

# Xtending Engineering Possibilities<sup>TM</sup>

*Empowering industry through innovation, intelligence and impact*



ISO 9001:2015  
Certified



Digital Smart  
Engineering



Sustainable  
Automation

**Specx Technologies Pvt. Ltd.**





## About us

Specx Technologies Pvt Ltd is an ISO 9001:2015 certified engineering and technology company committed to delivering intelligent, efficient, and sustainable solutions for the process industries. We offer end-to-end engineering services—from conceptual design to commissioning—by seamlessly integrating traditional engineering expertise with modern digital technologies.

Our multidisciplinary team works alongside clients to deliver tailored engineering solutions that improve performance, ensure regulatory compliance, and foster innovation. Operating across major industrial regions, we serve diverse sectors including chemicals, petrochemicals, water treatment, pharmaceuticals, and energy.

At Specx, we believe in pushing the boundaries of what's possible. Our approach combines engineering excellence with digital innovation, enabling us to tackle complex challenges and deliver projects that exceed expectations.



### VISION STATEMENT

To become a globally trusted engineering company delivering high-performance, smart, and sustainable industrial solutions through innovation and integrity



### MISSION STATEMENT

To empower industries through engineering excellence, digital intelligence, and sustainable innovation—offering customized, cost-effective, and technology-driven services that exceed client expectations.



### OUR APPROACH

We believe every project is unique, and our approach reflects that. At Specx, we combine technical expertise, domain insight, and a collaborative mindset to deliver intelligent, tailored solutions.



- ▶ **Client-Centric** : We listen, understand, and align with your project goals
- ▶ **Integrated Delivery** : Multidisciplinary coordination from design to delivery
- ▶ **Innovation-Driven** : IoT, AI, and digital tools embedded into core workflows
- ▶ **Sustainability-Focused** : Solutions that reduce waste, emissions, and costs
- ▶ **Agile & Scalable** : Adaptable delivery models for startups to large-scale industries
- ▶ **Standards-Compliant** : Adherence to global standards & codes

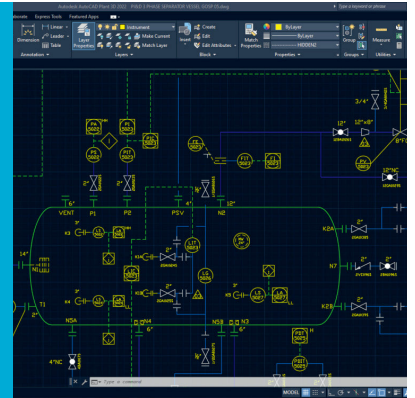
# 1. Basic & Detailed Engineering Services

We deliver multidisciplinary engineering services customized for diverse process industries. Our Basic & Detailed Engineering offerings are structured across five specialized domains:

## 1.1 Process Engineering

Complete process design, simulation, and safety services for efficient plant operations:

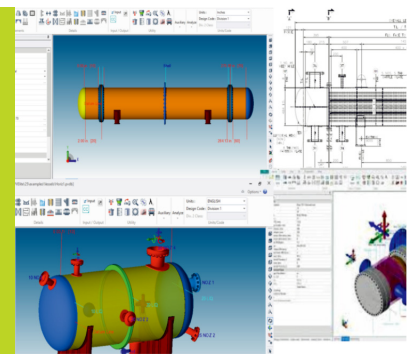
- ▶ PFD & P&ID preparation, simulation (Aspen HYSYS, CHEMCAD, Aspen Plus, HTRI)
- ▶ Equipment sizing, utility integration, process safety (HAZOP, SIL, LOPA)
- ▶ Flare system, PSV sizing, line pressure drop analysis
- ▶ Yield improvement, debottlenecking, and optimization
- ▶ Specialized systems: Pig launchers, separators, FWKO, heaters, SRUs, biogas, flare gas recovery, LNG skids, vapor recovery



## 1.2 Mechanical Engineering

Design and validation of static & rotating equipment:

- ▶ Pressure vessels, storage tanks (API 650), heat exchangers, etc.
- ▶ Pumps, blowers, compressors, VFD systems
- ▶ Skid packages: PRDS, desalters, amine, TEG, mini-LNG
- ▶ Softwares: PV Elite, EDR, SolidWorks, ANSYS



## 1.3 Piping Engineering

End-to-end piping layouts, stress analysis, 3D modeling:

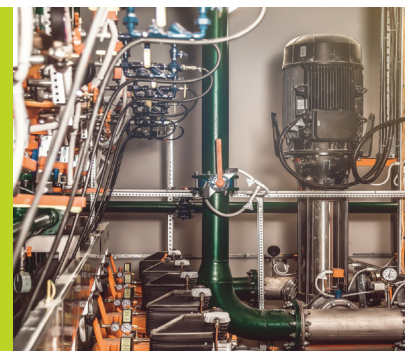
- ▶ GA drawings, isometrics, nozzle orientation
- ▶ Flexibility & stress analysis (CAESAR II), underground piping, routing
- ▶ 3D modeling with PDMS, CADWorx, SP3D, Plant 3D,



## 1.4 Electrical & Instrumentation Engineering

Safe and intelligent plant power & control systems:

- ▶ SLDs, load lists, cable trays, UPS, DGs
- ▶ PLC, DCS, SCADA integration, loop drawings, I/O lists
- ▶ SIL, ESD, SIS logic design and safety narratives



## 1.5 Civil & Structural Engineering

Foundation and structural design:

- ▶ Equipment & machine foundations (pumps, vessels, racks)
- ▶ PEBs, RCC buildings, drainage, access structures
- ▶ Structural analysis: STAAD Pro, Tekla, ETABS





## 2. IoT & AI-Based Automation and Digital Solutions

We enable smart, connected, and future-ready operations by integrating digital intelligence with engineering systems. Our IoT and AI-driven automation services enhance plant efficiency, safety, and decision-making capabilities



### 2.1 IoT-Enabled Automation

- ▶ Real-time monitoring of plant operations through smart sensors
- ▶ Edge computing, gateway systems, and PLC/DCS/SCADA connectivity
- ▶ Secure industrial communication protocols (MQTT, Modbus, OPC-UA)
- ▶ IoT dashboards with cloud or on-premise deployment



### 2.2 AI & Data-Driven Optimization

- ▶ Predictive maintenance using machine learning and pattern recognition
- ▶ Process performance analytics and anomaly detection
- ▶ Energy optimization, equipment efficiency prediction, downtime forecasting
- ▶ Digital twins for real-time simulation, decision support, and remote diagnostics



### 2.3 Custom HMI/SCADA Development

- ▶ Intuitive HMI and SCADA architecture for real-time plant visualization
- ▶ Alarm management, historical data trending and event logging
- ▶ Control logic implementation, system testing and FAT support



### 2.4 Remote Monitoring and Reporting

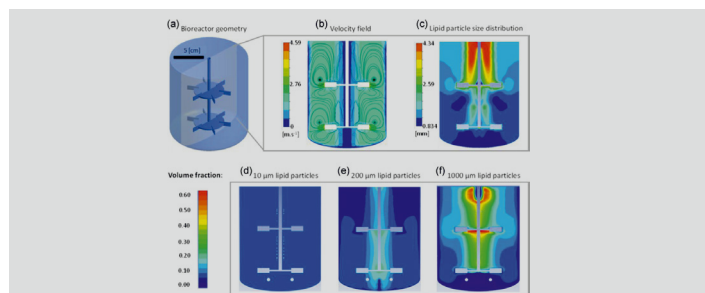
- ▶ Cloud-enabled dashboards for 24/7 remote access
- ▶ KPI visualization, performance tracking, and report automation
- ▶ Integration with mobile platforms and smart alerts for proactive response

With Specx, clients unlock the power of industrial intelligence—turning data into actionable insights and creating connected environments that boost efficiency, safety, and ROI.



### 3. CFD & FEA Simulation Services

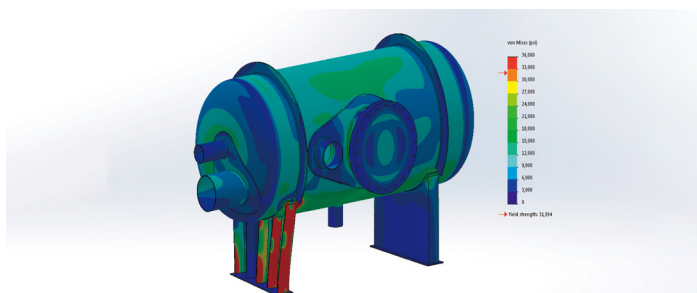
We offer high-fidelity engineering simulations to validate and optimize the performance of critical systems. Our CFD (Computational Fluid Dynamics) and FEA (Finite Element Analysis) capabilities ensure designs are structurally reliable, thermally efficient, and compliant with operational goals.



#### 3.1 Computational Fluid Dynamics (CFD)

Accurate flow and thermal modeling for optimization

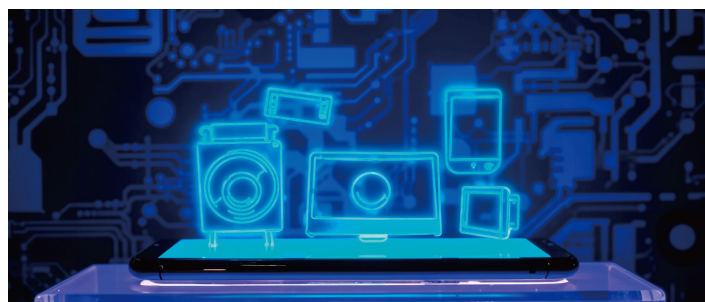
- ▶ Fluid dynamics, heat transfer, pressure drop & flow distribution
- ▶ Multi-phase, mixing, and chemical reaction modeling
- ▶ Process validation for scrubbers, heat exchangers, chimneys, ducting systems
- ▶ Performance analysis of ETP/STP aeration, flare stack dispersion, and vapor recovery



#### 3.2 Finite Element Analysis (FEA)

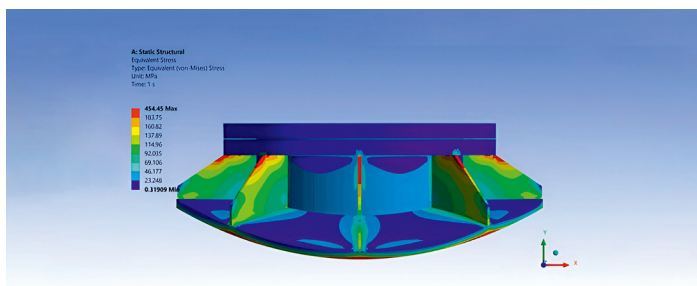
Structural reliability under thermal and mechanical loading:

- ▶ Static and dynamic stress analysis
- ▶ Thermal stress, fatigue life, creep & buckling
- ▶ Seismic and wind loading evaluations
- ▶ Flange/nozzle stress checks and local load analysis
- ▶ Mechanical integrity for vessels, jackets, skids, platforms



#### 3.3 Tools and Platforms

- ▶ CFD: ANSYS Fluent, OpenFOAM, COMSOL, SimScale
- ▶ FEA: ANSYS Mechanical, SolidWorks Simulation, ABAQUS
- ▶ Post-processing: Streamline flow visuals, vector plots, temperature contours



#### 3.4 Applications

- ▶ Heat exchangers, tanks, chimneys, scrubbers, filters
- ▶ Batch & continuous reactors
- ▶ Structural supports and vibrating systems
- ▶ Flow maldistribution analysis in multi-tube equipment
- ▶ Erosion, cavitation & wear prediction in rotating machinery

Through simulation-led design, we help reduce prototyping costs, improve safety margins, and accelerate time-to-market. Our digital validation tools ensure every engineering decision is backed by physics-based accuracy.

## 4. Engineering Consulting & System Integration

Specx offers strategic engineering consulting and multidisciplinary system integration services to deliver technically sound, cost-effective, and scalable industrial solutions across sectors.

### 4.1 Conceptual & Feasibility Studies

- ▶ Plant layout and space optimization
- ▶ Route planning, capacity studies, capex/opex estimation
- ▶ Technology evaluation and process feasibility assessment



### 4.2 Engineering Review & Technical Audit

- ▶ Design verification and peer review for third-party engineering
- ▶ Optimization and value engineering recommendations
- ▶ Vendor document review and TBE preparation



### 4.3 System Integration & Interdisciplinary Coordination

- ▶ Mechanical, electrical, civil, instrumentation interfacing
- ▶ 3D coordination, clash detection, layout optimization
- ▶ Modularization & skid-based execution strategies



### 4.4 Procurement & Vendor Support

- ▶ Specification preparation, vendor identification, bid evaluation
- ▶ Purchase support, FAT coordination, and inspection
- ▶ Cost tracking and milestone verification support



### 4.5 Commissioning & Site Support

- ▶ P&ID walkdowns, loop testing, pre-commissioning documentation
- ▶ Startup assistance, operator training, troubleshooting
- ▶ Final documentation and as-built engineering



Our consulting team ensures your engineering deliverables are future-ready, cost-aligned, and seamlessly integrated across disciplines—ensuring reliable execution, regulatory compliance, and lifecycle efficiency.



## 5. Environmental & Pollution Control Systems

Specx offers complete design and integration of air, water, and emission control systems to meet stringent environmental regulations and support sustainable industrial practices.

### 5.1 Effluent & Sewage Treatment Plants (ETP/STP)

- ▶ Primary, secondary & tertiary treatment systems
- ▶ Technologies: MBBR, MBR, SBR, RO, UF, AOP
- ▶ Modular, containerized or RCC-based solutions
- ▶ Sludge handling, dewatering, and water reuse systems



### 5.2 Air Pollution Control Systems (APC)

- ▶ Wet scrubbers (packed bed, venturi), dry scrubbers, bag filters
- ▶ Dust extraction & fume collection systems
- ▶ Stack design, chimney dispersion & air modeling studies
- ▶ VOC & odor control using activated carbon, bio-filters



### 5.3 Flue Gas & Gas Stream Treatment

- ▶ FGD units for SO<sub>x</sub> removal (wet & dry)
- ▶ Amine-based gas sweetening (MDEA)
- ▶ TEG/Molecular sieve-based gas dehydration units
- ▶ Flare systems: Knockout drums, seal drums, flare stacks



### 5.4 Biogas & VOC Recovery Systems

- ▶ Biogas purification, compression, and utilization systems
- ▶ Flare gas recovery & conversion to methanol/DME
- ▶ Vapor recovery units for minimizing VOC emissions
- ▶ Integration with cold storage for LNG and energy capture



Our environmental systems ensure industrial sustainability while maintaining cost-efficiency and regulatory compliance—delivering clean, smart, and modular pollution control solutions tailored to your plant.



## Why Choose Specx Technologies?

At Specx Technologies, we go beyond conventional engineering. We combine deep technical expertise with smart digital innovation to deliver results that matter—technically, economically, and environmentally.

- ✓ ISO 9001:2015 Certified & Quality Committed
- ✓ Integrated Engineering + Digital + Environmental Capabilities
- ✓ Multi-disciplinary Team with Industry-wide Experience
- ✓ Advanced Tools: IoT, AI, CFD, FEA, SCADA, Digital Twins
- ✓ End-to-End Execution: From Design to Commissioning
- ✓ Focused on Safety, Sustainability, and Operational Excellence

Whether it's a Greenfield plant, Brownfield upgrade, or digital transformation initiative—we help our clients engineer the future.



## Our Presence (Offices + Representatives)

**India:** Vadodara (HO) | Bharuch (RO) | Mumbai | Delhi | Pune | Noida

**USA:** Texas

**UAE:** Dubai (Incorporation in Progress)

**Corporate Office:** A-245, Atlantis K-10, Sarabhai Compound, Nr. Genda Circle, Vadodara – 390 023, Gujarat, India

**Registered Office:** 709, Golden Square, B/s. D-Mart, College Road, ABC Circle, Bholav, Bharuch – 392 001, Gujarat, India

**Branch Office (Upcoming):** B-103, Ascend Tower, Link Road, Near Malad (W) Metro Station, Mumbai – 400 064, Maharashtra, India

## Contact:

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**Xtending Engineering Possibilities™**