ADYA ENTERPRISE

SHINE A LIGHT ON YOUR TECHNOLOGY

Technologies for sustainable and effective combination.

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Be a global leader as one point chemical engineering system integrator and process solution provider and deliver quality process integrated system with higher efficacy through state of the art know-how and innovative process technology with dedicated customer care.
Process Development

Process Technology Transfer

Basic Engineering of Process Technology

Detail Engineering of Process Technology

Fabrication of CRITICAL Equipment with Performance Guarantee

Automation of Process

Advanced Process Control Solution with Performance Guarantee

Cold Commissioning and Hot Commissioning Support for Process Technology Transferred

Process Intensification, Debottlenecking, Capacity Enhancement
Turnkey Projects
BEP / DEP / CR. FABRICATION / SUPERVISION / COMMISIONING

Soft Solutions
MODELING / SIMULATION / OPTIMIZATION / DATA ANALYTICS

Automation
PROCESS INST. DIA. / PROGRAMMING (PLC / DCS / SCADA)

Advance Process Control
ARC / MPC / INFERENTIAL CTRL. / SEQUENTIAL CTRL. / SPC / MPO
**LICENSED SOFTWARES:**

**SOLIDWORKS 3D - PREMIUM**

- Part and Assembly Modeling
- 2D Drawings
- Design Reuse and Validation
- Animations and Renderings
- Advanced Design for Manufacturing
- Tolerance Stack-up Analysis
- Motion Analysis
- Structural Part and Assembly Analysis
- Routing of Pipes and Tubes
- Routing of Electrical Cabling and Wiring Harness

**SOLIDWORKS 3D - SIMULATION PROFESSIONAL**

- Cocurrent Engineering
- Finite Element Analysis
- Advanced Contacts and Connectors
- Post Processing
- Linear Static Simulation for Assembly
- What-if Scenario based on defined variables
- Trend Tracker
- Fatigue Simulation
- Design Optimization
- Event-Based Motion Simulation
- Buckling or Collapse Simulation
- Structural Thermal Simulation
- Drop Test Simulation
- Pressure Vessel Design Simulation
LICENSED SOFTWARES:

**SIEMENS DCS - PCS7 SMART**
- Process Historian and Information Server
- SIMATIC BATCH
- Maintenance Station / SIMATIC PDM
- Integrated telecontrol
- Energy Management
- APC Optimization
- Plant Asset Management
- Integration of switchgear
- Integration of package units
- Integrated field Devices
- Safety Integrated
- Information Management
- Integrated Engineering
- Life Cycle and Remote services
- Simulation FAT/OTS
- Interfacing IT system

**SIEMENS SCADA - WINCC RC 2048**
- Multiuser System
- Web Clients, web navigator
- Cross reference
- Basic Process Control
- OPC - Open connectivity

**SIEMENS PLC - SIEMATIC STEP 7 PROFESSIONAL UNLIMITED FLOATING LICENSE**
- PLC PROGRAMMING
- NETWORK CONFIGURATION
- ONLINE AND DIAGNOSTICS
- HMI PROGRAMMING
- DRIVER CONFIGURATION

**GE FANUC SCADA - PROFICY HMI / SCADA - IFIX 5.5**
Capability Integration

- Fabrication Drawings
- Mechanical Engineering
- Process Control Engineering
- Civil Engineering
- Turnkey Projects
- Fabrication Workshops
- Mechanical Design & Fabrication
- Process Optimization
- Computational Fluid Dynamics
- Mathematical Modeling
- Plant Simulations

- Structural Engineering
- Process Control Engineering
- Fabrication Workshops
- Mechanical Design & Fabrication
- Turnkey Projects
PILOT LEVEL ACTIVITIES
Membrane Separation for Hydrogen
Methane Reformation
Unique Filtration System
Metal Dissolution System
Continuous Process Pilot Plant (1 kg/day)

COMMERCIAL SCALE ACTIVITIES
Medium Capacity Filter (9000 LPH)
10 kL Stirred Tank Reactor
Plug Flow Reactor (30 bar)
Vapor Liquid Separator (5000 kg/hr)

MINI PLANT ACTIVITIES
Soy Protein Plant

BASIC ENGINEERING DESIGN PACKAGE SOLUTIONS
10 TPD Soy Protein Project
10 TPD Biomass Processing Project
IMPLEMENTATION OF PROCESS AUTOMATION SYSTEMS

SYSTEMS DEPLOYED AT VARIOUS LOCATIONS:
• SIEMENS DCS PCS7 (S7 410H REDUNDANT) WITH ES-OS AND OS STATION
• SIEMENS SCADA WINCC V7.3 AND SIEMENS PLC CPU-1511
• SIEMENS PLC ET200S WITH GE FANUC SCADA IFIX-5.5
• SIEMENS PLC CPU 1214 AND SIEMENS HMI KTP400
• RENU ELECTRONICS PLC WITH HMI FP5070
• RENU ELECTRONICS PLC WITH HMI FP5043
• RENU ELECTRONICS PLC WITH HMI FP5070
• GE FANUC SCADA IFIX 5.5 WITH SELEC PLC AND HMI MM3010
• CONTROL PANEL DESIGN AND DEVELOPMENT

DOCUMENTATIONS PROVIDED FOR VARIOUS PROJECTS:
• PID
• INDEX SHEET
• IO COUNT AND TAG LIST
• DATA SHEETS FOR ALL FIELD INSTRUMENTS
• HOOK UP DRAWING
• LOOP CHECKING & FUNCTIONALITY CHECKING
• ALARM MANAGEMENT
• TOTALIZER
• LOGIC DIAGRAM (START UP & SHUT DOWN)
• BILL OF MATERIAL
• LOOP DRAWING
• CABLE SCHEDULE
• CONTROL PHILOSOPHY
• FAT
• SAT
• TRAINING PROCESS OPERATORS
IMPLEMENTATION OF ADVANCE PROCESS CONTROL

- pH control Loop
- Pressure Balancing Loop
- Temperature Control Loop
- Feed Concentration Maintainence Loop
- Mixed Stream Ratio Maintainence Loop
- Solid Flow Control Loop under Pressure
- Continuous Neutralization Loop
- Development of Soft Sensor and Controller
- Implementation of PWM logic for 0° Hysteresis
COMPUTATIONAL FLUID DYNAMICS (CFD)
*Using Fluid Physics to Design Process Equipment*

**Applications:**
Flow Distribution
Energy Efficient Mixing/Blending
Pressure drop, Drag prediction
Non-idealities in the reactors
Reactive Systems
Particle Dynamics (Gas-solid, liquid-solid)
Coupled Mass and Heat Transfer Processes

**Real Life Case Studies:**
Effect of Draft Tube
Effect of Coil position
Static Mixer Flow distribution
Coil Reactor Flow distribution
MECHANICAL SIMULATIONS

*Designing the Equipment Around the Process*

**Applications:**
- Stress Simulation
- Deflection Simulation
- Factor of Safety Simulation

**Real Life Case Studies:**
- Stirred Tank Reactors
- Coil Reactors
- Vapor Liquid Separators
DATA ANALYSIS

Applications:
Bubble Columns
COMPLEX PROCESS MODELING

Applications:
NOx GAS ABSORPTION

PUBLICATIONS:
• Modeling, simulation and optimization: Mono pressure nitric acid process
  (I. B. Chatterjee & J. B. Joshi)

• Role of nitrous acid decomposition in absorber and bleacher in nitric acid plant
  Chemical Engineering Journal, 155, 851-858, 2009
  (N. D. Ingale, I. B. Chatterjee & J. B. Joshi)

• Process intensification in manufacture of nitric acid: NOx absorption using enriched and pure oxygen
  Chemical Engineering Journal, 278, 430-446, 2015
  (V. G. Kankani, I. B. Chatterjee, J. B. Joshi & N. J. Suchak)
SIMULATED MOVING BED CHROMATOGRAPHY (SMBC)

Chromatography separation processes have been increasingly popular in the last decades. Implementation of such processes in the continuous mode has been feasible by means of technology of the simulated moving bed (SMB). This technology consists of an ingenious way of simulating the counter current of solid adsorbent relative to a fluid phase. The steps of adsorption or desorption, either by elution or displacement, occur simultaneously within the same phase of equipment. Some of the main advantages of this technology compared to conventional chromatography are enhanced productivity and less product dilution, even with low efficiency columns. Due to its operational complexity, the modelling, simulation, design, optimization and control of these processes are continuously challenging task.
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THANK YOU