Measure | Analyse | Control | Save

Solutions for your processes

Ease of Operation | Best Results

Tanker Loading Unloading System | Reactor Automation

Accuracy | Results

Layer Separation

Safety

Return On Investment

Efficient Aeration Control System

Contamination Leakage

Recovery

Preventive Measures

Level Measurement in Specialty Chemical

Quick Operation

Accurate Measurement

Chemical Batching System

Distillation Column Automation

Energy Conservation | Environment | Process Efficiency

www.forbesmarshall.com
Solutions for the Chemical Industry

The Chemical industry is one of the largest process industries, manufacturing a wide range of products from large volume petrochemicals and specialty chemicals, to the smallest fine chemicals. Thus, there is a wide scope for digitalisation.

Forbes Marshall solutions for process automation help the chemical industry keep up with emerging trends while keeping in mind the criticality of the various process, product quality and yield of the plant, irrespective of its volume. Our utility monitoring and control solutions provide information to help personnel take correct decisions at every stage and achieve maximum yield with minimum operating cost, thus keeping product cost in control.

The products and services that we provide help bring down the cost of utilities like steam throughout the process - from generation, to distribution and utilisation right up to recovery. By selecting the right boiler and optimising operating efficiency, one can substantially bring down the running cost of a plant. Solutions for recovering energy from hot condensate and flash steam help maximise condensate recovery and result in huge fuel savings.

With our years of expertise in control instrumentation solutions we help industry achieve better throughput, reduced process time, predictive maintenance and energy savings that eventually results in better productivity and reduced cost of operation.
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**Automation Solutions**

With our diverse industry experience and process knowledge, we help to improve quality, consistency and accuracy of your process. Understanding industry specific requirements, we provide complete turnkey solutions from design, detail engineering, drawing, documentation, supply, installation and commissioning of the simplest to most complex industrial processes. Our solutions cater to all requirements from complete plant automation to stand-alone packages that can help you optimise plant operations to deliver the desired product quality.

**Environment**

Industrial pollution is a major contributor to air and water pollution worldwide. Pollution monitoring equipment helps Industry comply with set norms and regulations and reduce environmental impact. Our range of water quality analysers for industrial effluent and sewage treatment plants help monitor important parameters like pH, BOD, COD, TSS etc. while high quality instruments for analysing of emission gases like SOx, NOx, CO2, O2, dust and velocity help measure and monitor emission parameters as per the pollution norms.

**Services**

Our vision is to provide services that contribute towards sustainability by continuously creating new benchmarks in building reliable and energy efficient utility systems for process industry by empowering people as change agents. Towards achieving this vision, our team of over 40 industry specialist engineers, zealously approach every assignment to set benchmarks in specific energy consumption and continuously better them.
Batch Automation System

Dispensing different organic and inorganic solvents used in process plants has always been a challenge. The inaccuracy in the dispensing of chemicals is a major factor that affects quality, safety and efficiency in chemical plants. It can cause heavy losses and also prove to be extremely hazardous.

Another aspect to be considered is the time required for material transfer from bulk storage tanks to the day tanks. In today’s age where results have to be quick and accurate, users can rely on our solutions to overcome such concerns.

Batch Reactor Automation

The chemical industry requires a large numbers of batch reactors for preliminary processing of chemical formulations and active desired ingredients. Accurate control of temperature and pressure profile during the reaction is critical. Control schemes have to be implemented for precise raw material addition, selection of utilities and special control algorithms for temperature control for multi-utility, multi-batch, multiproduct as such multipurpose application.

Customised control of various parameters like feed transfer, reactor holding time, mixing pH / conductivity, post reaction discharge control, reactor pressure and temperature and recipe management.

The Forbes Marshall Solution

Customised solutions as per user requirements complete with monitoring and control instruments from Forbes Marshall

Accurate measurement with application specific models

DCS/PLC controllers with open protocol

Fully upgradeable hardware and software
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Chemical Batching System and Batch Reactor Automation

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**Benefits**

1. **Quality**
   - Precise measurement, accuracy in operation

2. **Consistency**
   - Impeccable execution with every batch

3. **Safety**
   - Automated process to reduced human intervention

4. **Productivity**
   - Reduced losses and increased uptime with automated process

5. **Customer Specific Demand**
   - Secracy of ingredients and recipe management

6. **Cost to Production**
   - Batch cycle time reduction

**Customer Priority**

**FM Solutions**
Distillation is the most commonly used separation technique in the chemical industry. It consumes a large amount of energy, both in terms of cooling and heating requirements. Each type of distillation process has its own complexity and control loops associated with it, for increased recovery and higher throughput. It is imperative to use an appropriate control system designed considering the simplicity and criticality involved.

Precise control of various parameters like feed flow and temperature, column pressure, column level control, reflux control, reboiler temperature control and data logging and reporting are some of the solutions we provide.

**The Forbes Marshall Solution**

- Customised solutions as per user requirements for multi-component, multi-pressure or under vacuum with Forbes Marshall monitoring and control instruments
- Specialised control algorithms for mass and energy balance
- Cascade control systems with interlocks
- Facility to compensate for the dynamics of the process
- Fully upgradeable hardware and software

**Benefits**

- Higher throughput
- Consistent product quality
- Savings on utility costs
- Safety
- User flexibility
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**Benefits**

- Rising material and utility costs, coupled with increased global competition are forcing the industry to trim cost of manufacture and wastage through precise measurement and accurate delivery. Proper handling of incoming and outgoing chemicals can help achieve this. Industries need a safe and easy solution to handle these concerns and hence are adopting automated systems for loading and unloading of costly chemicals.

**The Forbes Marshall Solution**

- Stand-alone skid with out centralised dependability
- Complete instrumentation package including measuring and controlling instruments as per user requirement
- Customised package with remote switches or card reader facility
- User-friendly programme with facility to modify as per batch requirements
- Earthing detection for user/ plant safety with fail-safe alarms
- Data logging and report facility for inventory management

**Benefits**

1. Forbes Marshall skids for monitoring and controlling of unloading and loading of fluid
2. Level transmitter for fluid level monitoring
3. Flowmeter for monitoring the incoming / outgoing fluids.
Handling the wastewater output from a process industry, treating it before disposal and meeting stringent pollution board norms has always been a tedious task. Therefore, it becomes very essential to run the effluent treatment plant effectively to achieve the desired results as well as optimise the process so that the cost of operation is minimal.

**The Forbes Marshall Solution**

Complete automation packages for ETPs to ensure precise online monitoring of the effluent and control the treated water quality with energy efficient solutions.

AquaMax, an energy efficient DO based aeration control system that monitors and controls the dissolved oxygen levels with optimised operation of the aerator. It also helps reduce electricity bills as a direct benefit with a defined ROI period.

pH Monitoring and dosing system for the neutralisation pit of an ETP to control treated water quality

Flow monitoring of effluent at inlet and outlet of the ETP to keep a track of the incoming loads and outlet quantity

Multiparameter analysers for measurement of COD/BOD/pH/TSS for compliance to comply the PCB norms

**Benefits**

<table>
<thead>
<tr>
<th>Direct electrical energy savings in terms of reduced bills</th>
<th>Stabilized DO/COD and BOD levels</th>
<th>Maintenance free sensors for continuous monitoring</th>
<th>Reduced operational cost of ETP</th>
<th>Automated recording and reporting</th>
</tr>
</thead>
</table>
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Benefits

Direct electrical energy savings in terms of reduced bills
Stabilized DO/COD and BOD levels
Maintenance free sensors for continuous monitoring
Reduced operational cost of ETP
Automated recording and reporting

Cooling Tower Automation

Cooling towers are widely used across industries due to their optimal cooling technology. Shortage of raw water, combined with increased water usage, have increased the cost of makeup water requirements for cooling tower process. Hence there is a need to optimise the process considering the quality versus cost of operations for an effective cooling tower.

The Forbes Marshall Solution

Our cooling tower automation solution helps reduce operating costs as well as maintain the quality of cooled water and ensure upkeep of the process. The package caters to the following parameters, which can be offered in totality, or as per user requirements, and upgraded when required.

Temperature based cooling tower fan/motor control to maintain the desired Delta values
TDS based blowdown control to avoid further damage to the process due to high TDS levels water
pH monitoring with chemical dosing to ensure good quality of cooling water
Flow monitoring and level based control of make-up and process water to help maintain the process requirements
Continuous vibration monitoring of motors and pumps helps keep track of equipment health and avoids unplanned shutdowns with our predictive analysis system.

Benefits

Energy savings
Reduction in consumption of make-up water
Maintained quality of water
Predictive maintenance
Low operating cost
Compressed air is a very important utility in a process plant. Hence, maintaining the compressed air generation and distributing as per the user demand is of vital importance. Any losses at the user point or in the distribution line and fluctuating demand can cost a lot in terms of recurring shut downs and maintenance cost.

The Forbes Marshall Solution

Forbes Marshall provides complete monitoring and demand based control solutions for the compressed air generation and distribution network.

**Free Air Delivery** monitoring using our FAD meter, a vortex type flow meter, equipped with temperature and pressure compensation facility. It is the most accurate and effective way to measure and monitor compressor efficiency and health.

**Master Air Controller** (MAC) is an energy saving control system which actively helps control the balance across the demand and supply sides. Peaks in the demand side are handled by the MAC, allowing compressors to run smoothly, thus saving energy and ensuring better life.

**AirMon**, an innovative and cost-effective solution for monitoring of compressed air on the distribution lines. It makes data available with minimum hardware/electronics without compromising on accuracy, reliability and durability. Its online pressure and temperature compensation makes it the most practical solution that helps to tally the compressed air usage at the distribution side.

**Benefits**

<table>
<thead>
<tr>
<th>Energy savings, electricity bill reduction</th>
<th>Consistent air pressure delivery</th>
<th>Zero leakages/losses</th>
<th>Predictive maintenance</th>
<th>Low operating cost</th>
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</table>
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Benefits

Energy savings, electricity bill reduction
Consistent air pressure delivery
Zero leakages/losses
Predictive maintenance
Low operating cost

Layer Separation

Separation of a mixture of different chemicals has always been a challenge for a user in the process industry.

Our Solution

A fully automated system with a stand-alone controller and specialised valves can help the user separate such layers based on the measurement of conductivity or density. It provides application to the process without manual intervention.

Level Measurement in Specialty Chemicals

Liquid level measurement in media that contain dense fumes or vapours is a challenge. Increased levels can lead to a hazardous environment, accurate monitoring is necessary for the safety of both the system and the surroundings. Level measurement and monitoring also helps in inventory and stock management.

Our Solution

Our wide range of level measuring instruments provide reliable solutions for level measurement of such specialty chemicals in safe as well as hazardous area applications.

O₂ Monitoring

Oxygen being an inert gas is widely used in process industry for various purposes and hence accurate monitoring is very important for the process.

Our Solution

AirMax is a O₂ monitoring system that offers precise monitoring capabilities to the lowest level of O₂. It is a robust solution, suitable for both safe and hazardous area applications with options to select the sensors accordingly.

Leakage Detection

Presence of unwanted media in a process may prove to be extremely hazardous or may degrade the product quality of the application. Therefore timely detection of such unwanted media has to be facilitated, to avoid unnecessary circumstances.

Our Solution

Our online measurement solutions for parameters like TOC, COD or conductivity can help in timely detection of such unwanted media and detect contamination or leakages by knowing the shift in such analytical parameters. Application specific product can be selected as per user requirements.

Product Offering

<table>
<thead>
<tr>
<th>Sections / Products</th>
<th>Chemical Batching system</th>
<th>Batch Reactor</th>
<th>Distillation Column</th>
<th>Tanker Loading/Unloading</th>
<th>Cooling Tower</th>
<th>Raw Water</th>
<th>DM Plant</th>
<th>RO Plant</th>
<th>Purified Water</th>
<th>ETP</th>
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<td>Electromagnetic Flowmeter</td>
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<td>Variable Area Flowmeter</td>
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<td>Vortex Flowmeter</td>
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<td>Ultrasonic Flowmeter</td>
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<td>Level Transmitter</td>
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<td>Control Valve</td>
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<td>pH analyser</td>
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<td>Conductivity Analyser</td>
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<td>ER PLC, DCS, RTU System/SCADA System</td>
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Productivity

Reliability
Energy Efficiency

Icon Key
### Seven Decades of Process Solutions

We have created an efficient business by integrating our knowledge, services and technology to provide smarter solutions. Our installed base stands testimony to this.

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow Meters</td>
<td>130,000+</td>
</tr>
<tr>
<td>Analyzers</td>
<td>2,25,000+</td>
</tr>
<tr>
<td>Gauges</td>
<td>18,00,000+</td>
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<tr>
<td>Steam and Water Analysis</td>
<td>1500+</td>
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<tr>
<td>Steam Traps</td>
<td>30,00,000+</td>
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<tr>
<td>Control Valve</td>
<td>80,000+</td>
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<tr>
<td>Vibration Monitoring System</td>
<td>5000+</td>
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<tr>
<td>Dust and Gas Monitoring System</td>
<td>4000+</td>
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<tr>
<td>Boilers</td>
<td>3600+</td>
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<tr>
<td>Pressure Reducing Stations</td>
<td>35,000+</td>
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<tr>
<td>Condensate Pump</td>
<td>10,500+</td>
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</tbody>
</table>

Contact us at coremktg@forbesmarshall.com or scan the QR code.