PRODUCT SHEET

MAGic™Accio PROCESS

Product description

Product name
MAGic™Accio PROCESS

Product use
MAGicAccio PROCESS series comprises fully automated large-scale magnetic-based separator systems, designed for large-scale product recovery from unclarified cell-cultures. The system enables single-step clarification and purification utilizing the proprietary MAGicAccio PROCESS unit in combination with our MAGicBeads, allowing the processing of up to kilogram quantities of proteins or antibodies per purification cycle.

Depending on the intended production scale, as determined by the maximum bead capture capacity, each MAGicAccio PROCESS unit is engineered with an optimized ratio between the reactor tank, bead column, and magnet chamber, ensuring maximum operational efficiency while maintaining a compact system footprint.

Product number
3100

Cost
On request

Product information

Product	MAGicAccio PROCESS
Operation procedures	Automatic purification system for integrated clarification and target capture
Bead capacity	1-40 L settled beads depending on scale of system
Magnetic field strength	0.6 Tesla
Main components	Reactor tank, glass column, magnet chamber
Components and piping	Stainless steel (316L), polishing grade Ra 0.5 µm
Pumps	2 pumps; peristaltic product pump and high-capacity CIP pump
pH stability, operational	2-14 (no HCl)
pH stability, long-term	3-14
Sensors	UV meter, conductivity meter and pressure sensor
Cleaning	Regular cleaning-in-place (CIP) using 1 M sodium hydroxide is recommended.
Related products	MAGicBeads are fully validated for compatibility with the MAGicAccio PROCESS. Their enhanced magnetic properties enable highly efficient and reliable separation.



MAGicAccio PROCESS magnet chamber serving 1-40 L. of settled beads.

"MAGicAccio PROCESS is the world's first truly scalable magnetic separation system, designed specifically for large-scale manufacturing of biologics based on magnetic separation, thereby enabling implementation of the process improvements and cost advantages."

All MAGicAccio PROCESS systems are custom engineered to meet specific product output requirements. In a smaller configuration with a maximum bead capacity of ≥1,000 mL, corresponding to a 1.7-L column volume and a 35-L reactor tank volume, the system can isolate up to approximately 1 kg of monoclonal antibodies within 24 hours.

To achieve higher IgG yields, such as >1 kg of purified IgG per day, an increase in system scale is required. The primary limiting factor is the maximum binding capacity of the beads within the magnet chamber; therefore, this component must be scaled proportionally along with other system elements in an optimized ratio. Conversely, when IgG titers are low, the reactor tank volume may become the limiting parameter, necessitating expansion to reach the desired production output.

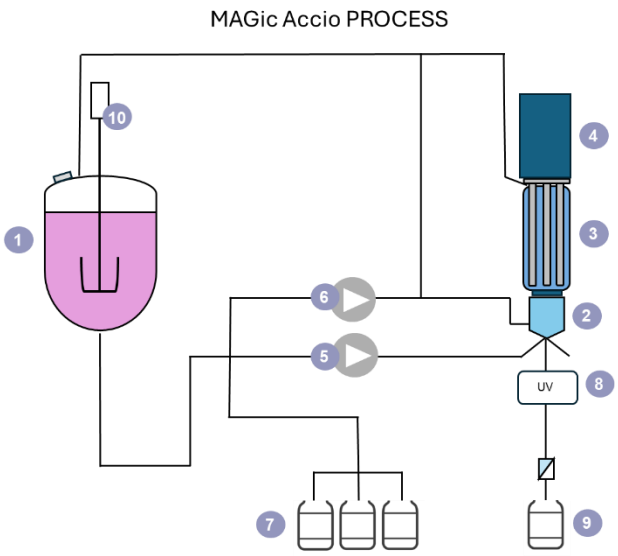
The MAGicAccio PROCESS platform is highly scalable, supporting configurations from 1 to 40 liters of beads, corresponding to approximately 45 g up to 1.8 kg of IgG per purification cycle across different system scales.

A wide range of biomolecules can be purified using MAGicBeads in combination with the MAGicAccio PROCESS, for instance proteins, including antibodies, and emerging therapeutic modalities such as viral vectors and mRNA. For certain processes, the integration of single-use components can be advantageous, and systems can be customized to incorporate such configurations wherever feasible.

System overview

The following section describes the interconnection of the system components. The flexible system architecture allows each unit to operate either in series or via bypass, depending on process requirements. The product pump provides gentle bead handling to preserve functional integrity, while the high-capacity pump supports operations that require elevated flow rates. Elution at the end of each cycle is performed under controlled pressure to ensure consistency and product quality. Collectively, these design features enable rapid, efficient, and highly reproducible purification workflows.

The figure below presents the primary system components and an overview of the flow path, illustrating the versatility of the MAGicAccio PROCESS. Additional modules and add-on features can be integrated into customized system setups to meet specific production needs.



#	ID	Description
1	Mixing tank	Place of absorption of product to beads
2	Glass Column	Bead bed is consolidated in elution step
3	Magnet Chamber	Magnetic beads bind to activated magnets
4	Magnet Holder	Holder for inactive magnets
5	CIP pump	High-capacity pump
6	Product pump	Peristaltic pump
7	Media inlet ramp	Inlets for buffers and other solutions
8	UV sensor	Detection of UV signal during elution
9	Product outlet	Collection of filtered eluate
10	Agitator	To get an even feed-bead solution

PSS-31XX

Sensors

By default, the system is equipped with a UV sensors (single wavelength) positioned downstream of the column and along the recirculation pathway, as well as a conductivity meter. Additional sensors or other components can be incorporated upon request.

Monitoring conductivity is essential both for controlling the various operational units and for verifying complete removal of sodium hydroxide during Cleaning-in-Place (CIP) procedures.

Pressure sensors play a critical role in the system, as both bed consolidation and elution are performed under pressure. To prevent damage to the beads, controlled, gentle pressure is applied. Additionally, safety valves are installed to protect the system components from overpressure.

Improved product output compared to the conventional setup

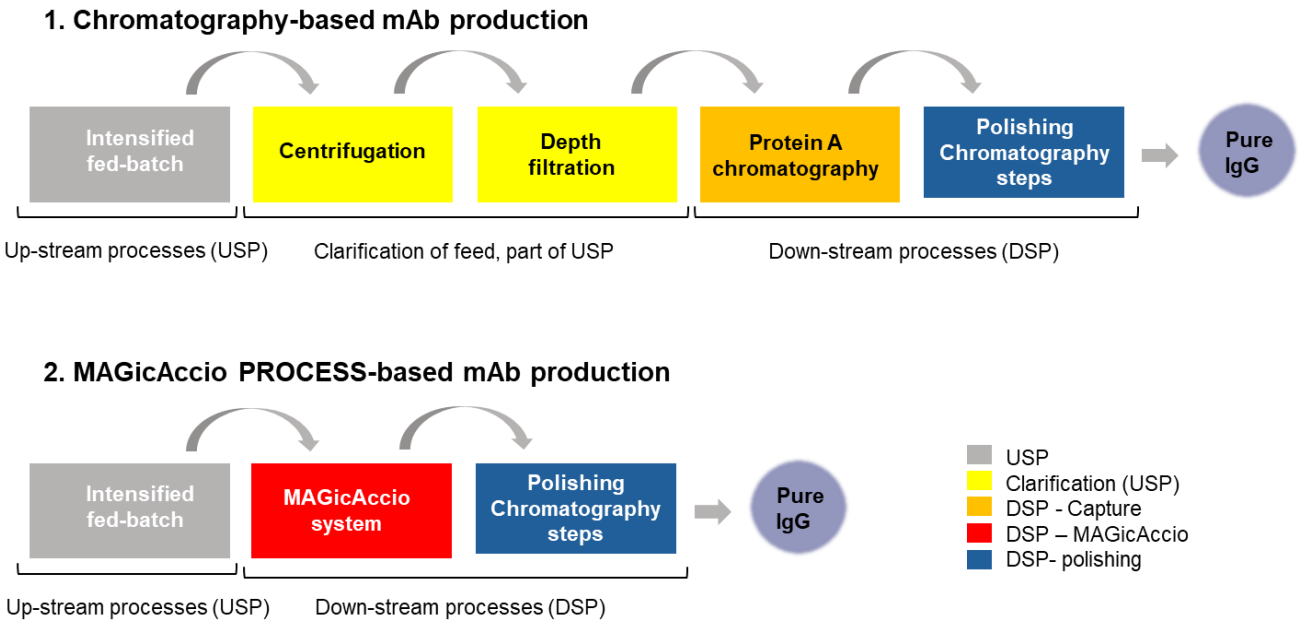
New process-intensification methods in monoclonal antibody (mAb) production have greatly increased the amount of product made during upstream processing (USP). These improvements often lead to very high cell densities and high product levels. However, many standard clarification methods cannot handle these dense cell cultures well. This can cause poor product recovery and large yield losses during downstream processing (DSP). As a result, much of the productivity gained in the USP is lost because clarification has become a major bottleneck in traditional chromatography-based processes.

The MAGicAccio PROCESS system helps solve this problem by linking parts of the USP directly with the first capture step in DSP. It uses magnetic beads to separate the product from the cell culture, which removes the need for the usual clarification and filtration steps. This simplifies the workflow and improves overall productivity. See Figure below for the simplified MAGicAccio PROCESS setup compared to the traditional chromatography-based setup for mAb manufacuring.

It has been demonstrated that the MAGicAccio PROCESS system offers several advantages compared with traditional purification setups that require clarification steps prior to capture chromatography.

MAGicAccio PROCESS:

- Improved overall process yield
- High output
- Less manual handling
- Faster
- Improved cost-of-gods (GOGs)
- More stable and reliable process
- No process stops due to clogged filters



Bead-system compatibilities

It is essential that bead performance remains uncompromised when scaling from laboratory operations to full bioprocessing using the MAGicAccio PROCESS system. MAGicBeads are designed for bioprocess conditions, exhibiting high binding capacities, are super paramagnetic with no aggregation issues and tolerate harsh cleaning conditions and are therefore highly compatible with our MAGicAccio PROCESS systems.

MAGicAccio PROCESS - Key advantages

- Gentle bioprocess conditions
- Circumvent clarification steps
- Integrated system, less manual handling
- Improved process outputs
- Scalable
- Sustainable

"MAGicAccio PROCESS brings magnetic precision to bioprocessing, integrating USP and DSP for a streamlined, scalable workflow that elevates efficiency and protects product quality"

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