Maximize availability while reducing operating and maintenance costs. The Outotec OKTOP® Autoclave offers reliability, delivers optimal metal recovery performance, and is backed by a strong proprietary equipment portfolio for complete plant unit deliveries. We use our own testing facilities with pilot autoclave for process development and a wide range of testing. In addition, Outotec also offers a range of proprietary equipment for other critical duties in autoclave plant unit such as feed tanks, flash vessels and gas cleaning scrubbers.

**BENEFITS**

- Leverages Outotec’s process know-how and a holistic view of the wider process
- Includes detailed material selection and testing capabilities
- Includes process guarantees, depending on case
- Outotec OKTOP® agitator for autoclaves with optimized performance
- Full pre-designed plant unit deliveries available for Autoclave plant units
Outotec OKTOP® Autoclave

Autoclave dimensioning is based on process requirements, with the size selected specifically to achieve the required process results. The internals such as lining, compartment walls and dip tubes, are implemented for high uptime and durability as well as safe maintenance procedures. Our modular design principle allows for flexible implementation and enables the use of productized components, offering reliable consistency and avoiding mistakes often made in one-off designs.

As part of our Outotec life-cycle services offering our customer’s have access to our spare parts eCatalogue with an interactive structure for exploring equipment spares, autoclave inspections and process troubleshooting among other service offerings.

Outotec OKTOP® Autoclave Agitator

Outotec offers tailored agitators available to fulfill process requirements in different pressure operations. Our designs are proven to overcome the common problems in agitation of autoclaves such as high wear and scaling. Critical components such as sealing have been selected and customized to optimize operation, availability and the maintenance process in the plant. State of the art design methods from CFD modelling of agitation patterns to FEM calculation methods to ensure fatigue resistance are utilized to develop the agitator and to ensure optimal process results.

<table>
<thead>
<tr>
<th>Operational Benefits with Same Gas Insert Amounts</th>
<th>When Using OKTOP 2200 Agitator Compared to Rushton Agitator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor efficiency, required power</td>
<td>~14%</td>
</tr>
<tr>
<td>Lower tip speed</td>
<td>~20%</td>
</tr>
<tr>
<td>Longer part life time, with equal mass transfer rate</td>
<td>+22%</td>
</tr>
</tbody>
</table>

Total Autoclave plant unit delivery

For a complete autoclave circuit Outotec offers proprietary equipment for all main auxiliary equipment including:
• Feed Tank
• Pre-Heater
• Flash Vessel
• Blowback Vessel
• Gas Cleaning Scrubber

Our feed tank with OKTOP® Agitators provides a controlled environment with sufficient storage and flexible live volume for smooth operation of the Autoclave. Our agitator is designed to provide homogenous slurry mixing and efficient operation. The operation can be further enhanced with OKTOP® SandSense process monitoring probe to detect solids accumulation while enabling agitator rotational speed optimization.
Outotec is able to provide a full range of proprietary equipment for the pressure leaching circuit.

A Pre-Heater heats the slurry before it enters the Autoclave using steam from the Flash Vessels. This considerably reduces the heating of incoming solution as well as reducing exhaust gas.

Flash Vessels decrease the pressure and temperature of slurry that comes from the Autoclave in a controlled manner. Proper sizing of the Flash Vessel is essential to ensure smooth operation of the process and avoid overloading gas cleaning with solids. Steam is directed to the Gas Cleaning Scrubber, either directly or via the Pre-Heater. All exhaust gases are treated in the Scrubber. Our Ejector-Venturi Scrubber is utilized with negligible pressure loss to the gas line. Our Scrubber is specifically designed to operate in the Autoclave process with special attention to the high solids content sometimes present in the Autoclave exhaust line.

Automation and instrumentation may also be included in Autoclave Unit delivery. Likewise, digital additions such as intelligent oxygen management systems can be included.
LIFE-CYCLE SERVICES FROM PROCESS DEVELOPMENT TO PLANT OPERATIONS

Outotec services provides life-cycle support for your plant to ensure the best possible results from your operation. Our offering include pre-delivery services such as test work, process design, engineering, start-up phase services such as installation and commissioning advisory, training packages and operational phase services such as spare part solutions, maintenance services, process advisory and equipment inspection services. During the construction phase installation and commissioning support is available to ensure smooth and safe progress of installation and start-up.

Outotec Autoclave, quality in delivery
Quality of the delivery is ensured throughout the project from development phase to final completion. Our Outotec materials group supports from the outset on selection of materials and by utilizing our unique database including both laboratory and site measurements and test results. Productized quality documentation and procedures fulfil all standards requirements and ensure a high quality delivery to meet statutory and legal compliance. Outotec supplies equipment manufactured according to ASME BPVC standards. Harmonized EN standards meeting PED requirements are also used if required. Our project implementation teams have a wealth of experience on multiple autoclave delivery projects for smooth execution with expediting done by in house experienced and fully trained inspectors for welding and NDT inspections.

Outotec offers the complete autoclave process island delivery including both mechanical and process performance guarantees complemented with extensive expert services. Our holistic design and decades of process experience make for an unrivalled safety and peace of mind by eliminating design problems in complex interfaces between equipment.