsion® A-722 MP.



40+

years of experience



40+

industries served



100+

projects commissioned globally



5,000+

customers across the globe

Utility delivery under the Build-Own-Operate model

Trusted partners enabling the F&B industry to focus on their core business

Thermax offers a variety of solutions in the BOO business model. In a bid to optimise costs, reduce carbon footprint and freshwater consumption, and focus on their core businesses, Thermax's subsidiary company, Thermax Onsite Energy Solutions Limited (TOESL), provides outsourced utilities to various industries, including the F&B industry.

The company's utility solutions include steam, heat, chilled water, treated water, power cogeneration and solar-based power on a Build-Own-Operate (BOO) business model. TOESL invests in and installs utility plants at the customer premises and provides comprehensive operation and maintenance, along with supply chain management to various stakeholders in the F&B segment.



Value proposition of Build-Own-Operate solution

- ▶ Green utilities supplied based on renewable, recycling and recovery solutions
- ▶ Capital investment by TOESL freeing up cash flow for core business
- ▶ Operational risk management
- ▶ Lifecycle maintenance and performance responsibility of the utility plant by TOESL

Thermax Offerings

- ▶ Biomass based steam supply
- ▶ Biomass based heat supply
- ▶ Biomass based cogeneration power supply
- ▶ Treated water supply
- ▶ Recycled water supply
- ▶ Multi-utility supply

Benefits

- End-to-end utility delivery on consumption based billing
- Free up cash flow for core business
- Avail expertise related to utility equipment
- Eliminate energy and operational inefficiencies
- Decarbonisation – reduces carbon footprint
- Uninterrupted biomass fuel supply chain management
- One-stop solution for all plant utilities
- Guaranteed performance and uptime of utility plant
- Achieve sustainability goals in partnership with utility OEM

Case Study

Case:

A multinational food major wanted to replace natural gas in its greenfield project in Gujarat, India, with agro-waste biomass fuels for its noodles production. It wanted to create a fuel supply chain from source to site with a guaranteed biomass quality and price.

Solution:

Thermax provided state-of-the-art, optimised multi-fuel combustion technology to generate the steam required for direct heating in noodles production. An appropriate air pollution control equipment was also incorporated.

Result:

Through the Build-Own-Operate model, the customer stands to achieve an estimated CO₂ reduction of over 16,000 tonne annually and also ensuring consistent quality at the right price.



Why choose Thermax solutions?

- ▶ Only OEM company to provide end-to-end utility services under a decarbonisation initiative
- ▶ Partnering with 20+ large corporates and MNC for utility supply under BOO globally
- ▶ Long-term contracts under the BOO model
- ▶ Single point responsibility of the entire utility spectrum
- ▶ Established supply chain of 1,000+ tonne of biomass fuel per day

0.58+ million tonne per annum of CO₂ equivalent reduction across all sites

35+ installations in India; first installation in Indonesia under execution

60+ assets under management across sites

0.22+ million kilo litre of total water treated



Thermax Helps Leading F&B Major to Adopt Sustainable Practices

Introduction

As the Food & Beverages industry involves multiple processes, it requires reliable heating, cooling, and power solutions to ensure process efficiency and reduce operational costs. Also, due to a large amount of waste generation in terms of solid waste and effluents, waste management and water treatment are equally important. The F&B Industry is therefore looking at areas such as waste-to-heat generation, process heat recovery, wastewater treatment, etc. in order to optimise resources.

About the Company

Godrej Agrovet Limited is a diversified, research and development based agri-business company with a leading market presence in oil palm plantations in India. The company has developed

more than 61,700 hectares of plantations across India and produces a range of products, including crude palm oil, crude palm kernel oil and palm kernel cake.



Challenge

Process waste like empty fruit bunch, palm kernel shells and palm fibres was a concern for Godrej Agrovet's Chintanapalli plant, a palm oil processing plant. The company wanted to adopt a waste-to-energy recovery plan to convert this biodegradable waste for process steam generation, thus supporting its sustainability drive.



Solution

Considering Thermax's expertise in biomass burning technology and EPC solutions, Godrej Agrovet awarded the contract for the power plant design, engineering, supply, erection and commissioning of the prestigious project of the Chintanapalli plant.

Thermax took turnkey responsibility for this project with the assurance of on-time project completion, safe execution and the least lifetime cost.

Thermax conducted a thorough study of plant conceptualisation, cogeneration cycle, fuel option analysis, environmental impact, process energy demand pattern analysis (daily, seasonal, annual), operating flexibility etc.

To utilise the high calorific value waste, the Thermax expert team proposed upgrading the existing boiler to high pressure and passing the steam through a turbine to

generate power and using the backpressure steam for process requirements.

The project configuration comprised a 4 MW cogeneration plant with Thermax's 50 TPH pusher grate boiler, steam turbine, TDPS alternator, and balance of plant (fuel handling system, cooling tower, ash handling system, electrical and instrumentation system). We also supplied a water treatment plant of 50 m³/hr, an air cooled condenser and an electrostatic precipitator.



Scan for more details

Result

Thermax's expertise yielded excellent results. Thermax's ESP helped the customer meet stringent environmental regulation norms of less than 50 mg/Nm³. By installing ACC, the customer was able to conserve water used during the cooling process. The pusher grate boiler helped in the complete combustion of the fuel to achieve high efficiency, while the robust construction led to high operational reliability. The technology being unaffected by fuel and load conditions allowed the customer to adjust to varying load requirements.

The project was executed in 14.5 months despite 2,000 tonne of erection and commissioning of electromechanical works. The hydro test of the boiler was conducted in a record time of 3.5 months. Also, the entire commissioning activities - boiler light up to STG synchronisation were completed in just 27 days.

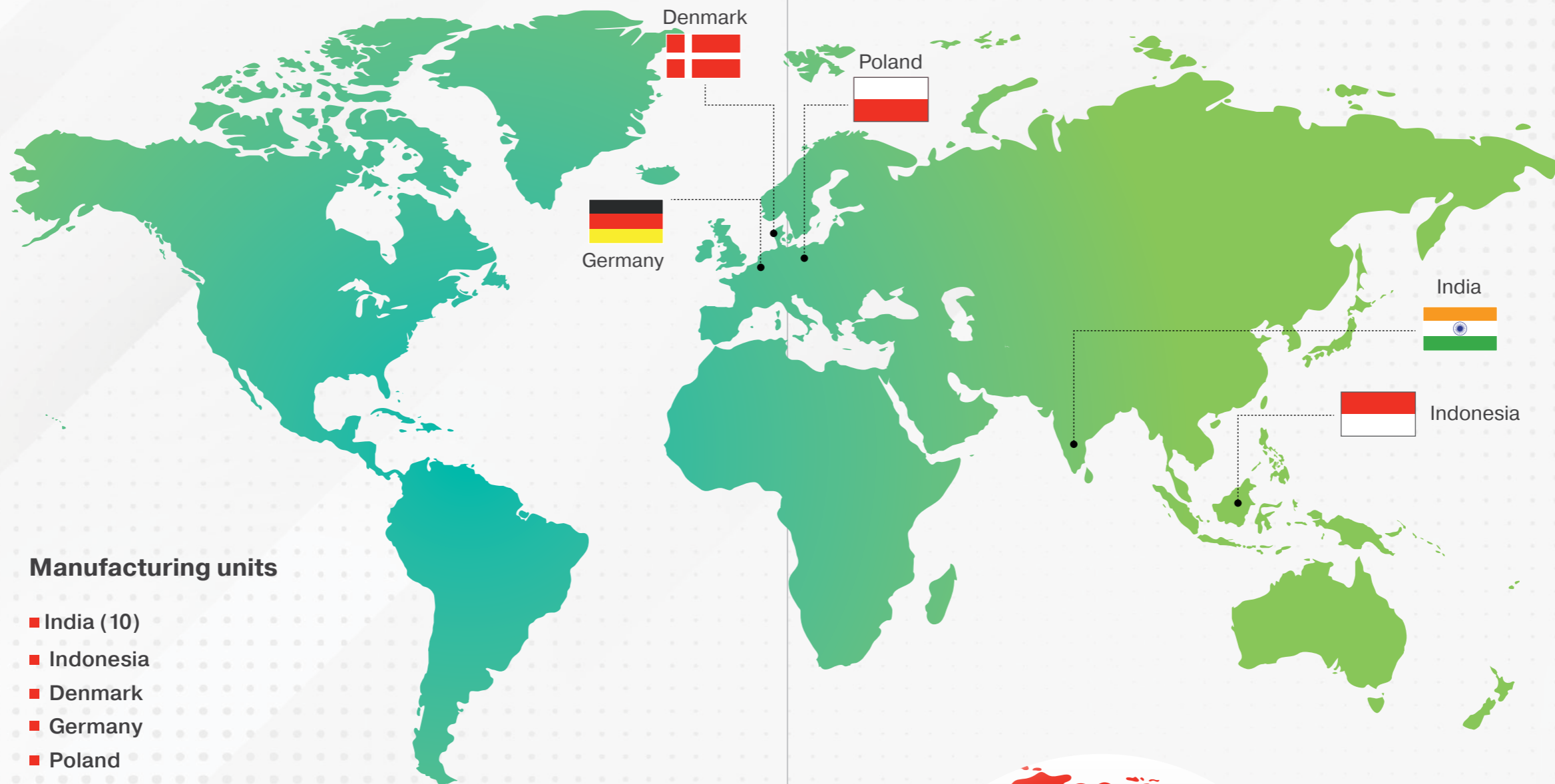
The project was executed in

14.5 months

despite 2,000 tonne of erection

Customer Appreciation

The successful execution of the project and consistent performance since commissioning were highly appreciated by the customer. The customer is considering repeat orders for any such projects in the future.



Manufacturing units

- India (10)
- Indonesia
- Denmark
- Germany
- Poland

Head Office
India

International Subsidiaries, Sales & Service

- | | | | |
|--------------|---------------|----------------|-----------|
| ■ Bangladesh | ■ Kenya | ■ Russia | ■ U.K. |
| ■ Brazil | ■ Malaysia | ■ Saudi Arabia | ■ U.S.A. |
| ■ Canada | ■ Mauritius | ■ Senegal | ■ UAE |
| ■ Denmark | ■ Myanmar | ■ Singapore | ■ Vietnam |
| ■ Egypt | ■ Netherlands | ■ Sri Lanka | ■ Zambia |
| ■ Germany | ■ Nigeria | ■ Tanzania | |
| ■ Indonesia | ■ Philippines | ■ Thailand | |
| ■ Italy | ■ Poland | ■ Turkey | |



90+
Countries

14
Facilities

Industries Served



Agriculture & Allied Industries



Automobiles & Auto Components



Aviation



Cement



Chemical



Commercial & Construction



Engineering & Capital Goods



Food & Beverages



FMCG



Healthcare



Hospitality



Infrastructure



IT & Data Centre



Medical Devices



Metals



Oil & Gas



Paper & Pulp



Pharmaceutical



Power



Renewable Energy



Rubber



Telecommunication



Textiles



Wood

Registered Office

D-13, MIDC Industrial Area, R D Aga Road,
Chinchwad, Pune 411019, India

Email: enquiry@thermaxglobal.com

Customer Care: 1800-209-0115

Corporate Office

Thermax House,
14 Mumbai Pune Road,
Wakdevadi, Pune 411003, India

www.thermaxglobal.com



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