

Corning® Ascent® Fixed Bed Reactor System 100

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Actual instrument component appearance may differ from images.

The Corning Ascent FBR system is a versatile platform designed to support cell and gene therapy workflows specifically for applications that require adherent cells. The Ascent FBR System 100 utilizes the same reactor technology as the Ascent FBR System 5, providing linear scalability from 1 m² to 100 m². The ability to harvest viable cells allows its application in both seed train and larger scale manufacturing processes, including clinical stage manufacturing. With three single-use Ascent FBR sizes (20 m², 50 m², and 100 m²), it supports the ongoing development of a stable and well-defined manufacturing process, either from the smaller-scale Ascent system or other adherent platforms.

The Corning Ascent FBR System 100 is an automated, perfusion bioproduction platform for attachment-dependent cell-based processes. The large surface area of the bioreactors along with pre-sterilized, single-use consumables enable flexibility and faster turnaround time for large-scale manufacturing applications. The system is cleanroom compatible for seamless incorporation into a production environment and was designed to be easily integrated into an existing DeltaV™ distributed control system for real-time monitoring, dynamic process control, and smooth data transfer. Within the distributed control system, the Ascent FBR System 100 can be operated as a standalone system, while maintaining a unified view of all equipment within the overall production setting.

Features and Benefits

Specially treated woven mesh polymer substrate	• Uniform fluid flow – efficient nutrient delivery and waste removal • Uniform cell growth – beneficial cell distribution and confluence at transfection • Improves cell health and product yield
FBR designed to harvest viable cells with >90% recovery	• Enables its use in other application workflows that require cell recovery for downstream use • Enables the FBR to be used for seed train, streamlining vessel-to-vessel cell transfer
Bioreactor scalability	• Three FBR sizes available: 20 m², 50 m² and 100 m²
Platform scalability	• Critical process parameters can be scaled directly from the Ascent FBR System 5 protocol to the System 100 resulting in reduced process transfer times and minimal optimization at the larger scale • Productivity (per cm²) can be scaled from the Ascent FBR System 5 resulting in consistent performance during scale-up
Separate media conditioning vessel (MCV)	• Provides flexibility in media volume and dilution strategy for transfection reagents prior to addition
Automated control, including disposable sensors that monitor DO, pH, temperature	• Reduced labor costs, hands-off operation, reduced risk of human error • Redundant pH and dissolved oxygen sensors for robust process control
In-line metabolite monitoring	• Redundant sensors to monitor glucose, lactate, glutamine, and glutamate • Real-time biomass prediction capability
Ready to use, irradiated consumables	• Minimal set-up required, including single-point calibration. No autoclaving necessary. The minimal setup required can save many hours of valuable time
Closed system	• Aseptic connectors or tube welding allow for easy aseptic installation and addition of consumables in the open lab or cleanroom setting
Cleanroom compatible	• Cabinets are 316L SS and meet the following industry standards: NEMA Type 3R, 4, 4X, 12 and Type 13; UL Listed Type 3R, 4, 4X and 12; CSA Type 4, 4X and 12; IEC 60529; IP 66
Designed for straightforward integration into existing control systems	• The Ascent FBR System 100's PK controller can be integrated into a SCADA system by seamlessly merging it into a larger DeltaV distributed control system, effectively acting as a single, native database within the wider SCADA network, eliminating the need for complex data mapping between separate systems. This allows for smooth data transfer and control of smaller, standalone unit while still maintaining a unified view within the overall SCADA platform.

The Corning® Ascent® FBR System 100 consists of a Controller skid with Human-Machine Interface (HMI) (Figure 1), MCV skid, Reactor skid (Figure 2), and single-use, irradiated components including a fixed bed reactor (FBR), a media conditioning vessel (MCV), and other single use consumables, including tubing with associated connectors, probes, multi-purpose bags, and in-line sensors. Additional consumables are also available to support cell harvest and custom reactor coating processes.

During cell culture, a recirculation pump circulates media from the MCV through the FBR and back into the MCV. Separate pumps aid in removing depleted media from the MCV and replacing it with fresh media during media addition, removal, and exchange phases. Cell culture pH and oxygen levels are automatically controlled and maintained using sparging gas composition and a base pump, while an external temperature control unit maintains consistent temperature in the MCV. The culture media can be sampled to determine metabolite levels, and these levels can be controlled by performing a refeed step, perfusion, or by adding a feed supplement. At harvest, three different automated options are available to support various applications (Cell Harvest, *In Situ* Lysis, and Media Collection).

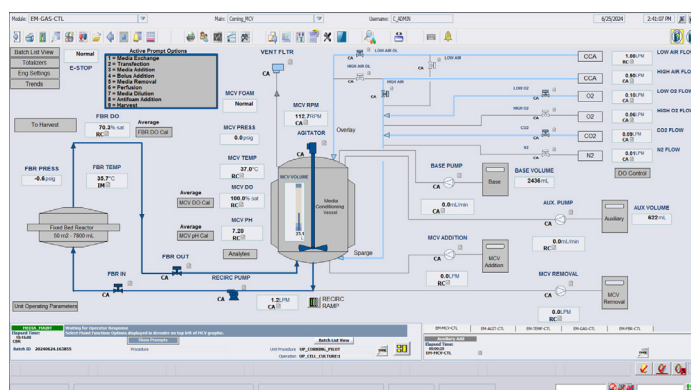


Figure 1. The system is operated using a touchscreen human-machine interface.

Main Components



Figure 2. Corning Ascent FBR System 100 (Cat. No. 6670), see Table 1.

Table 1. Main system components.

Label	Component
1	Ascent FBR System 100 Reactor skid
2	Fixed bed reactor (FBR)
3	Ascent FBR System 100 MCV skid consisting of a 50L DynaDrive
4	Ascent FBR System 100 Controller skid

Site Requirements

Type	Description
Operating Conditions	• The instrument is designed for use under standard operating conditions per UL 61010-1 where: - Indoor temperature range is 5°C to 40°C - Maximum relative humidity at 80% for temperatures up to 30°C - Up to IEC Overvoltage Category II for transient over voltages - Product is designed for connection to an electrical branch circuit inside a building with main supply voltage fluctuations not exceeding ±10% of the nominal voltage - Maximum altitude up to 2,000 m - Pollution degree 2
Space Requirements	• The system is comprised of multiple elements requiring a total of 101 x 57 x 91 inches (W x D x H). The workspace shall be sized to allow additional space for consumables such as media drums and harvest bioprocess bags. • The power disconnect switch located on the left panel of the Controller skid must be accessible and unobstructed.
System Weight	• Ascent FBR System 100 Controller skid: approx. 400 lbs. • Ascent FBR System 100 Reactor skid: approx. 400 lbs. • Ascent FBR System 100 50L DynaDrive™: approx. 350 lbs. • Ascent FBR System 100 50L TCU: approx. 250 lbs.
Power Requirements	• Ascent FBR System 100 Controller, Reactor and MCV skids: 208V 3 Phase 50/60Hz 30A, 5 wires to Controller skid • Controller skid has a bulkhead opening for connection to mains power • TCU: 230V single phase; dedicated 40A circuit • Recommended power cables: The Controller skid must be connected to the protected earthing via the mains power source
Gas Connections	• The instrument air supply required for pneumatic valve control is 90 PSI. Mass flow controllers (MFCs) for cell culture gases are rated for 30 to 35 PSI (air, O₂, CO₂, N₂). Required connection type is ¼ inch (6 mm) OD semi-rigid flexible tubing for inlet push connectors. • Only clean, dry and oil-free compressed air must be used.
Communication	• Ethernet/IP.

Ordering Information

Corning® Ascent® FBR System 100

Cat. No.	Description	Qty/Cs
6670	Ascent FBR System 100, 208V	1

Corning Ascent Bioreactor Consumables

Cat. No.	Description	Qty/Cs
6671	Ascent FBR 20 m² bioreactor	1
6672	Ascent FBR 50 m² bioreactor	1
6673	Ascent FBR 100 m² bioreactor	1



Corning Ascent Consumables and Accessories

Cat. No.	Description	Qty/Cs
6674	Ascent FBR System 100 Media Harvest tubing set with glucose sensor	1
6675	Ascent 10L Solution bag	4
6676	Ascent 10L Waste bag	4
6677	Ascent 20L Solution bag	4
6678	Ascent 20L Waste bag	4
6679	Ascent 20L Collection bag	4
6680	Ascent 50L Solution bag	4
6681	Ascent 50L Waste bag	4
6682	Ascent 50L Collection bag	4
6683	Ascent FBR System 100 50L DynaDrive™ bag	1
6686	Ascent FBR System 100 Y Accessory	4
6687	Ascent FBR System 100 Bidirectional Media Harvest tubing set with glucose sensor	1
Service	Description	
6685	Ascent FBR System 100 Installation and SAT	



To learn more or request a demo, visit www.corning.com/ascentfbr.

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