

CHROMATOGRAPHY Bio-Rad[®] GelTec[™] Process Chromatography Columns

- Closed system design
- Ideal for dense media
- Adjustable height adaptor with central screw mechanism
- High packing efficiency
- Documentation for regulatory submissions
- Customizable diameter up to 2 m

Integral Clean-in-Place Design With Optimized Performance

Bio-Rad GelTec process-scale chromatography columns are designed for industrial applications and allow contained filling, packing, unpacking, and cleaning in place. The Bio-Rad GelTec column design has a sanitary design, variable height adaptor, inflatable seal, and retractable bottom end piece.

The Bio-Rad GelTec adaptor and bottom end piece have many innovative design elements that provide significant benefits, such as increased column performance, added ease of use, and a higher level of security.

The columns' sanitary design ensures hygienic performance and thorough cleaning. All Bio-Rad GeITec columns come with a complete set of regulatory support documentation.

From pilot to manufacturing scale, Bio-Rad GeITec columns are directly scalable, preserving the same general design. These columns are available in many standard sizes, or the columns may be customized to any length up to 1,200 mm or any diameter up to 2 m. Scale and scope of a project will seldom pose constraints. Bio-Rad GeITec columns are available with glass, stainlesssteel, or acrylic column tubes.

Cleaning-in-Place System

The unique design of the Bio-Rad GelTec column enables:

- Contained unpacking before cleaning cycles are started
- Cleaning in place of the chromatography column
- Cleaning in place of chromatography media





General Handling

To pack the column, the variable height adaptor is raised to its highest position, and slurried medium is gently pumped through the inlet valves. These specially designed low-shear valves minimize damage to chromatography media during transfer. The column is then flow-packed, axially compressed, or both, for optimal bed packing. The column is unpacked after retracting the bottom end piece, creating a void below the packed bed, and exposing the cleaning jets. Buffer is again pumped through the inlet valves to break up the bed and reslurry the medium. The slurry exits the column through the outlet valves.

Spray jets (below the retractable bottom end piece and on the upper adaptor above the inflatable seal) enable contained cleaning. The powerful jets further ensure that no medium or residue remains on any contact surface.

Together, the retractable bottom end piece, integral inlet and outlet valves, and cleaning jets enable one person to easily fill, unpack, and clean a column, especially with dense media. Gentle transfer of the media from the slurry tank through the low-shear valves minimizes damage to chromatography beads. Buffer or slurry can be pumped through these valves to maintain agitation, thereby reducing the settling time if necessary.

Variable Height Adaptor With Central Screw Adjustment Mechanism

Bio-Rad GelTec columns have a variable height adaptor with an adjustable central screw mechanism that fits any column diameter, from pilot to manufacturing scale. The adaptor allows either flow or axial compression packing, or both, while the central screw mechanism allows simple yet precise adjustment of the bed height.

The adaptor design makes packing and unpacking manageable, ensuring ease of column use. The central screw design allows a single operator to pack and unpack a column of any diameter. Together, the variable height adaptor and central screw adjustment mechanism offer the flexibility to accommodate any chromatography medium at any bed height with a single column.

Unique Flow Distribution System

The adaptor and bottom end piece of Bio-Rad GelTec columns have a unique flow distribution system that enhances packing and running performance.

The standard frit is stainless steel with a 20 µm porosity for uniform flow and minimal product retention. The distributor plate directs the flow across the frit quickly and evenly. This distributor plate and frit combination ensures optimal, uniform flow distribution across the bed and through the column at low and high flow rates.



Inflatable Seal Design

The seal design of the Bio-Rad GelTec adaptor provides added security against leakage and inefficient packing. The design ensures uniform pressure throughout the seal.

The seals have a minimum wall thickness of 5 mm to prevent leakage and failure. All columns have adaptors through which the seal can be inflated with compressed gas, such as air or nitrogen. If preferred, liquid pumps can be installed so that inert fluids can be used instead of gas.



Customized Columns

In addition to a standard line of columns, Bio-Rad specializes in working with customers to design and manufacture custom columns. Customization may include modification to column dimensions, pressure rating, valves, ports, material, jacketing, etc. Bio-Rad is capable of and willing to partner with customers to provide an affordable and timely solution.

Spare Parts and Accessories

Standard spare parts include frits, O-rings, inflatable seals, and column tube seals. Available accessories include bubble traps, media transfer devices, and packing motors.

Liquid Handling Systems

Bio-Rad offers automated process chromatography systems that are uniquely engineered to meet process and facility design requirements. The computerdriven operation system meets US FDA 21 CFR Part 11 requirements.

Regulatory Support and Quality Assurance

Bio-Rad's manufacturing procedures ensure that each step and every component are fully documented. The qualification documentation package allows production in compliance with US FDA and European regulations. The original documentation and one electronic copy are included with each column. Bio-Rad maintains controlled copies.

Bio-Rad GelTec chromatography columns are manufactured in compliance with engineering standards for pressure vessels, and each column comes with CE certification. The Bio-Rad manufacturing facility is certified according to ISO 9001:2000 standards.

Manufacturing files for each project include:

- Engineering drawings
- Material traceability
- Weld traceability and welder qualifications
- Cleaning, electropolishing, and passivation certificates
- Video boroscope inspection of orbital welds (optional)
- Calibration certificates
- Maintenance procedures and instructions
- Installation and operational qualification (IQ/OQ) protocols
- User manual
- Spare parts list
- Documentation for equipment from other vendors (when applicable)
- Factory acceptance test (FAT)

Packing Motor

Bio-Rad offers optional packing motors (for the top Bio-Rad GelTec adaptor and for the retractable bottom end piece) for all column diameters. A motor is strongly recommended for column diameters ≥450 mm and is required for 800 and 1,000 mm columns. This upgrade allows automatic movement (upward and downward) of the adaptor, which makes packing easier and faster. Both adaptor speed and torque are under variable control. Programming the motor to a defined torque ensures consistent and reproducible column packing.

Specifications*

	Bio-Rad GelTec Column Nominal Internal Diameter (mm)							
	200	300	350	400	450	600	800	1,000
Actual internal diameter, mm	200 ± 1	296 ± 1	350 ± 1	400 ± 1	446 ± 2	595.5 ± 2	800 ± 2	1,000 ± 3
Motorization available	Yes	Yes	Yes	Yes	Yes	Yes	Required	Required
Maximum pressure, bar								
Calibrated borosilicate glass	5.2	3.5	2.6	_	_	1.7	_	_
Stainless steel 316L	6.0	6.0	6.0	6.0	6.0	6.0	3.0	3.0
Acrylic	6.0	6.0	5.5	5.0	4.5	3.0	3.0	3.0
Inflatable seal contents**	Gas	Gas	Gas	Gas	Gas	Gas	Gas	Gas

* Standard tube heights available: 300, 600, and 900 mm.

** As an option, the column can be modified to use inert liquid for inflation.

- Not available.

Related Literature

Bulletin 3130, Bio-Rad[®] EasyPack[™] process chromatography columns product information sheet Bulletin 5488, Process-scale chromatography hardware brochure Bulletin 2686A, Process chromatography folder

Please contact your local Bio-Rad sales representative for ordering information.



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