RF BIOLOGICS
RELENTLESSLY INNOVATIVE

RESINS
CATALOG

WELCOME TO ORF BIOLOGICS

At ORF Biologics, we believe that true innovation in biologics begins with the quality and consistency of the tools that drive discovery and production. Our chromatography resins are engineered to deliver the performance and dependability that modern life science and biopharmaceutical applications demand. Each resin embodies the same principles that define our mission: precision, reproducibility, and scalability, ensuring that researchers and manufacturers can purify with confidence, from the earliest stages of development to full-scale production.

OUR EXPERTISE

With a foundation in protein science and process engineering, the ORF Biologics team has designed a comprehensive suite of chromatography resins optimized for affinity capture, ion exchange, hydrophobic interaction, and size exclusion. Our scientists combine deep technical knowledge with practical experience in upstream and downstream workflows to create resins that perform consistently across platforms and scales. Every product is developed through rigorous R&D, validated under realistic operating conditions, and optimized to meet the evolving needs of bioprocess professionals.

APPLICATIONS ACROSS RESEARCH

From early discovery to GMP manufacturing, ORF Biologics' resins empower scientists to isolate and refine biomolecules with speed, reproducibility, and precision. Our affinity resins streamline antibody and tagged protein capture; our ion-exchange and hydrophobic interaction resins enable efficient polishing and impurity removal; and our size exclusion resins deliver reliable fractionation for high-purity final products. Each resin is formulated for compatibility with standard chromatography systems and validated under a broad range of pH and buffer conditions, supporting the flexibility required in today's diverse purification environments.

SUPPORTING YOUR SCIENCE

We understand that no two purification workflows are identical. That's why ORF Biologics offers flexible packaging, column formats, and prepacked options to accommodate every stage, from analytical scale testing to commercial production. Our team provides hands-on technical guidance for process optimization, column packing, regeneration, and cycle lifetime extension. Whether your goal is to refine a single recombinant protein or scale up an industrial bioprocess, we are dedicated to helping you achieve consistent, high-yield results.

COMMITMENT TO QUALITY

Quality is the foundation of every ORF Biologics resin. Each batch undergoes comprehensive testing to confirm binding capacity, particle uniformity, pH and chemical stability, and pressure tolerance. We ensure that our resins deliver predictable performance across repeated cycles, minimizing process variability and maximizing product integrity. Our documentation and quality control standards are aligned with the expectations of regulated environments, giving you the confidence to integrate our resins into both research and manufacturing workflows.

OUR VISION

At ORF Biologics, we envision a future where bioprocessing is faster, more efficient, and universally accessible. By combining scientific rigor with a deep understanding of real-world challenges, we aim to redefine purification technologies for the next generation of biologics. With ORF Biologics resins, you are investing in innovation that empowers discovery, accelerates production, and strengthens the integrity of every molecule you create. Together, we can advance the science of purification, one resin, one breakthrough at a time.

AFFINITY CHROMATOGRAPHY RESINS

Affinity chromatography resins from ORF Biologics deliver exceptional selectivity and high recovery. These resins leverage precise biological interactions, such as protein-ligand and antibody-antigen binding, to achieve single-step purification with purity levels often exceeding 90%. Affinity chromatography leverages specific biological interactions such as enzyme-substrate, receptor-ligand, and antigen-antibody binding. It offers high selectivity, simple operation, and excellent recovery (>90% purity in a single step). From Protein A capture to GST and His-tag purification, our portfolio provides flexibility and performance across research and manufacturing environments.

Protein A Noverose HL Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.PROTANOVERHL

High-Capacity Affinity Resin for Monoclonal Antibody and Fc-Tag Purification

Protein A Noverose HL Resin is a next-generation affinity chromatography medium engineered for superior performance and durability in large-scale monoclonal antibody (mAb) and Fc tag purification. Featuring an advanced recombinant Protein A ligand coupled to a robust, high-flow agarose base, this resin delivers exceptional binding capacity, alkaline stability, and reusability for cost-effective bioprocessing.

Product Specs

Matrix:	Highly cross-linked agarose	**pH Stability (Operation):**	3–9
Ligand:	Recombinant Protein A derivative	**pH Stability (Cleaning):**	2–12
Particle Size:	50–100 µm	**Cleaning/CIP:**	0.1–0.5 M NaOH
Dynamic Binding Capacity:	≥70 mg hIgG/mL protein/mL	**Storage Solution:**	20% ethanol

Applications

- Capture and purification of monoclonal antibodies (mAbs) and Fc-fusion proteins
- Suitable for clinical and commercial bioprocessing
- Ideal for high-throughput development and automated chromatography

Nickel Hoperose FF Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.NIHOPEROSEFF

High-Performance Affinity Resin for His-Tag Protein Purification

Nickel Hoperose FF Resin utilizes iminodiacetic acid (IDA) or nitrilotriacetic acid (NTA) ligands immobilized on a strong agarose matrix, charged with Ni^{2+} ions for selective purification of His-tag recombinant proteins. It provides high mechanical strength, low nonspecific binding, and robust reusability.

Product Specs

Matrix:	Crosslinked 4% agarose	**pH Stability:**	2–12 (short-term), 3–10 (long-term)
Functional Group:	IDA or NTA (Ni-charged)	**Pressure Tolerance:**	Up to 0.3 MPa
Particle Size:	90–150 µm	**Storage Solution:**	20% ethanol, 4–8°C
Binding Capacity:	≥20 mg His-tag protein/mL		

Applications

- Purification of His-tag recombinant proteins
- Integration into FPLC and continuous purification systems
- Process development and scale-up

HN Nickel Hoperose FF Resin

Size
5 mL Prepacked Column

Catalog Number
ORF.HNNIHOPEROSEFF

Industrial-Grade Chelating Resin for Nickel Recovery and Purification

HN Nickel Hoperose FF is engineered for efficient and selective recovery of nickel ions from process streams. Built on a durable macroporous polymer matrix, it provides exceptional mechanical strength and chemical resistance under harsh industrial conditions.

Product Specs

Matrix:	Macroporous polymer	**Operating pH Range:**	1–14
Functional Group:	Chelating iminodiacetate	**Nickel Capacity:**	≥1.5 eq/L
Ionic Form:	Hydrogen (H^+) form	**Moisture Content:**	45–55%
Particle Size:	300–800 µm		

Applications

- Nickel ion recovery and purification
- Metal scavenging in industrial and chemical processes
- Catalyst recovery and wastewater treatment

Chelating Hoperose FF Resin

Size
5 mL Prepacked Column

Catalog Number
ORF.CHELHOPEROFF

High-Performance Chelating Resin for Metal-Binding Biomolecule Purification

Chelating Hoperose FF is a high-performance chelating chromatography resin engineered for the selective capture and purification of metal-binding biomolecules. Built on a robust, cross-linked agarose matrix, this resin provides excellent mechanical stability, high flow properties, and superior binding capacity for metal ions. Its uniform bead size and optimized ligand density make it ideal for both research and large-scale purification.

Product Specs

Matrix:	6% cross-linked agarose (Fast Flow)	**Flow Rate:**	Up to 300 cm/h
Functional Group:	IDA or NTA	**Recommended Metal Ions:**	Ni^{2+}, Cu^{2+}, Zn^{2+}, Co^{2+}, Fe^{3+}
Operational pH Range:	4–13	**Storage Solution:**	20% ethanol
Cleaning pH Range:	2–14		

Applications

- Purification of His-tag recombinant proteins (IMAC)
- Isolation of metalloproteins, enzymes, and peptides
- Removal of trace metal contaminants
- Metal ion recovery and analytical chelation

Glutathione Hoperose 4FF Resin

Size
5 mL Prepacked Column

Catalog Number
ORF.GLUTHOPER4FF

Affinity Resin for GST-Tag Protein Purification

Glutathione Hoperose 4FF is a high-performance affinity resin optimized for purification of glutathione S-transferase (GST) fusion proteins. Built on a 4% crosslinked agarose matrix, it combines high flow rates, excellent mechanical strength, and low ligand leakage for consistent purification from lab to industrial scale.

Product Specs

Matrix:	4% crosslinked agarose	**pH Stability:**	4–9 (operation), 3–11 (cleaning)
Ligand:	Reduced L-glutathione	**Pressure Tolerance:**	Up to 0.3 MPa
Particle Size:	45–165 µm	**Storage Solution:**	20% ethanol
Binding Capacity:	≥10 mg GST/mL resin		

Applications

- Purification of GST-tagged recombinant proteins
- Capture of glutathione-binding enzymes and peptides
- Biomolecule polishing and process-scale workflows

Plasmid Noverose HR Resin

Size
5 mL Prepacked Column

Catalog Number
ORF.PLASMNOVERHR

High-Resolution Chromatography Resin for Plasmid Purification

Plasmid Noverose HR Resin is a high-resolution chromatographic medium engineered for plasmid DNA purification. It ensures high recovery, purity, and scalability while maintaining structural integrity of supercoiled plasmids, making it ideal for gene therapy and vaccine production.

Product Specs

Matrix:	Crosslinked polymer	**pH Stability:**	3–12
Ligand:	Proprietary anion-exchange ligand	**Pressure Limit:**	Up to 3 bar
Particle Size:	30 µm	**Storage Solution:**	20% ethanol
Dynamic Binding Capacity:	>15 mg pDNA/mL resin		

Applications

- Plasmid DNA purification for gene therapy, mRNA, and vaccines
- Biomanufacturing downstream processing
- Ideal for anion-exchange chromatography systems

ION EXCHANGE CHROMATOGRAPHY RESINS

Our ion exchange chromatography resins enable robust and scalable separation of charged biomolecules. Featuring strong anion (Q), strong cation (SP), and weak anion (DEAE), and weak cation (CM) ion exchangers, these resins are designed for capture, intermediate, and polishing purification steps in biopharmaceutical workflows.

Ion exchange chromatography is a separation technique based on reversible interactions between charged biomolecules in the mobile phase and functional groups on the ion exchange resin (stationary phase). The separation is governed by the strength of ionic interactions, which depends on charge, pH, and salt concentration. Ion exchange resin consists of two key components: Microspheres determines mechanical strength and resolution; Type and density of functional groups affect selectivity and binding capacity of ion exchange resin. Common functional groups: Q: Strong anion exchanger (quaternary amine) DEAE: Weak anion exchanger (diethylaminoethyl) SP: Strong cation exchanger (sulfonate) CM: Weak cation exchanger (carboxymethyl).

Q Hoperose FF Resin

Size
5 mL Prepacked Column

Catalog Number
ORF.QHOPEROSEFF

High-Performance Strong Anion Exchange Chromatography Resin

Q Hoperose FF Resin is a high-flow, strong anion-exchange chromatography medium engineered for robust, scalable biomolecule purification. Featuring a hydrophilic, cross-linked agarose matrix functionalized with quaternary ammonium (Q) groups, it ensures reliable performance across research and industrial workflows.

Product Specs

Matrix:	6% cross-linked agarose	**Dynamic Binding Capacity:**	~42 mg BSA/mL (typical)
Functional Group:	Quaternary ammonium (Q)	**pH Stability:**	2–12 (operation), 2–14 (CIP)
Particle Size:	45–165 µm	**Temperature Range:**	4–40°C
Ionic Capacity:	0.18–0.24 mmol Cl^-/mL resin	**Storage Solution:**	20% ethanol

Applications

- Capture and purification of proteins, nucleic acids, and viral particles
- Intermediate purification of recombinant biologics
- Scalable anion exchange workflows from R&D to GMP production

Q Hoperose HP Resin

Size
5 mL Prepacked Column

Catalog Number
ORF.QHOPEROSEHP

High-Resolution Strong Anion Exchange Resin for Polishing Applications

Q Hoperose HP is a high-resolution, strong anion exchanger optimized for demanding downstream purification. Its fine particle size and hydrophilic, crosslinked agarose matrix provide high resolution, sharp separations, and reproducible scalability.

Product Specs

Matrix:	Crosslinked agarose	**Binding Capacity:**	~70 mg BSA/mL resin
Functional Group:	Quaternary ammonium (Q)	**pH Stability:**	2–12 (operation)
Particle Size:	24–44 µm	**Storage Solution:**	20% ethanol
Ionic Capacity:	0.14–0.20 mmol Cl^-/mL resin		

Applications

- Polishing of recombinant proteins and mAbs
- Nucleic acid purification for gene therapy and vaccine production
- High-resolution separations for charge variants and impurities

SP Hoperose FF Resin

Size
5 mL Prepacked Column

Catalog Number
ORF.SPHOPEROSEFF

Strong Cation Exchange Resin for Protein Capture and Intermediate Purification

SP Hoperose FF Resin is a robust strong cation-exchange chromatography medium designed for protein capture and purification at laboratory and process scales. Built on a hydrophilic 6% agarose matrix and functionalized with sulphopropyl ($-CH_2-CH_2-CH_2-SO_3^-$) groups, it provides excellent flow rates, stability, and scalability.

Product Specs

Matrix:	6% crosslinked agarose	**Dynamic Binding Capacity:**	~70 mg RNase A/mL resin
Functional Group:	Sulphopropyl ($-CH_2-CH_2-CH_2-SO_3^-$)	**pH Stability:**	4–13 (operation), 3–14 (CIP)
		Temperature Range:	4–40°C
Particle Size:	45–165 µm	**Storage Solution:**	20% ethanol in 0.2 M sodium acetate
Ionic Capacity:	0.18–0.25 mmol H^+/mL resin		

Applications

- Capture and purification of positively charged biomolecules (proteins, enzymes, antibodies)
- Intermediate purification in biomanufacturing workflows
- Removal of host-cell proteins, endotoxins, and aggregates

DEAE Hoperose FF Resin

Size
5 mL Prepacked Column

Catalog Number
ORF.DEAEHOPEROFF

Weak Anion Exchange Resin for Biomolecule Purification

DEAE Hoperose FF is a high-performance anion exchange chromatography resin designed for the purification and separation of proteins, nucleic acids, and other charged biomolecules. Built on a rigid, highly crosslinked agarose matrix, it offers excellent flow performance and mechanical strength for both research and industrial-scale bioprocessing.

Product Specs

Functional Group:	Diethylaminoethyl (DEAE)	**pH Stability:**	2–12
Matrix:	6% crosslinked agarose	**Operating pH:**	6–9
Particle Size:	45–165 µm	**Temperature Stability:**	Up to 40°C (short term)
Dynamic Binding Capacity:	High (protein dependent)	**Storage Solution:**	20% ethanol

Applications

- Purification of enzymes, antibodies, and plasma proteins
- Removal of nucleic acids, endotoxins, and anionic impurities
- Polishing steps in downstream bioprocessing workflows
- Scalable from lab to industrial chromatography systems

CM Hoperose FF Resin

Size
5 mL Prepacked Column

Catalog Number
ORF.CMHOPEROSEFF

Weak Cation Exchange Resin for Protein Capture and Purification

CM Hoperose FF is a high-flow weak cation exchange (CEX) resin optimized for the capture and purification of proteins, antibodies, and other biomolecules. Featuring a carboxymethyl ($-CH_2-COO^-$) ligand attached to a rigid crosslinked agarose base, it delivers superior binding capacity, flow performance, and chemical stability from R&D to manufacturing scales.

Product Specs

Functional Group:	Carboxymethyl ($-CH_2-COO^-$)	**pH Stability:**	4–13 (operation), 2–14 (cleaning)
Matrix:	Crosslinked agarose (6%)	**Temperature Range:**	4–40°C
Particle Size:	45–165 µm	**Storage Solution:**	20% ethanol
Ionic Capacity:	0.09–0.13 mmol/mL		

Applications

- Capture and intermediate purification of recombinant proteins
- Polishing and impurity removal steps in biologics workflows
- Separation of protein isoforms based on charge properties

HYDROPHOBIC INTERACTION CHROMATOGRAPHY (HIC) RESINS

Hydrophobic Interaction Chromatography resins separate biomolecules based on surface hydrophobicity, enabling efficient removal of aggregates, lipids, and impurities. ORF Biologics' Butyl, Octyl, and Phenyl Hoperose resins provide versatile options for proteins with varying hydrophobic properties. Hydrophobic chromatography is a widely used technique for separating and purifying biomolecules based on differences in surface hydrophobicity. The key to selecting an appropriate hydrophobic chromatography resin lies in choosing the suitable hydrophobic functional groups. For weakly hydrophobic proteins, resins with stronger hydrophobicity are preferred, while less hydrophobic functional groups are suitable for strongly hydrophobic proteins. To enhance the interaction between the protein and the hydrophobic functional groups, salts, most commonly ammonium sulfate due to its high solubility, are typically added to the buffer to promote binding. Hydrophobic chromatography resin offers high resolution and large binding capacity, and has become one of the most commonly used techniques for the purification of biochemical products, proteins, peptides, and other biomolecules. Hydrophobic chromatography resins consist of a microsphere and functional groups; the microsphere provides mechanical strength and determines resolution, while the type and density of the hydrophobic groups influence the selectivity and binding capacity of the resin.

Butyl Hoperose HP Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.BUTYLHOPERHP

High-Performance Hydrophobic Interaction Chromatography Resin

Butyl Hoperose HP Resin is a high-performance hydrophobic interaction chromatography (HIC) medium designed for the purification of proteins, antibodies, and hydrophobic biomolecules. Featuring a butyl ligand on a crosslinked polymeric Hoperose matrix, it offers high mechanical strength, reproducibility, and stability under rigorous conditions.

Product Specs

Matrix:	Crosslinked polymeric Hoperose	**pH Stability:**	3–13 (operation), 2–14 (CIP)
Functional Group:	Butyl (C_4H_9–)	**Chemical Stability:**	1 M NaOH, mild organic solvents
Particle Size:	45–165 µm		
Average Pore Size:	~100 nm	**Autoclaving Stability:**	1 M NaOH, mild organic solvents
Dynamic Binding Capacity:	≥35 mg BSA/mL resin	**Storage Solution:**	1 M NaOH, mild organic solvents
Pressure Tolerance:	≤3 bar	**Storage Temperature:**	2–8°C

Applications

- Capture and polishing of antibodies, enzymes, and recombinant proteins
- Removal of aggregates and hydrophobic impurities
- Polishing steps in biomanufacturing workflows

Octyl Hoperose 4FF Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.OCTYLHOPE4FF

High-Performance Hydrophobic Interaction Resin for Biomolecule Purification

Octyl Hoperose 4FF Resin is a high-performance hydrophobic interaction chromatography (HIC) medium designed for the purification of proteins and biomolecules based on surface hydrophobicity. Built on a 4% crosslinked agarose matrix and functionalized with octyl (C_8) groups, it provides high mechanical stability, excellent flow characteristics, and reproducible separations from lab to industrial scale.

Product Specs

Matrix:	4% crosslinked agarose	**Chemical Stability:**	Stable in 1 M NaOH, 6 M urea, 30% ethanol
Functional Group:	Octyl (C_8–)		
Particle Size:	45–165 µm	**Pressure Limit:**	≤3 bar
Average Pore Size:	~100 nm	**Autoclaving Stability:**	121°C for 20 minutes
Dynamic Binding Capacity:	≥35 mg BSA/mL resin	**Storage Solution:**	20% ethanol
		Storage Temperature:	2–8°C
pH Stability:	3–13 (operation), 2–14 (CIP)		

Applications

- Purification of antibodies, enzymes, and hydrophobic recombinant proteins
- Separation of protein isoforms and aggregates
- Polishing and intermediate steps in downstream bioprocessing

Phenyl Hoperose HP Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.PHENYLHOPEHP

High-Resolution Hydrophobic Interaction Chromatography Resin Purification

Phenyl Hoperose HP Resin is a high-resolution hydrophobic interaction chromatography resin designed for fine purification of hydrophobic proteins, antibodies, and enzymes. Built on a crosslinked agarose matrix with phenyl (C_6H_5–) functional groups, it ensures precise separations, high recovery, and reproducibility under variable salt conditions.

Product Specs

Matrix:	Crosslinked agarose	**Chemical Stability:**	Stable in 1 M NaOH, 6 M urea, 30% ethanol
Functional Group:	Phenyl (C_6H_5–)		
Particle Size:	24–44 µm	**Autoclaving Stability:**	121°C for 20 minutes
Binding Capacity:	≥30 mg BSA/mL resin	**Storage Solution:**	20% ethanol
Pressure Limit:	≤3 bar	**Storage Temperature:**	2–8°C
pH Stability:	3–13 (operation), 2–14 (CIP)		

Applications

- Polishing of antibodies, enzymes, and fusion proteins
- Removal of aggregates and host-cell impurities
- Fine separations requiring moderate hydrophobic selectivity

Phenyl Hoperose FF (HS) Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.PHENHOPEFFHS

High-Strength Hydrophobic Interaction Chromatography Resin for Large-Scale Processing

Phenyl Hoperose FF (HS) Resin is a strong, fast flow, hydrophobic interaction chromatography medium developed for large-scale purification under industrial conditions. With high ligand density and a 6% crosslinked agarose matrix, it provides superior mechanical strength, flow stability, and reproducibility under high-pressure operation.

Product Specs

Matrix:	6% crosslinked agarose (fast flow grade)	**Pressure Limit:**	≤3 bar
Functional Group:	Phenyl (C_6H_5–)	**pH Stability:**	3–13 (operation), 2–14 (CIP)
Particle Size:	45–165 µm	**Chemical Stability:**	1 M NaOH, 6 M urea, 20% ethanol
Ligand Density:	High (strong HIC interaction)	**Autoclaving Stability:**	121°C for 20 minutes
Dynamic Binding Capacity:	≥40 mg BSA/mL resin	**Storage Solution:**	20% ethanol
		Storage Temperature:	2–8°C

Applications

- Industrial purification of hydrophobic proteins and antibodies
- Capture and polishing of recombinant biologics
- Process-scale hydrophobic separations

Phenyl Hoperose FF (LS) Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.PHENHOPEFFLS

Low-Substitution Hydrophobic Interaction Chromatography Resin for Mild Protein Purification

Phenyl Hoperose FF (LS) is a fast flow, hydrophobic interaction chromatography (HIC) resin engineered for the purification and polishing of proteins, peptides, and other biomolecules under mild, non-denaturing conditions. Built on a 6% crosslinked agarose matrix functionalized with low-substitution phenyl ligands, it offers balanced hydrophobicity for selective separations, excellent product recovery, and superior reproducibility. The Fast Flow (FF) matrix ensures mechanical stability and scalability across laboratory and industrial bioprocessing.

Product Specs

Matrix:	6% crosslinked agarose (Fast Flow grade)	Pressure Limit:	≤3 bar
Functional Group:	Phenyl (Low Substitution, LS)	pH Stability:	3–13 (operation), 2–14 (CIP)
Particle Size:	45–165 µm (avg. 90 µm)	Chemical Stability:	1 M NaOH, 6 M urea, 20% ethanol
Ligand Density:	High (strong HIC interaction)	Autoclaving Stability:	121°C for 20 minutes
Dynamic Binding Capacity:	≥40 mg BSA/mL resin	Storage Solution:	20% ethanol
		Storage Temperature:	2–8°C

Applications

- Industrial purification of hydrophobic proteins and antibodies
- Capture and polishing of recombinant biologics
- Process-scale hydrophobic separations

MULTI-MODE CHROMATOGRAPHY RESINS

Multi-mode resins combine ionic, hydrophobic, and hydrogen-bonding interactions for enhanced selectivity. They are ideal for aggregate removal, host-cell protein reduction, and complex purification challenges. Multi-mode ion exchange resins are functionalized with a combination of hydrophobic, ionic, and hydrogen bonding groups. Compared to conventional ion chromatography resins, they offer multimodal selectivity for more nuanced separation strategies based on both hydrophobicity and charge. ORF Biologics' Shell Technology Multi-mode Chromatography Resin HN Shell 400 & HN Shell 700 utilize core-shell technology and multi-mode ligands that integrate size exclusion, hydrophobic interaction, and ion exchange into a single medium.

HN Shell 400 Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.HNSHELL400

Multi-Model Core–Shell Chromatography Medium

HN Shell 400 is engineered using core–shell technology combined with multi-modal ligand functionality, integrating size exclusion, hydrophobic interaction, and ion exchange within a single medium. Designed for the purification of very large biomolecules (>400 kDa), the rigid particle architecture supports high flow rates and excellent resolution.

Product Specs

Matrix:	Highly crosslinked agarose core with functionalized polymeric shell
Ligand:	Multi-modal (hydrophobic + ionic functional groups)
Particle Size:	80–120 µm
Mode of Action:	Size exclusion–dominant with HIC/IEX contributions
Dynamic Binding Capacity:	Not applicable (size-exclusion resin)
pH Stability (Operation):	3–12
pH Stability (Cleaning):	2–13 (short-term)
Chemical Stability:	Compatible with NaOH ≤0.5 M, salts, mild detergents, 20% ethanol
Cleaning/CIP:	0.1–0.5 M NaOH or 20% ethanol
Storage Solution:	20% ethanol
Operating Pressure:	<0.5 MPa
Flow Rate:	<600 cm/h
Application:	Purification of biomolecules >400 kDa
SBC:	2000 L
APC:	200,000 L

Applications

- Separation and purification of biomolecules larger than 400 kDa
- Suitable for viral particles, large protein complexes, polysaccharide conjugates
- Ideal for polishing steps requiring controlled size-exclusion behavior with multi-modal selectivity
- Supports preparative and process-scale workflows

HN Shell 700 Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.HNSHELL700

Multi-Mode Core–Shell Chromatography Medium

HN Shell 700 utilizes the same advanced core–shell, multi-modal architecture as HN Shell 400 but is optimized for biomolecules larger than 700 kDa. The rigid outer shell integrates multiple interaction modes, delivering robust performance for extremely large biomolecule purification.

Product Specs

Matrix:	Highly crosslinked agarose core with functionalized polymeric shell
Ligand:	Multi-modal (hydrophobic + ionic functional groups)
Particle Size:	80–120 µm
Mode of Action:	Size exclusion–dominant with secondary HIC/IEX effects
Dynamic Binding Capacity:	Not applicable (size-exclusion resin)
pH Stability (Operation):	3–12
pH Stability (Cleaning):	2–13 (short-term)
Chemical Stability:	Compatible with NaOH ≤0.5 M, salts, mild detergents, 20% ethanol
Cleaning/CIP:	0.1–0.5 M NaOH or 20% ethanol
Storage Solution:	20% ethanol
Operating Pressure:	<0.5 MPa
Flow Rate:	<600 cm/h
Application:	Purification of biomolecules >700 kDa
SBC:	2000 L
APC:	200,000 L

Applications

- Purification of extremely large biomolecules >700 kDa
- Excellent for viral vectors, mega-dalton complexes, and high–molecular-weight polymers
- Suitable for large-scale bioprocessing where high flow and low backpressure are required
- Ideal for workflows needing combined SEC + HIC/IEX behavior

RIGID AGAROSE PACKING RESINS

Rigid Packing Resins from ORF Biologics are engineered for high-performance purification of large and complex biomolecules, combining highly crosslinked agarose or polymeric matrices with exceptional mechanical rigidity to support high flow rates, low backpressure, and consistent scalability from lab columns to industrial systems. These robust materials resist compression and channeling under demanding process conditions, enabling efficient separation of high–molecular-weight targets such as viral particles, nucleoprotein complexes, plasmid conjugates, and polysaccharides. Core–shell variants further enhance selectivity through multimodal surface chemistries that integrate size exclusion, hydrophobic interactions, and ion-exchange behavior, delivering orthogonal separation in a single medium. Compatible with broad pH ranges and standard cleaning agents, Rigid Packing Resins maintain stability across repeated cycles, making them ideal for bioprocess workflows in gene therapy, vaccine production, and purification of large protein assemblies where traditional soft-gel media cannot maintain structural integrity.

Hoperose 4FF Size Exclusion Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.HOPEROSE4FF

Fast-Flow Agarose Matrix for High-Throughput Biomolecule Purification

Hoperose 4FF is a high-performance, fast-flow chromatography size exclusion resin engineered for efficient processing of large biomolecules including proteins, viral particles, and macromolecular complexes. Built on a highly crosslinked 4% agarose matrix, it offers excellent mechanical rigidity, high flow capacity, and superior scalability across laboratory and manufacturing environments.

Product Specs

Matrix:	4% crosslinked agarose
Particle Size:	45–165 µm
Average Particle Size:	~90 µm
Pressure Tolerance:	Up to 0.3 MPa
pH Stability:	2–12
Autoclaving Stability:	121°C for 20 minutes
Storage Solution:	20% ethanol
Storage Temperature:	2–30°C

Applications

- Capture or polishing in downstream bioprocessing
- Size exclusion or gel filtration chromatography
- Matrix base for affinity, ion-exchange, or hydrophobic resins
- Industrial-scale purification under cGMP conditions

Hoperose 6FF Size Exclusion Resin

Size	Catalog Number
5 mL Prepacked Column	ORF.HOPEROSE6FF

High-Strength Agarose Matrix for Biomolecule Separation and Capture

Hoperose 6FF is a high-performance, fast-flow chromatography size exclusion resin built on a 6% crosslinked agarose base. Combining mechanical rigidity, high flow performance, and chemical stability, it provides a robust platform for protein purification, antibody capture, and process-scale downstream applications.

Product Specs

Matrix:	6% crosslinked agarose
Particle Size:	45–165 µm (Dv50 ~90 µm)
Porosity:	Suitable up to ~1,000 kDa
Pressure Limit:	0.3 MPa (3 bar)
Flow Rate:	≥600 cm/h at 1 bar (water)
pH Stability:	3–13 (operation), 2–14 (CIP)
Chemical Stability:	Stable in 1 M NaOH, 20% ethanol, 30% isopropanol
Autoclaving Stability:	121°C for 20 minutes
Storage Solution:	20% ethanol
Storage Temperature:	2–8°C

Applications

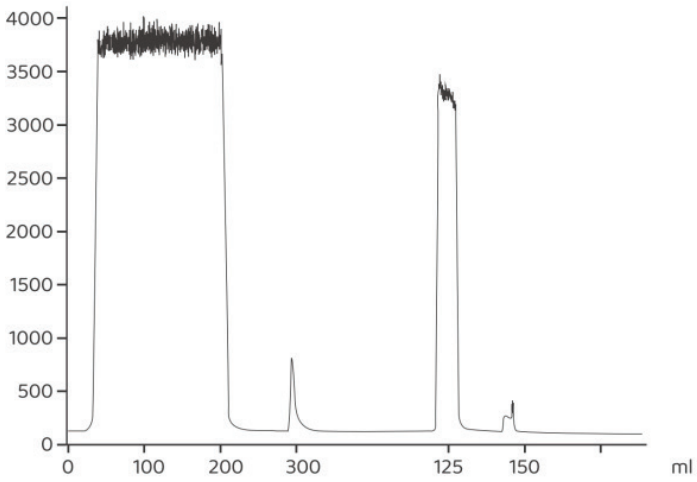
- Protein and enzyme purification
- Monoclonal antibody capture and polishing
- Hydrophobic, ion-exchange, or affinity chromatography base
- GMP downstream processing

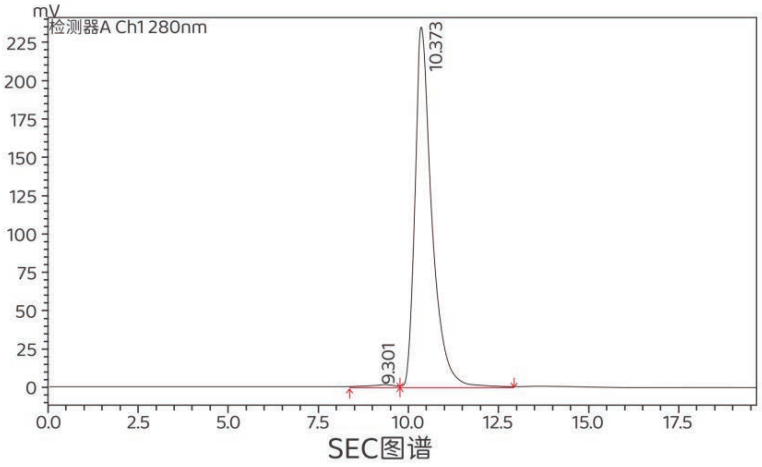
RESIN APPLICATIONS AND DATA

IgG Bispecific Antibody Purification Case

STEP 1: Capture using Protein A Noverose HL

Sample: 1227-1 fermentation broth (conc: 6 mg/mL; Extinction coefficient (ε) = 1.53)
Resin: Protein A Noverose HL, 16.4 mL
RT: 6min
Equilibration: 20 mM Tris-HCl +150 mM NaCl
Elution: 50 mM HAc-NaAc, pH 3.6

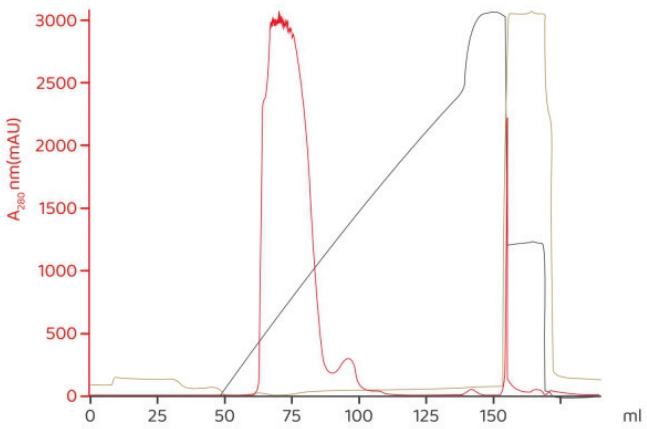




Quality Parameter	Index Result
Yield(%)	102%
SEC(%)	99.24
HCP(ppm)	828
Pro A(ppm)	6

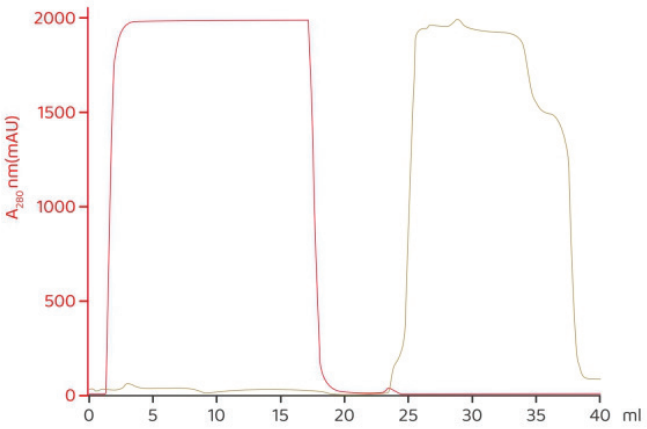
STEP 2: Intermediate purification using SP Noverose HF

Sample: Eluate from Step 1, adjusted to pH 5 and diluted 2×
Resin: SP Noverose HF, 5 mL
RT: 4min
Equilibration: 25 mM sodium acetate, pH 5
Elution: 25 mM sodium acetate + 500 mM NaCl, pH 5



STEP 3: Q Noverose HF Ion Exchange Purification of Bispecific Antibodies

Sample: Elution from SP Noverose HF medium and buffer exchange
Resin: Q Noverose HF,1mL
R T: 2min
Equilibration: 25 mM sodium phosphate, pH 7.5



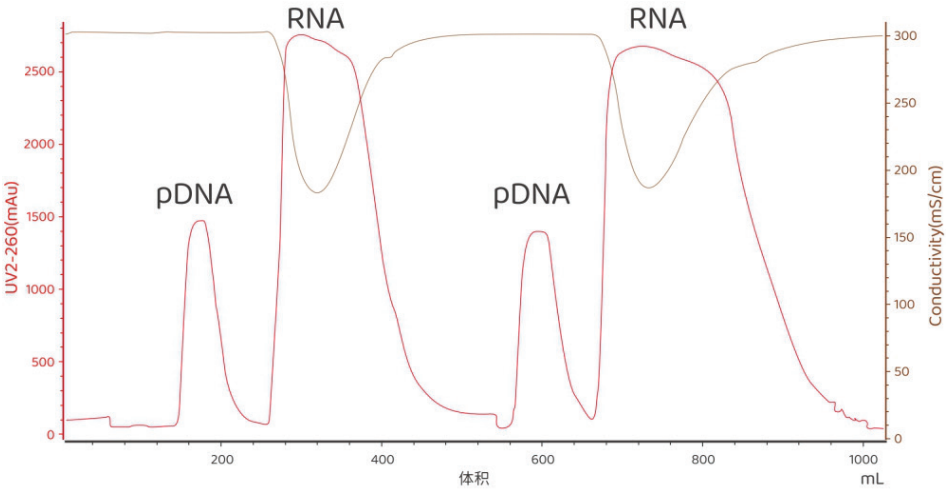
Overall Recovery: 91%

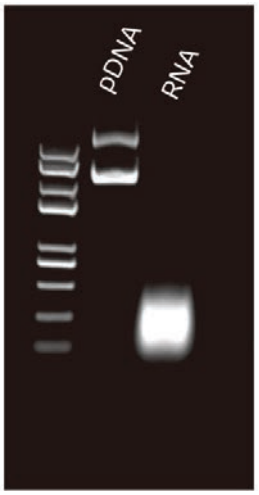
Process Step	Yield	Aggregates	HCP(ppm)	Leached ligand(ppm)
Protein A Noverose HL	102%	1.3%	828	6
SP Noverose HF	93.1%	0.76%	18	<1
Q Noverose HF	95.8%	0.8%	6	<1

Plasmid Vaccine Purification Case

Step 1: RNA removal using Hoperose 6FF

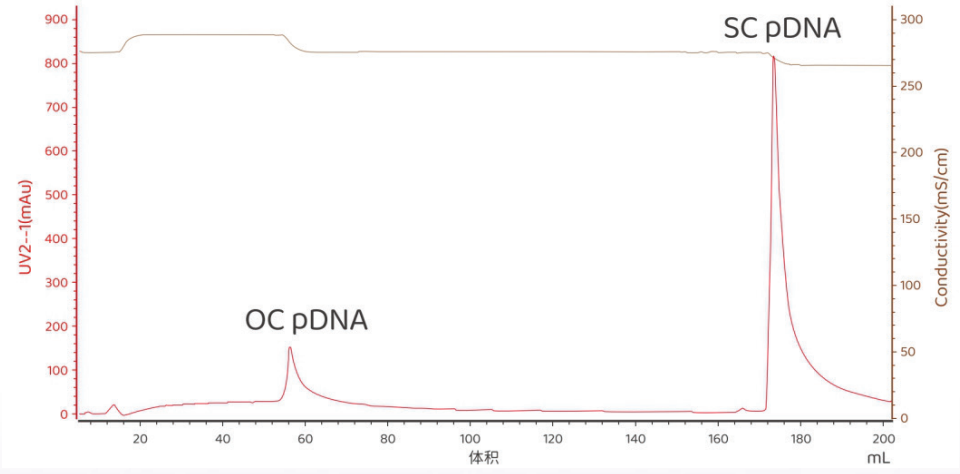
Sample: E. coli lysate
Resin: Hoperose 6FF, 240 mL
Equilibration: 2.1 M $(NH_4)_2SO_4$, 10 mM EDTA, 100 mM Tris-HCl, pH 7.5





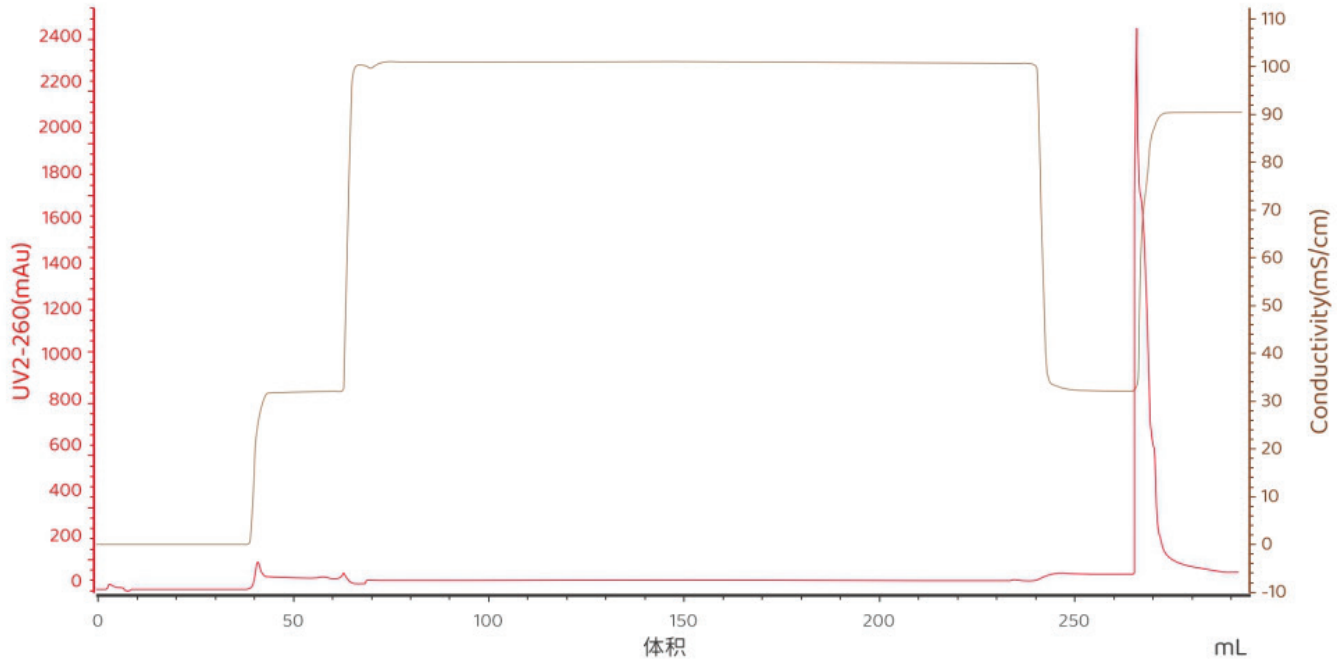
Step 2: OC pDNA removal using Plasmid Noverose HR

Resin: Plasmid Noverose HR,5mL
Equilibration: 2 M $(NH_4)_2SO_4$, 10 mM EDTA, 100 mM Tris-HCl,pH 7.5
Elution: 1.7 M $(NH_4)_2SO_4$, 300 mM NaCl, 10 mM EDTA, 100 mM Tris-HCl, pH 7.5



Step 3: Endotoxin removal using Q Noverose HR

Resin: Q Noverose HR ,5mL
Equilibration: 100 mM Tris-HCl, 10 mM EDTA, 300 mM NaCl, pH 7.5
Elution: 100 mM Tris-HCl, 10 mM EDTA, 1 M NaCl, pH 7.5



Overall Recovery: 71.2%

Process Step	Yield	SC pDNA Ratio
Hoperose 6FF	95%	71%
Plasmid Noverose HR	78.2%	96.1%
Q Noverose HR	95.9%	96.8%

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1110 Tall Grass Ave.
Tiffin, Iowa 52340, USA

orfbiologics.com
contact@orfbiologics.com