

Integrated Cleanroom Technologies Pvt. Ltd.



TURNKEY CLEANROOM SOLUTIONS

Turnkey Solutions

- Civil
- Cleanroom
- HVAC
- Electrical
- BMS
- LSS
- Utilities



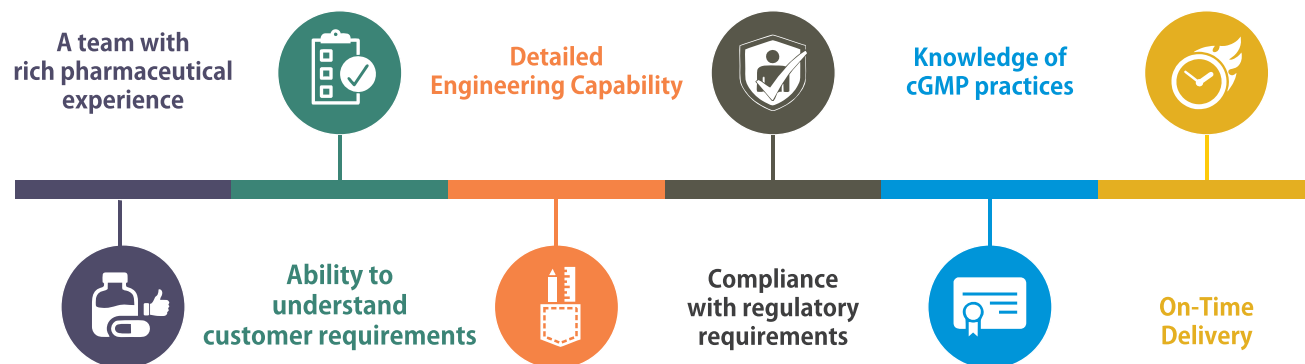
About **iCLEAN**

Integrated Cleanroom Technologies Private Limited (iCLEAN) was established in 2003 primarily to serve the cleanroom requirements of customers, which were until then serviced through imports. As pioneers in this field, the solutions from iCLEAN were readily accepted by the customers. Since then iCLEAN with its unflinching focus on customer requirements evolved into the largest cleanroom partition manufacturers in India.

The state-of-the-art manufacturing facilities equipped with CNC machinery, top class powder coating line and in-situ high pressure foaming with a manufacturing capacities of Partitions 600,000 Sqm/Annum, AHUs 1000 Units/Annum Equipments-1200 Units/Annum and Lab Furniture-1000 Units/Annum enable iCLEAN to meet the divergent requirements and specifications of the customers. Branch offices operating from Mumbai, Delhi, Chennai, Ahmedabad and Bangalore ensure faster reach to our customers.

iCLEAN's committed and motivated team of experts with vast experience in the Pharmaceutical and Electronics industry keeps itself updated with the ever changing needs of the industries being served by us. iCLEAN products are designed to meet operational flexibility and confirm to stringent quality norms as per cGMP standards.

Our **CORE STRENGTHS**



Turnkey Solutions



iCLEAN is a leading global player in providing Integrated Turnkey Solutions for the



Pharmaceuticals



Biotechnology



Healthcare



Micro electronics



Food & Beverages

iCLEAN meets all its client needs by offering customized leading edge solutions.

Our in-house state-of-art facility ensure faster turnover of components and equipment thereby saving time and cost providing freedom from multiple vendor co-ordinations.

We offer complete concept to commissioning services and undertake Turnkey Project Management and delivery.

With years of experience behind us and with many a challenging projects executed successfully, iCLEAN possess the knowledge, resources and manpower required to undertake turnkey installation of your projects. iCLEAN take over right from the concept stage and partner with you till the project is commissioned. iCLEAN experienced validation team ensures you are well supported in terms of the validation process and documentation. iCLEAN integrate all the key process and functional equipments to ensure your project is completed as per the concept agreed upon and undertake installation, commissioning and validation of key equipment / components like

► **Civil**

► **Cleanroom**

► **HVAC**

► **Electrical**

► **BMS**

► **LSS**

► **Utilities**

iCLEAN in-house state of the art manufacturing setup enables us to offer modular Cleanroom Partitions, Cleanroom equipments and AHUs that are of world class standards and we install, commission and support validate them in the committed timelines.

Civil



In line with its objective of providing Turnkey Project solutions to customer, iCLEAN has empowered its core strength in the industry by including the Civil, Structural and Architectural (CSA) works in their scope of works. By including the team having specialized expertise in CSA right from the senior management level till the site supervision staff including the design strength, iCLEAN can be trusted by customers as one-stop solution for all their turnkey project requirements. Some of the main work packages in this vertical, but not limited to, are:

- ▶ **Architectural design**
- ▶ **Internal Roads**
- ▶ **Structural calculations and simulations**
- ▶ **Parking area**
- ▶ **Building construction**
- ▶ **Rain Water Harvesting**
- ▶ **Structural Steel works**
- ▶ **Landscaping**
- ▶ **Underground tanks construction**
- ▶ **Statutory Compliance Support**



Modular Cleanroom

Cleanrooms are unique in their construction, having virtually every component built in during production to suit all applications and to meet industrial requirements.

iCLEAN offers a complete range of cleanroom partition and ceiling systems. These systems meet the technical requirements of high specification controlled environments such as Pharmaceutical, Biotech and Microelectronics & Semiconductor, as well as Food-processing plants. The ceiling panels are non-particle shedding, load bearing, walkable panels and feature pre-formed cut outs for the housing of HEPA filters & Light fixtures and other dedicated services.

WALL

A vital ingredient in the creation of Cleanrooms, Wall panels form a substantial part of our product offerings. iCLEAN wall panels are manufactured in standard sizes and can also be customized depending on the requirement.

CEILING

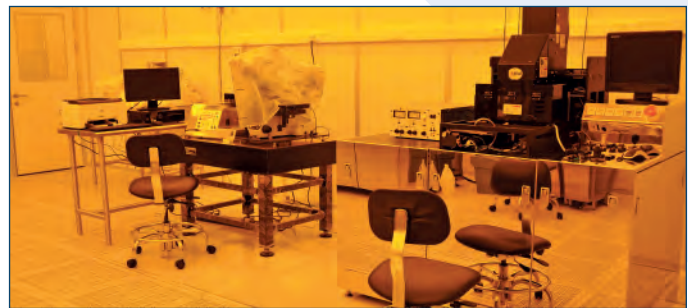
A perfect ceiling makes a perfect Cleanroom, iCLEAN Ceiling Systems are designed to fit every requirement and adhere to stringent Quality Standards that fit in seamlessly with the rest of the room paneling. The Ceiling Panels are fastened to profile that are placed on a particle-tight extruded aluminium grid matrix with suitable measure to Air-tightness such as silicon sealant.

DOOR

iCLEAN provide wide range of Cleanroom compatible Doors. These are basically meant for air ingress in the room. The door has mechanically interlocked vertical edges that add strength and rigidity, which makes them appropriate for light and heavy use. Thick flush doors made of PU based powder coated GPSP sheet with honeycomb kraft paper / PUF / Rockwool as infill, GPSP powder coated door frames, with provisions for double glazing glass and hardware like push plate, door closure, SS D handle, SS ball bearing butt hinges, concealed tower bolt for the double door etc.

EQUIPMENT

iCLEAN also manufacture cleanroom equipment such as Pass Boxes, LAFUs, Sampling & Dispensing Units, Air Showers, Mist Showers, Fume Hoods, Lab Furniture and Island Benches.

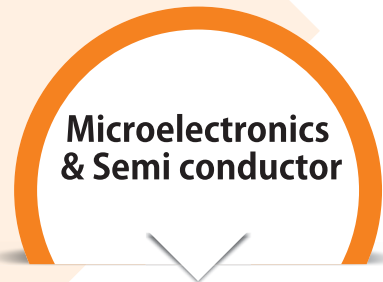




HVAC refers to the mechanical system of the building that provides Heating, Ventilation and Air Conditioning (HVAC) within the building. This includes HVAC high side equipments such as Chillers / Air-Conditioners, pumps and piping network and low side equipments such as Air Handling Units (AHUs), Ducting, Duct Insulation, Filter Modules, Filters, Grills, Diffusers, Dampers and AHU manifolds.

iCLEAN manufactures AHUs, Ducting and Air distribution products and follow a very Stringent quality control systems and up-to-date guidelines, where we ensure every raw material and every manufactured items is tested and approved as per the set quality norms. This ensures optimum performance of the equipments.

We develop DQ, IQ, OQ documents and validate the facility as per cGMP protocols.



Electrical

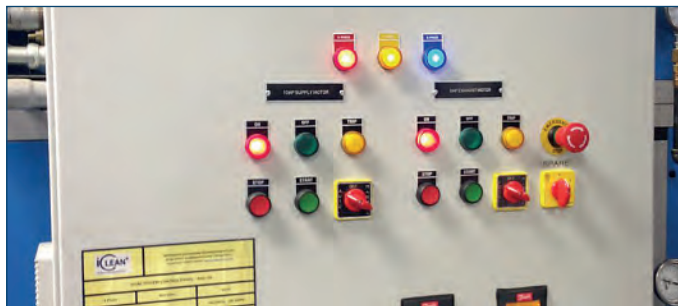


Electrical system has been one of the core competences of iCLEAN in their turnkey solutions journey as it becomes essential part of the scope of works due to its inter-dependency. Electrical system shall be designed in such a way that the Cleanroom systems can be run uninterruptedly for round-the-clock operations of facilities and also to provide required power for the Process Equipments. The design process starts from identifying the power distribution requirements of the customer and charting a final power distribution schematic which once upon approval will be taken for detailed engineering to provide the desired turnkey solutions. Major works packages in electrical systems, but not limited to, can be:

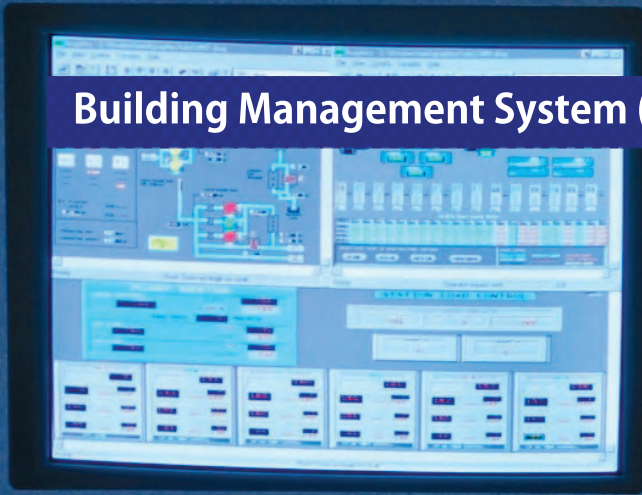
- ▶ Load requirement analysis and calculations.
- ▶ Basic and Detailed Engineering
- ▶ Incoming power Substation works
- ▶ Transformers
- ▶ Bus Ducts

- ▶ HV, MV and LV distribution Panels
- ▶ Automatic Power Factor Correction Panels.
- ▶ Diesel Generator (DGs)
- ▶ Uninterrupted power supply (UPS)
- ▶ Earthing Works

- ▶ Power distribution up to the socket level
- ▶ Complete cabling works
- ▶ Complete Cleanroom Lighting
- ▶ Internal and external lighting works
- ▶ Lightning Arrestors



Building Management System (BMS)



Building Management System (BMS) is the program required to achieve required level of monitoring and control of all the connected systems of the cleanroom facility. The level of automation required can be customized to the client requirements to any level. It can be achieved by using suitable sensors at different locations where we need to measure the value and have a controller which can interpret the input, process it and display the values and also set the values for any applicable alarms, controls, modulations.

The major advantage of having the BMS is that all these monitoring and controlling parameters can be finally displayed and recorded automatically in a computer screen at control room which can have one user who can monitor all the facility health status centrally. Some of the salient features of BMS are:

- 1 Monitoring of all required parameters of the facility to ascertain the health of the running plant.
- 2 Automatic controls for critical parameters can be set so that the system can control those parameters in the specified range only.
- 3 For parameters which are safety-critical, Suitable Alarms, Interlocks, and System shutdowns can be programmed to avoid untoward incidents.
- 4 Completely flexible to be adopted to the process and user requirements.
- 5 Automatic data recording at regular intervals so that history can be analyzed.
- 6 Intelligent graphs generation.
- 7 Integration with other third party services such as Compressors, Chillers, Vacuum pumps, Fire Alarm System, CCTV Systems, Cleanroom particle counter etc.,

Other systems integrated with BMS

CCTV & Surveillance

Access Control

Door Interlocks

Voice & Networking

Life Saving System (LSS)



Life Saving System (LSS) is the most critical part of cleanroom facility with safety concerns of any kind. Process safety plays most vital role in any plant as in addition to the administrative safety policies, Safety of the process equipments and facilities also contributes significantly in the operations. Some of major LSS Packages catered are:

Fire/Smoke Detection System

- ▶ Heat & Smoke Sensors
- ▶ Fire Control panel
- ▶ Multi-sensing detectors
- ▶ Laser Detectors
- ▶ UV/IR Detectors for high hazard areas such as flammable gas storage.
- ▶ In high precision cleanrooms, Aspirating type smoke detection can also be used.

Fire Suppression System

- ▶ Fire Sprinkler System
- ▶ Wet Sprinkler Systems
- ▶ Dry Sprinkler Systems
- ▶ Deluge systems (For high hazard areas)

Fire Hydrant System

- ▶ Electrical Fire Pumps
- ▶ Diesel engine driven Fire Pumps
- ▶ Jockey pumps (For pressurization)
- ▶ Complete Underground / over ground piping
- ▶ Fire Cabinets with Hose reel and Nozzles
- ▶ Fire Hydrant Posts



Gas based Fire suppression System

Critical cleanroom facilities such as semiconductor industries need fire suppression system other than water based as the process equipments and products used in cleanroom are electronic and prone to short circuit issues. Hence specialized gas suppression system will be used in such cases where upon fire detection (either automatic or manual); Fire suppression system releases an inert gas into the cleanrooms after set interval of time enabling personal evacuation & extinguishing of fire

Gas Detection System

Bulk and specialty gases are used in significant amount in some of the cleanroom plants such as semiconductor facilities. In such plants, there will be an extensive amount of piping distribution system with high quality orbital welding with Gas Cabinets, Gas Panels, Regulators, etc., right from the source till the multiple points of use. To ensure process and personnel safety from any accidental leakage of these gases, a high precision Gas detection system will be implemented based on the gases being used. These detectors are programmed in turn with a controller so that in case of any gas leak detection, Alarm will be initiated and also the source of the gas will be cut-off.

Safety Interlocks

Various interlocks will be deployed to ensure process & personnel safety in case of emergency arising in the cleanroom facility such as:

- ▶ **In case of Fire detection, All Access controlled doors are automatically opened to enable speedy evacuation.**
- ▶ **Upon fire detection, AHUs can be tripped off so as to avoid smoke getting recirculated to connected rooms.**
- ▶ **Strobe lamps can be used to identify the area of fire detection for speedy action.**
- ▶ **Fire detection can trigger close off of Fire dampers in the HVAC System**
- ▶ **Fire detection system can automatically trigger suppression system.**
- ▶ **UV/IR Detectors at bulk gas storage yards to detect flame and initiate fire evacuation plan and activate any suppression system.**



Various utilities are required for the intended process inside the cleanroom as per the customer operations. Following is the partial list of such utilities in which Iclean has got substantial experience in coordination and integration with Cleanroom to provide Turnkey Solutions.

- ▶ **Compressed Dry Air (CDA)**
- ▶ **Process Vacuum**
- ▶ **House Vacuum (High tech cleaning of cleanrooms)**
- ▶ **Gas Abatement Systems**
- ▶ **Exhaust Scrubbers**
- ▶ **Dry Scrubbers for Gas Systems**
- ▶ **General Heat exhaust Systems**
- ▶ **Bulk Gas system**
- ▶ **Process Cooling Water Systems including heat exchangers**
- ▶ **Specialty Gas Systems**
- ▶ **Ultra Pure water Plants (RO , DI , DM etc.,)**
- ▶ **Complete Piping / Duct Network**
- ▶ **Complete Effluent drain collection and treatment facilities**

All kinds of piping and distribution Systems

- ▶ **MS / GI Piping**
- ▶ **Complete SS-316L EP tubing including orbital welding**
- ▶ **Complete SS-304 piping**
- ▶ **Gas Piping testing and validation**

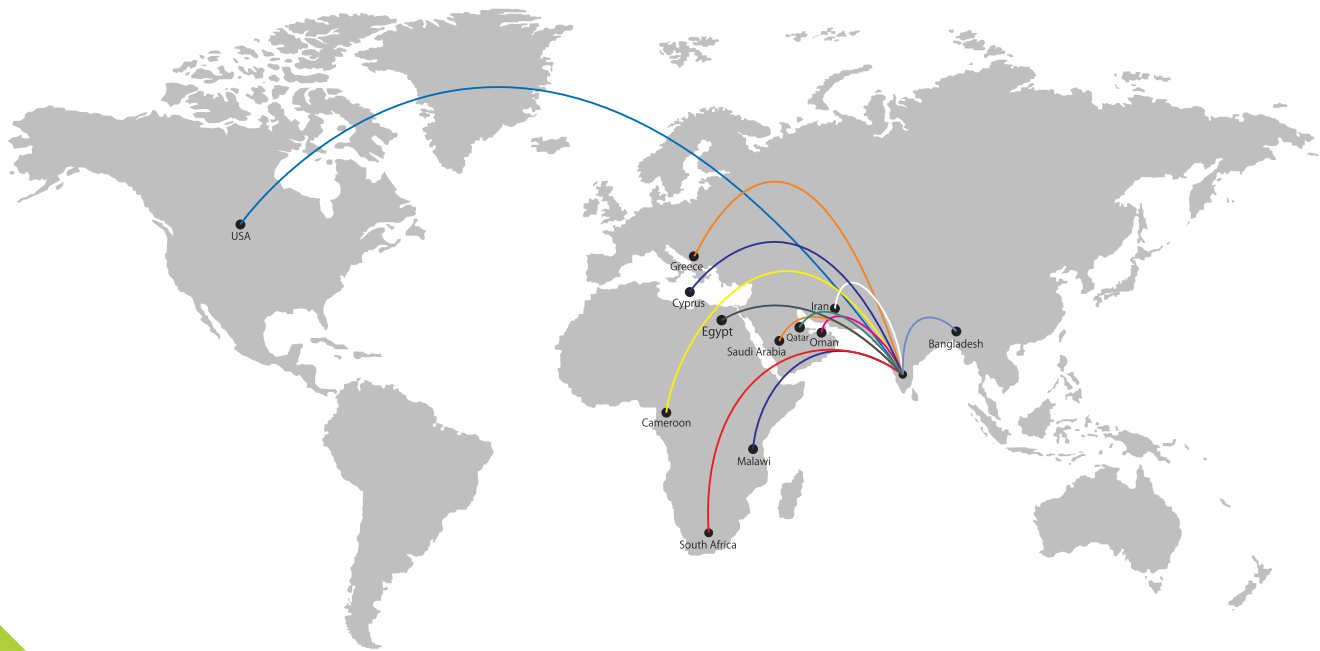
Complete Plastic Piping Systems ▶ uPVC ▶ cPVC ▶ ABS ▶ PP ▶ PVDF

Clients



and many more...

Global Presence



WORLDWIDE EXPORTS
to 17 Countries in
5 Continents

1250+ INSTALLATIONS
across the globe

EXPERIENCE
of over 16 Years in
Mfg. & Management

1200+ TEAM MEMBERS
Skilled & Committed

iCLEAN[®]


(TTE GROUP COMPANY)



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