Case Study

Sartoclear Dynamics® Lab for Improved Efficiency of Cell Culture Clarification

For customers harvesting biomolecules from cell culture media, Sartoclear Dynamics® Lab provides a rapid alternative to conventional clarification. Utilizing a filter aid, customers can achieve complete cell removal and sterile filtration in a single step. By eliminating lengthy centrifugation and high consumable requirements, this allows them to enjoy significant time and cost reductions, without impacting quality or yield.

**Challenges**
- Limited throughput due to time-consuming, multi-step process
- Risk of contamination due to pseudo-sterile filtration
- Lab space constraints and high plastic waste generation

**Provided Solution**
- Introduced single-step, centrifuge-free clarification process
- Efficient cell removal and true sterile filtration with Sartoclear Dynamics® Lab
- Demonstrated increased throughput with Sartolab® Multistation
- Reduced investment and operation costs for centrifuges, lab space and single use plastic waste

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**Before**
Centrifugation and particle removal
- Batch Volume: 1,000 mL
- Centrifugation: 45 min
- Filtration: 3 x 0.45 µm
- Total process time: 1 hour

**After**
Sterile, dynamic body feed filtration
- Batch Volume: 1,000 mL
- Centrifugation: none
- Filtration: 1 x 0.22 µm + DE
- Total process time: 10 min

**64% Savings**
on annual costs, including instruments, consumables, lab space and labor

**>4-Fold Increase**
in throughput with Sartolab® Multistation

**80% Reduction**
in number of single-use consumables

**Easy Integration**
with no significant investments needed to implement Sartoclear Dynamics® Lab

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Case Profile

**Company Type:**
Mid-sized biotech company engineering biomolecules for diagnostics and research.

**Related Molecule:**
Recombinant antibodies.

**Related Application:**
Harvest of antibodies from mammalian cell cultures with dynamic body feed filtration.
Total Cost of Ownership (TCO) Analysis

Application: Harvest of antibodies from mammalian cell cultures with dynamic body feed filtration.
Scale: Annual production volume of 3,000 × 1,000 mL cell cultures.
Sartorius: Cell culture clarification and sterile filtration with Sartoclear Dynamics® Lab kits and Sartolab® Multistation.

Cost Benefits

- Saving two centrifuges valued at €20,000 each, assuming 10 years of use; and €500 annual service costs.
- Saving 2 m² of lab space usually used for centrifuges. Based on actual rental costs of €430 per m² per year.
- Saving consumables spending through a reduction from 3 to 1 filtration devices per batch and no ongoing requirement for centrifuge bottles. Based on actual consumable list prices.
- Saving on labor costs with no need for 750 × 45 min centrifugation runs per year and a 4 min filtration time saving per batch. Based on assumed labor costs of €100 per hour.
- Saving on waste disposal costs due to 80% reduction in the number of single use consumables needed.

<table>
<thead>
<tr>
<th></th>
<th>Sartorius</th>
<th>Conventional</th>
<th>Savings</th>
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</thead>
<tbody>
<tr>
<td>Total Material Cost per Year</td>
<td>€95,670.00</td>
<td>€209,440.00</td>
<td>€113,770.00</td>
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<td>Hardware</td>
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<td>Servicing</td>
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<td>Lab space</td>
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<td>€1,720.00</td>
<td>€1,290.00</td>
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<tr>
<td>Consumables</td>
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<td>Total Labor Cost per Year</td>
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<td>€68,750.00</td>
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<td>Waste Disposal Costs per Year</td>
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<td>TCO per Year</td>
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<td>€287,590.00</td>
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<td>TCO per Batch</td>
<td>€34.29</td>
<td>€95.86</td>
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