Paper and Corrugated Board Industry
Steam and Process Control Solutions
For over 70 years, we have partnered the industry in providing solutions in control instrumentation, energy conservation and environmental monitoring. Our teams of the finest engineers are dedicated to serve process industry across diverse sectors. World class manufacturing facilities and technology enable us deliver quality solutions globally. Our unique complimentary expertise enables us engineer customised systems that improve manufacturing processes, conserve energy and are environmentally sustainable. We partner customers with our knowledge, comprehensive range of services, products and solutions for utilities and process control.
Energy Services for the Paper Industry

Forbes Marshall provides services to help build reliable, energy efficient utility systems for the process industry thereby achieving new benchmarks.

1. Basic and Detail Engineering
2. Project Management
3. Steam System Design Hazop
4. Cogen Feasibility and Engineering
5. Stress Analysis
6. Process Energy Optimisation with Automation
7. Steam System Training
8. Energy Audits
9. Safety Audits
10. De-bottleneck Audits
11. Energy Management System Audits
12. Steam System Management

The Energy Conservation Triangle - Prioritising Improvements in the Paper Industry

- Next Practices
  - 5% Hoods, Quality control systems
- Optimising Efficiency
  - 3% Monitoring moisture control
  - 4% Boiler Efficiency
- Stopping Wastages
  - Condensate recovery
  - Flash Recovery
  - Steam Conditioning, Isolation Valves
  - Pressure Control, Rotary Joints & Syphons, Traps / Blow-Through
  - 10%
<table>
<thead>
<tr>
<th>Forbes Marshall Helps in Reduce Energy Consumption</th>
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<tbody>
<tr>
<td>The Forbes Marshall thermocompressor and cascade based steam and condensate system resulted in improvement of drying rates by 15% and ramped up machine speed by 33% from 200 mpm to 300 mpm. The productivity improved from 110 TPD to 170 TPD with reduction in specific steam consumption from 2.8 kg of steam/ kg of paper to 1.6 kg of steam / kg of paper.</td>
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<tr>
<td><strong>A Leading Paper Mill in Egypt</strong></td>
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| The Forbes Marshall thermocompressor, stationary syphons and condensate recovery system resulted in improvement of drying rates and helped achieve specific steam consumption of 1.25 ton/ton of paper with machine speeds ramped upto 350 mpm. Drying rates of 18-21 kg/h-sq.m which is in line with TAPPI standards. Condensate recovery factor of 93% achieved. |
| **Paper and Pulp Mill in West India** |

| The Forbes Marshall steam trap based steam and condensate system resulted in improved surface temperature of dryers from 90 °C to 115 °C. Machine speed ramped by 30% from 70 mpm to 100 mpm. Productivity improved from 45 TPD to 70 TPD with reduction in specific steam consumption from 230 liters of LDO / Ton of paper to 160 liters of LDO /Ton of paper. |
| **Pulp and Paper Mill in Egypt** |

| Installation of float trap and temperature control system on hot plates and drying cylinders helped reduce the specific steam consumption by 15%. We were also able to improve the quality of board with lower rejections by maintaining the gel point in the desired range. |
| **A Leading Corrugated Board Manufacturer in North India** |

| Design of steam and condensate loop by Forbes Marshall has helped us achieve complete heat and mass balance and a specific fuel consumption of 22 lit of furnace oil per ton of paper. |
| **A Leading Board Manufacturer in South India** |

| We achieved a saving of 12% in our fuel bill by replacing water logged traps and recovery of condensate back into feedwater tank. The flash steam is used in steam shower which has given an additional saving of a percent in annual fuel bill. Our overall makeup water consumption has also reduced by 22%. We thank Forbes Marshall for their inputs and engagement to help us achieve savings. |
| **A Leading Corrugation Manufacturer in South India** |

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