# PROTEIN PURIFICATION
## PRODUCT MANUAL


Innovative / Reproducible
Rugged

Welch Materials, Inc.

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# COMPANY PROFILE

Welch Materials is a multinational company that develops and manufactures chromatography consumables including HPLC column, Solid Phase Extraction (SPE) column, GC column Prep column, Flash column and packing materials.

Welch Materials (Shanghai), Inc. was established in 2003 at Shanghai,  China and Welch Materials (Zhejiang) was set in 2011 at Jinhua, Zhejiang, China. We also have set Welch Materials, Inc. at Hurst and Welch Materials India Pvt, Ltd. at Gurgaon. Our initial strength was our extensive experience on particle surface modification science and techniques. We  are experts on bonding chemistry and innovative packing materials for chromatography applications. Through the optimal utilization of our resources, we have  developed many innovative LC and GC consumable  products, in particular, our five  series HPLC columns, UltisilTM, Welchrom®, Xtimate®, Topsil® and BoltimateTM.

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# GEL FILTRATION CHROMATOGRAPHY MEDIA

## Introduction

Gel filtration chromatography is also called exclusion chromatography or molecular sieve method, which is mainly based on the size and shape of the protein, that is, the weight of the protein for separation and purification. The packing materials in the chromatography column are some inert porous network structure substances, mostly cross-linked glycans (such as dextran or agarose) so that protein mixtures could be separated according to different molecular sizes. Generally, large molecules flow out first and small molecules flow out later. Therefore, the key to selecting gel filtration media is to choose a suitable separation range, and then mechanical properties and scalability of the media can be taken into account.

## Advantages

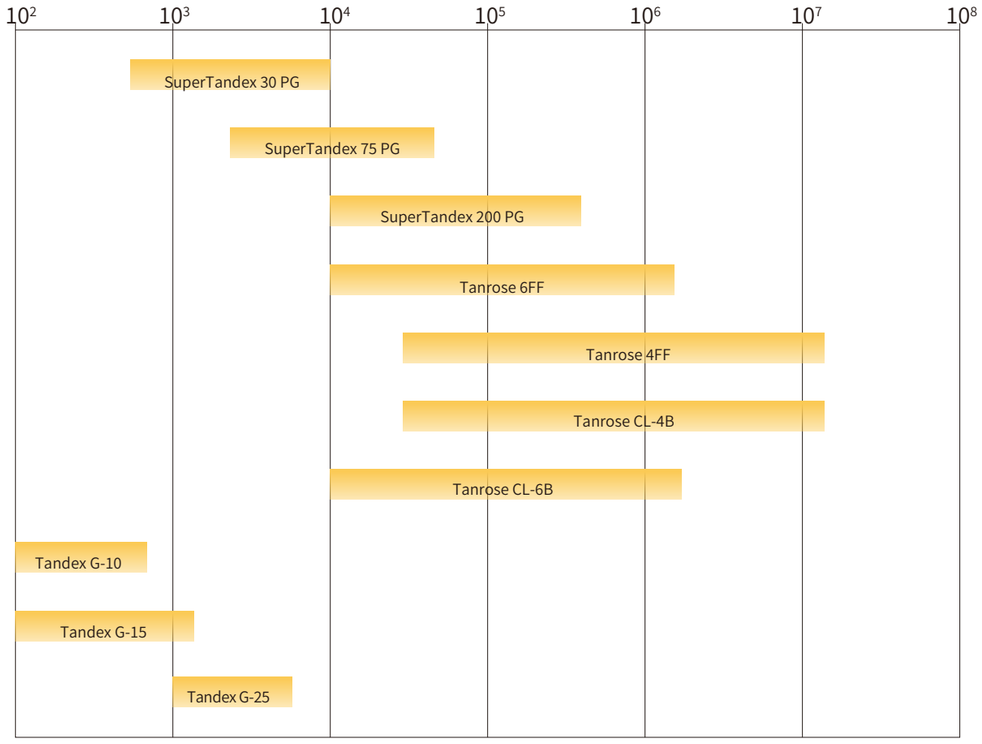
* No charge, weak adsorption, mild operating conditions
* Can work in a wide temperature range
* No need of organic solvents

## Selection of Gel Filtration Chromatography Columns

For group separation, gel filtration chromatography columns with a length of 2-30 cm are generally used.

For gradient separation, columns with a length of around 100 cm and a diameter in the range of 1-5 cm are usually required. A diameter smaller than 1 cm produces wall effects, while a diameter larger than 5 cm results in significant dilution. The length-to-diameter ratio (L/D) is generally recommended to be between 7-10, but for substances with slow mobility, it should be between 30-40.

## Gel filtration separating list (Da, protein globules)








# TANDEX G SERIES AND LH-20 MULTI-MODE GEL FILTRATION SERIES

Tandex G series gel filtration media use dextran as raw material and chloropropylene oxide as cross-linked agent. Dextran gel is a bead-like gel containing a large number of hydroxyl groups, so it swells easily in water and electrolyte solutions. G-type dextran gels have varying degrees of cross-linking, so their swelling degree and fractionation range also differ. The swelling degree of glucan gel is basically unaffected by the presence of salts and detergents.

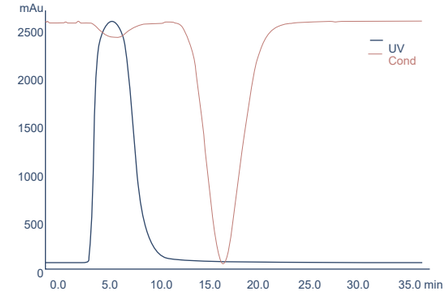
Tandex LH-20 is a product obtained by hydroxypropylation on the basis of Tandex G-25. It can be used in water, in polar organic solvents and in their mixture. It is suitable for the separation of effective ingredients of traditional Chinese medicine and the fine purification of antibiotics and chemical drugs. If reverse phase solvents are used for elution, dextran gel LH-20 also plays a role in reversed-phase distribution of compounds. Hence, the compounds with large polarity and weak retention are eluted first, whereas compounds with small polarity and strong retention are eluted later. If elute with normal phase solvents, gel filtration is the main separation mode.

## Technical parameters

| | pH stability (working) | CIP stability (short term) | Dry powder particle(μm) | Separation range dextran (Mr) | Separation range size globulin (Mr) | Maximum flow rate(cm/h) | Maximum pressure(bar) |
|---|---|---|---|---|---|---|---|
| Tandex G10 | 2-13 | 2-13 | 40-120 | ＜700 | ＜700 | D | D |
| Tandex G15 | 2-13 | 2-13 | 40-120 | ＜1500 | ＜1500 | D | D |
| Tandex G25 C | 2-13 | 2-13 | 100-300 | 100-5000 | 1000-5000 | D | D |
| Tandex G25 M | 2-13 | 2-13 | 50-150 | 100-5000 | 1000-5000 | 150 | D |
| Tandex G25 F | 2-13 | 2-13 | 20-80 | 100-5000 | 1000-5000 | 60 | D |
| Tandex G25 SF | 2-13 | 2-13 | 20-50 | 100-5000 | 1000-5000 | 20 | D |
| Tandex LH-20 | 2-13 | 2-13 | 30-120 | - | ＜5000 | 700 | D |
| Path note: D indicates that the characteristics of the ball follow Darcy's law | | | | | | | |

## Application

Column: PreCot 5 ml G-25, two in series
Medium type: PreCot G-25 medium
Buffer: 0.2 M $NaHCO_3$, 0.5 M NaCl, pH = 8.3
Injection volume: 1.9 ml
Elution peak volume: 3 ml
Determination of eluted protein concentration: 4.9 mg/ml
Recovery rate of changed buffer: 98%



## Ordering information

| Product | P/N | Specification | Product | P/N | Specification | Product | P/N | Specification |
|---|---|---|---|---|---|---|---|---|
| Tandex G10 | 00051-10001 | 25g | Tandex G15 | 00051-20001 | 25g | Tandex G25 C | 00051-31001 | 25g |
| | 00051-10002 | 100g | | 00051-20002 | 100g | | 00051-31002 | 100g |
| | 00051-10003 | 500g | | 00051-20003 | 500g | | 00051-31003 | 500g |
| | 00051-10004 | 1000g | | 00051-20004 | 1000g | | 00051-31004 | 1000g |
| Tandex G25 M | 00051-32001 | 25g | Tandex G25 F | 00051-33001 | 25g | Tandex G25 SF | 00051-34001 | 25g |
| | 00051-32002 | 100g | | 00051-33002 | 100g | | 00051-34002 | 100g |
| | 00051-32003 | 500g | | 00051-33003 | 500g | | 00051-34003 | 500g |
| | 00051-32004 | 1000g | | 00051-33004 | 1000g | | 00051-34004 | 1000g |
| Tandex LH-20 | 00051-00001 | 25g |  | | |  | | |
| | 00051-00002 | 100g | | | | | | |
| | 00051-00003 | 500g | | | | | | |
| | 00051-00004 | 1000g | | | | | | |

# SUPERTANDEX PREP GRADE SERIES

SuperTandex series gel filtration medium is based on highly cross-linked agarose and filled with dextran. It has both high selectivity of dextran and physical property of agarose so that SuperTandex Prep Grade can obtain high resolution even at high flow rate, making it a good choice for fine purification stage.

## Technical parameters

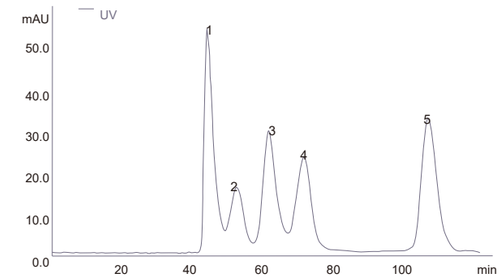
| Name | SuperTandex 30pg | SuperTandex 75pg | SuperTandex 200pg |
|---|---|---|---|
| Property | Gel filtration media (highly cross-linked media) | Gel filtration media (highly cross-linked media) | Gel filtration media (highly cross-linked media) |
| Bead structure | Agarose and dextran | Agarose and dextran | Agarose and dextran |
| Mean particle size (dry) | 34 μm (24-44μm) | 34 μm (24-44μm) | 34 μm (25-45 μm) |
| Exclusion range (linear molecule, Mr) | 400-7,000 | 500-30,000 | 1,000-100,000 |
| Exclusion range (globulin, Mr) | <10,000 | 3,000-70,000 | 10,000-600,000 |
| Flow Rate | 30-50cm/h (TXK26/70, h-60cm) | 30-50cm/h (TXK26/70, h-60cm) | 30-50cm/h (TXK26/70, h-60cm) |
| Sterilization | In water at 121℃ for 20 min | In water at 121℃ for 20 min | In water at 121℃ for 20 min |
| pH stability | 2-12 (long term), 2-14 (short term) | 2-12 (long term), 2-14 (short term) | 2-12 (long term), 2-14 (short term) |
| Chemical stability | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN,1% SDS, 6 M guanidine hydrochlorid, 8 M urea | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN,1% SDS, 6 M guanidine hydrochlorid, 8 M urea | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN,1% SDS, 6 M guanidine hydrochlorid, 8 M urea |
| Storage solvent and temperature | 20% ethanol, 4-30℃ | 20% ethanol, 4-30℃ | 20% ethanol, 4-30℃ |





## Application

Name: PreLoad 16/60 SuperTandex 75pg
Flow rate: 1 ml/min
Sample volume: 1 ml
Buffer: 0.15 M NaCl, 20mM PB, pH 7.0
Sample: 1. IgG (Mr160 000), 2.5 mg/ml
2. Ovalbumin (Mr43 000), 2.5 mg/ml
3. Chymotrypsinogen A (25 000), 1.5 mg/ml
4. RNase A (Mr13 700), 5.0 mg/ml
5. Vitamin B12 (Mr1 355), 0.3 mg/ml




## Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| SuperTandex 30 pg | 00055-10001 | 25 ml | |
| | 00055-10002 | 150 ml | |
| | 00055-10003 | 750 ml | |
| | 00055-10004 | 1 L |  |
| SuperTandex 75 pg | 00055-20001 | 25 ml | |
| | 00055-20002 | 150 ml | |
| | 00055-20003 | 750 ml | |
| | 00055-20004 | 1 L | |
| SuperTandex 200 pg | 00055-30001 | 25 ml | |
| | 00055-30002 | 150ml | |
| | 00055-30003 | 750 ml | |
| | 00055-30004 | 1 L | |

# TANROSE FAST FLOW SERIES

Tanrose 4FF and Tanrose 6FF are gel filtration media formed by emulsifying, rinsing and sieving from 4% and 6% agarose, respectively. The medium has good physical and chemical stability and can be sterilized by sodium hydroxide or high-pressure steam, suitable for separation and purification of polysaccharides, nucleic acids, viruses, superhelix DNA and macromolecular complexes.

Tanrose 4B and Tanrose 6B's structures are only fixed by hydrogen bond, so they are relatively soft and can't resist high temperature and high pressure.

## Technical parameters

| Name | Tanrose 4FF | Tanrose 6FF |
|---|---|---|
| Property | Gel filtration media (highly cross-linked media) | Gel filtration media (highly cross-linked media) |
| Bead structure | 4% agarose | 6% agarose |
| Mean particle size (dry) | 90 μm (45-165 μm) | 90 μm (45-165 μm) |
| Exclusion range (linear molecule, Mr) | 30,000-5,000,000 | 10,000-1,000,000 |
| Exclusion range(globulin, Mr) | 60,000-20,000,000 | 10,000-4,000,000 |
| Sterilization | In water at 121℃ for 20 min | In water at 121℃ for 20 min |
| pH stability | 2-12 (long term), 2-14 (short term) | 2-12 (long term), 2-14 (short term) |
| Flow rate | 150-250 cm/h (Column height 10cm, diameter 5cm, 0.1 MPa, 25℃) | 200-400 cm/h (Column height 10cm, diameter 5cm, 0.1 MPa, 25℃) |
| Chemical stability | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS,6 M guanidine hydrochlorid, 8 M urea | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS,6 M guanidine hydrochlorid, 8 M urea |
| Storage solvent and temperature | 20% ethanol, 4-30℃ | 20% ethanol, 4-30℃ |

## Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Tanrose 4FF | 00052-20001 | 25 ml |  |
| | 00052-20002 | 100 ml | |
| | 00052-20003 | 500 ml | |
| | 00052-20004 | 1 L | |
| Tanrose 6FF | 00052-20005 | 25 ml | |
| | 00052-20006 | 100 ml | |
| | 00052-20007 | 500 ml | |
| | 00052-20008 | 1 L | |





# TANROSE/TANROSE CL SERIES

Tanrose CL-4B and Tanrose CL-6B are further cross-linked by Tanrose 4B and Tanrose 6B with better physical and chemical stability and stronger rigidity. They offer the same selectivity with Tanrose 4B/6B, but have faster flow rate. The Tanrose CL series is resistant to organic solvents, thus it is suitable for the separation containing organic solvents.

Tanrose 4B / 6B and Tanrose CL-4B / CL-6B have larger pore size so that they are suitable for separation of large molecular weight.

## Technical parameters

| Name | Tanrose 4FF | Tanrose 6B | Tanrose CL-4B | Tanrose CL-6B |
|---|---|---|---|---|
| Property | Gel filtration media (soft media fixed by hydrogen bond) | Gel filtration media (soft media fixed by hydrogen bond) | Gel filtration media (soft media fixed by hydrogen bond) | Gel filtration media (soft media fixed by hydrogen bond) |
| Bead structure | 4% agarose | 6% agarose | 4% agarose | 6% agarose |
| Mean particle size (dry) | 90 μm (45-165 μm) | 90 μm (45-165 μm) | 90 μm (45-165 μm) | 90 μm (45-165 μm) |
| Exclusion range (linear molecule, Mr) | 30,000-5,000,000 | 10,000-1,000,000 | 30,000-5,000,000 | 10,000-1,000,000 |
| Exclusion range (globulin, Mr) | 60,000-20,000,000 | 10,000-4,000,000 | 60,000-20,000 000 | 10,000-4,000,000 |
| Sterilization | In water at 121℃ for 20 min | In water at 121℃ for 20 min | In water at 121℃ for 20 min | In water at 121℃ for 20 min |
| pH stability | 2-12 (long term), 2-14 (short term) | 2-12 (long term), 2-14 (short term) | 2-12 (long term), 2-14 (short term) | 2-12 (long term), 2-14 (short term) |
| Flow rate | 70-140 cm/h (Column height 10cm, diameter 5cm, 0.1 MPa, 25℃) | 100-200 cm/h (Column height 10cm, diameter 5cm, 0.1 MPa, 25℃) | 80-150 cm/h (Column height 10cm, diameter 5cm, 0.1 MPa, 25℃) | 100-200 cm/h (Column height 10cm, diameter 5cm, 0.1 MPa, 25℃) |
| Chemical stability | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 8 M urea, 6 M guanidine hydrochlorid | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 8 M urea, 6 M guanidine hydrochlorid | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 8 M urea, 6 M guanidine hydrochlorid | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 8 M urea, 6 M guanidine hydrochlorid |
| Storage solvent and temperature | 20% ethanol, 4-30℃ | 20% ethanol, 4-30℃ | 20% ethanol, 4-30℃ | 20% ethanol, 4-30℃ |

## Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Tanrose 4B | 00052-00001 | 25 ml |  |
| | 00052-00002 | 100 ml | |
| | 00052-00003 | 500 ml | |
| | 00052-00004 | 1 L | |
| Tanrose CL-4B | 00052-10001 | 25 ml | |
| | 00052-10002 | 100 ml | |
| | 00052-10003 | 500 ml | |
| | 00052-10004 | 1 L | |
| Tanrose 6B | 00053-00001 | 25 ml | |
| | 00053-00002 | 100 ml | |
| | 00053-00003 | 500 ml | |
| | 00053-00004 | 1 L | |
| Tanrose CL-6B | 00053-10001 | 25 ml | |
| | 00053-10002 | 100 ml | |
| | 00053-10003 | 500 ml | |
| | 00053-10004 | 1 L | |

# ION-EXCHANGE CHROMATOGRAPHY MEDIA

## Introduction

The separation of proteins by ion exchange chromatography is carried out according to the different charges of proteins under a certain pH condition. Due to most biological molecules have acidic or alkaline groups, anion exchange media can bind with the negatively charged proteins whilst cation exchange media can bind with the positively charged proteins. Through adjusting the pH of buffer, proteins with poor binding capacity will be eluted first, proteins with strong binding capacity will be eluted later.

## Advantages

* Good maneuverability
* Fast flow rate, high productivity
* Moderate bead, good resolution
* Good physical and chemical stability, suitable for the initial capture or moderate purification of various sizes of biomolecules
* High purification technique, can be used in combination with hydrophobic chromatography

## Classification and features

Ion-exchange media consist of bead structure and functional group. It can be divided into cation exchange and anion exchange according to the charged property of the functional group. It also can be divided into strong ion-exchange groups and weak ion-exchange groups in line with ionization conditions in solution. Commonly used ion-exchange groups include the following:

| Group | SP | S | CM | Q | DEAE |
|---|---|---|---|---|---|
| Classification | Strong cation | Strong cation | Weak cation | Strong anion | Weak anion |

## Q/SP/DEAE/CM Tanrose FF Ion-exchange Medium

Medium which takes 6% cross-linked agarose as matrix with an average bead size of 90 μm has fast flow rate and wide range of application. It is the preferred choice for separation and purification of large-scale biomolecules.

### Technical parameters

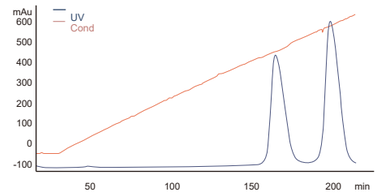
| Name | Q Tanrose 6FF | SP Tanrose 6FF | DEAE Tanrose 6FF | CM Tanrose 6FF |
|---|---|---|---|---|
| Type | Strong anion exchange | Strong cation exchange | Weak anion exchange | Weak cation exchange |
| Bead structure | 6% agarose | 6% agarose | 6% agarose | 6% agarose |
| Mean particle size and range | 90 μm, 45-165 μm | 90 μm, 45-165 μm | 90 μm, 45-165 μm | 90 μm, 45-165 μm |
| Ligand density | 180-250 μmol Cl-/ml | 180-250 μmol H+/ml | 110-1600 μmol Cl-/ml | 90-130 μmol H+/ml |
| Protein adsorption capacity | 120mg HSA/mL | 70mg ribonuclease A/mL | 110mg HSA/mL | Carboxymethyl |
| Functional group | Quaternary amino | Sulfopropyl | Diethylaminoethyl | 50mg ribonuclease A/mL |
| Flow rate | 50-300 cm/h | 50-300 cm/h | 50-300 cm/h | 50-300 cm/h |
| pH stability | 2-12 (long term), 2-14 (short term) | 4-13 (long term), 2-14 (short term) | 2-9 (short term) | 6-10 (short term) |
| Chemical stability | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 6 M guanidine hydrochloride, 8 M urea | | | |
| Storage solution and temperature | 20% ethanol, 4-30℃ | 20% ethanol, 0.2 M sodium acetate, 4-30℃ | 20% ethanol, 4-30℃ | 20% ethanol, 4-30℃ |



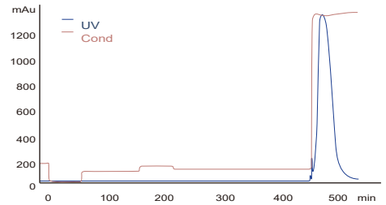


## Application

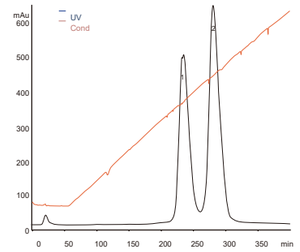
1) Q Tanrose 6FF, separation of β-lactoglobulin:
Sample: 10 mg / ml β-lactoglobulin
Binding buffer: 20 mM piperazine, pH = 6.5
Eluting buffer: 0.1 M NaCl, 20 mM piperazine, pH = 6.5
0.3 M NaCl, 20 mM piperazine, pH = 6.5
Elution method: gradient elution
Elution peaks:1. β-lactoglobulin B, 2. β-lactoglobulin A




2) SP Tanrose 6FF, purification of Lysozyme:
Column: PreLoad 50/20 SP 6FF
Binding buffer: 20 mM NaAc, pH 4.75
Eluting buffer: 0.15 M NaCl, 20 mM PB, pH 7.5




3) DEAE Tanrose 6FF, separation of β-lactoglobulin
Sample:10mg/ml β-lactoglobulin
Binding buffer: 20 mM piperazine, pH = 6.5
Eluting buffer:0.1 M NaCl, 20mM piperazine, pH = 6.5
0.3 M NaCl, 20mM piperazine, pH = 6.5
Elution method: gradient elution
Elution peaks: 1. β-lactoglobulin B, 2. β-lactoglobulin A




### Ordering information

| Product | P/N | Specification | Product | P/N | Specification | Picture |
|---|---|---|---|---|---|---|
| Q Tanrose 6FF | 00062-23001 | 25 ml | DEAE Tanrose 6FF | 00062-13001 | 25 ml |  |
| | 00062-23002 | 100 ml | | 00062-13002 | 100 ml | |
| | 00062-23003 | 500 ml | | 00062-13003 | 500 ml | |
| | 00062-23004 | 1 L | | 00062-13004 | 1 L | |
| SP Tanrose 6FF | 00062-33001 | 25 ml | CM Tanrose 6FF | 00062-53001 | 25 ml | |
| | 00062-33002 | 100 ml | | 00062-53002 | 100 ml | |
| | 00062-33003 | 500 ml | | 00062-53003 | 500 ml | |
| | 00062-33004 | 1 L | | 00062-53004 | 1 L | |

## Q / SP TANROSE HP ION-EXCHANGE MEDIUM

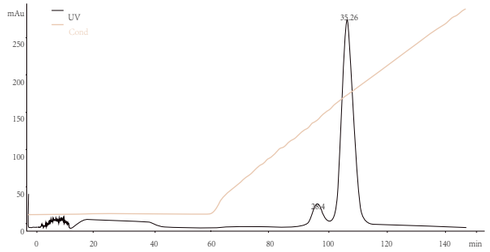
This series of media adopt 6% agarose with an average bead size of 34μm, suitable for the moderate and fine purification stages of biomolecules.

### Technical parameters

| Name | Q Tanrose 6HP | SP Tanrose 6HP |
|---|---|---|
| Type | Strong anion exchange | Strong cation exchange |
| Bead structure | 6% agarose | 6% agarose |
| Mean particle size and range | 34 μm, 25-45 μm | 34 μm, 25-45 μm |
| Ligand density | 140-200 μmol Cl-/ml | 150-250 μmol H+/ml |
| Protein adsorption capacity | 70mg BSA/mL | 55mg ribonuclease A/mL |
| Functional group | Quaternary amino | Sulfopropyl |
| pH stability | 60-120 cm/h | 60-120 cm/h |
| Flow rate | 2-12 (long term), 2-14 (short term) | 4-13 (long term), 2-14 (short term) |
| Chemical stability | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 6 M guanidine hydrochloride, 8 M urea | |
| Storage solvent and temperature | 20% ethanol, 4-30℃ | 20% ethanol, 0.2 M sodium acetate, 4-30℃ |

### Application

Q Tanrose 6HP, separation of biological samples provided by customer
Column: PreLoad 16/10 Q 6HP
Sample: biological sample provided by customer
Binding buffer: 50 mM Tris. pH 8.0
Eluting buffer: 1 M NaCl, 50 mM Tris




### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Q Tanrose 6HP | 00062-22001 | 25 ml |  |
| | 00062-22002 | 100 ml | |
| | 00062-22003 | 500 ml | |
| | 00062-22004 | 1 L | |
| SP Tanrose 6HP | 00062-32001 | 25 ml | |
| | 00062-32002 | 100 ml | |
| | 00062-32003 | 500 ml | |
| | 00062-32004 | 1 L | |





## Q / SP TANROSE XL ION-EXCHANGE MEDIUM

This resin uses 6% agarose as the base and dextran as the spacer, increasing functional group density and reducing steric hindrance between biomolecules to improve binding capacity. It can process samples at high flow rates and is typically used for the initial capture and enrichment of target proteins, with fast flow rates and high loading capacity allowing for rapid capture from solution.

### Technical parameters

| Name | Q Tanrose XL | SP Tanrose XL |
|---|---|---|
| Type | Strong anion exchange | Strong cation exchange |
| Bead structure | 6% agarose with dextran chain | 6% agarose with dextran chain |
| Mean particle size and range | 90 μm, 45-165 μm | 90 μm, 45-165 μm |
| Ligand density | 180-260 μmol Cl-/ml | 180-250 μmol H+/ml |
| Protein adsorption capacity | 130mg BSA/mL | 160mg lysozyme/mL |
| Functional group | Quaternary amino | Sulfopropyl |
| pH stability | 300-500 cm/h | 300-500 cm/h |
| Flow rate | 2-12 (long term), 2-14 (short term) | 4-13 (long term), 2-14 (short term) |
| Chemical stability | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 6 M guanidine hydrochloride, 8 M urea | |
| Storage solvent and temperature | 20% ethanol, 4-30℃ | 20% ethanol, 0.2 M sodium acetate, 4-30℃ |

### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Q Tanrose XL | 00062-21001 | 25 ml |  |
| | 00062-21002 | 100 ml | |
| | 00062-21003 | 500 ml | |
| | 00062-21004 | 1 L | |
| SP Tanrose XL | 00062-31001 | 25 ml | |
| | 00062-31002 | 100 ml | |
| | 00062-31003 | 500 ml | |
| | 00062-31004 | 1 L | |

## Q / SP TANROSE BB ION-EXCHANGE MEDIUM

This series of media adopt 6% agarose with its average bead size of 200 um, suitable for the capture and large-scale industrial production of strong viscosity samples.

### Technical parameters

| Name | Q Tanrose 6BB | SP Tanrose 6BB |
|---|---|---|
| Type | Strong anion exchange | Strong cation exchange |
| Bead structure | 6% agarose | 6% agarose |
| Mean particle size and range | 200 μm, 100-300 μm | 200 μm, 100-300 μm |
| Ligand density | 180-250 μmol Cl-/ml | 180-250 μmol H+/ml |
| Functional group | Quaternary amino | Sulfopropyl |
| Flow rate | 200-600 cm/h | 200-600 cm/h |
| pH stability | 2-12 (long term), 2-14 (short term) | 4-13 (long term), 2-14 (short term) |
| Chemical stability | 2 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 6 M guanidine hydrochloride, 8 M urea | |
| Storage solution and temperature | 20% ethanol, 4-30℃ | 20% ethanol, 0.2 M sodium acetate, 4-30℃ |

### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Q Tanrose 6BB | 00062-24001 | 25mL |  |
| | 00062-24002 | 100mL | |
| | 00062-24003 | 500mL | |
| | 00062-24004 | 1L | |
| SP Tanrose 6BB | 00062-34001 | 25mL | |
| | 00062-34002 | 100mL | |
| | 00062-34003 | 500mL | |
| | 00062-34004 | 1L | |

## DEAE / CM Tandex Ion Exchange Medium

CM Tandex C-25 is a weak cation exchange medium, which is formed by coupling carboxymethyl groups to Tandex G-25.
DEAE Tanrose A-25 is a weak anion exchange medium, which is formed by coupling diethyl aminoethyl to Tandex G-25.

### Technical parameters

| Name | CM Tandex C-25 | DEAE Tandex A-25 |
|---|---|---|
| Type | Weak cation exchange | Weak anion exchange |
| Bead structure | Dextran | |
| Ligand density | 4-5 mmol/g | 3-4 mmol/g |
| Bead size | 40-120 μm | 40-120 μm |
| pH stability | 2-12 (long term), 2-13 (short term) | 2-12 (long term), 2-14 (short term) |
| Chemical stability | Common aqueous solution: 30% isopropanol, 70% ethanol, 6 M guanidine hydrochloride | |
| Storage solvent and temperature | 20% ethanol, 4-30 C | |

### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| CM Tandex C-25 | 00061-50001 | 25g |  |
| | 00061-50002 | 100g | |
| | 00061-50003 | 500g | |
| | 00061-50004 | 1000g | |
| DEAE Tandex A25 | 00061-10001 | 25g | |
| | 00061-10002 | 100g | |
| | 00061-10003 | 500g | |
| | 00061-10004 | 1000g | |





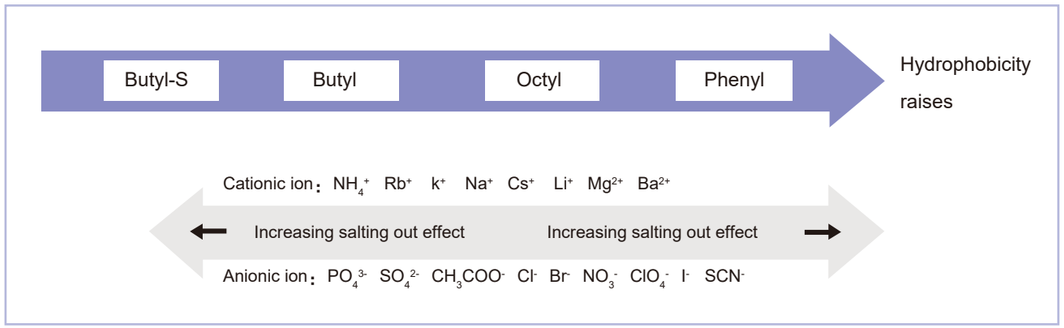
## HYDROPHOBIC CHROMATOGRAPHY MEIDIA

Hydrophobic chromatography is a method to separate biological macromolecules according to their surface hydrophobicity. Some hydrophobic groups are often exposed to the surface of biological macromolecules (such as proteins and peptides). Hydrophobic groups can bind with hydrophobic chromatography media by hydrophobic interaction. Due to the different hydrophobicity of various molecules, the hydrophobic effect between molecules and media is different. Hydrophobic chromatography separates and purifies biological macromolecules according to this principle.
The key to choosing the hydrophobic chromatography medium is to select ligand with appropriate hydrophobic effect. Proteins with strong hydrophobicity need to match medium with weak hydrophobicity, and vice versa. In order to enhance the combination of protein and hydrophobic medium, a certain amount of salts (usually ammonium sulfate) need to be added in the buffer. If protein itself has strong hydrophobicity, there is no need to add too much salt. For the purpose of improving the resolution, the hydrophobic medium with smaller beads can be selected.

### Factors influencing hydrophobic chromatography

*The hydrophobicity of a protein depends on the distribution of hydrophobic groups on its surface.

*Some ions in the buffer contribute stability to the conformation of proteins. For example, $SO_4^{2-}$ can improve the stability of protein structure, reduce the solubility of proteins, have salting-out effect on proteins, and enhance the hydrophobic effect between proteins and ligands. Some ions contribute instability to the conformation of proteins, for instance, $Cl^-$, $Ca^{2+}$ can increase the solubility of protein, and these ions usually have strong elution ability. The characteristics of salting out and salt solution can be used as the basis for choosing the equilibrium and elution conditions of hydrophobic media.




*In the process of hydrophobic chromatography, the higher the temperature, the stronger the hydrophobic effect, which helps improve separation degree of chromatography columns. However, for bioactive substances, high temperature will lead to denaturation and inactivation. Therefore, it is recommended to keep room temperature or low temperature during the process of hydrophobic chromatography.
*Neutral phosphate buffer is usually used as the mobile phase of hydrophobic chromatography. With the increase of pH, the interaction between proteins and hydrophobic groups will decrease, because charge of acidic groups of proteins and hydrophilicity of proteins increases as pH increases. However, method that changing the pH of the solution is rarely adopted to change hydrophobicity of proteins in hydrophobic chromatography.

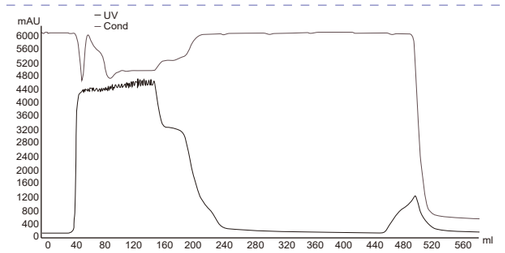
# TANROSE FF FAST FLOW HIC MEDIUMS (PHENYL/BUTYL/OCTYL/BUTYL-S)

Phenyl, Butyl, Octyl, and Butyl-Tanrose are different hydrophobic chromatography media that remove various impurities, such as lipids, lipoproteins, and pigments, under different purification conditions. Phenyl Tanrose has the strongest hydrophobicity, while Butyl-Tanrose has the weakest. Butyl-Tanrose plays a crucial role in purifying hepatitis B vaccine during yeast recombinant expression.

## Technical parameters

| Name | Phenyl Tanrose 6FF (Low Sub) | Phenyl Tanrose 6FF (High Sub) | Butyl-S Tanrose 6FF | Octyl Tanrose 4FF | Butyl Tanrose 4FF |
|---|---|---|---|---|---|
| Bead structure | 6% highly cross-linked agarose | | | 4% highly cross-linked agarose | |
| Mean particle size and range | 90 μm, 45-165 μm | 90 μm, 45-165 μm | 90 μm, 45-165 μm | 90 μm, 45-165 μm | 90 μm, 45-165 μm |
| Ligand density | 20 μmol/ml | 40 μmol/ml | 10 μmol/ml | 5 μmol/ml | 40 μmol/ml |
| Protein adsorption capacity | 24mg HSA/mL | 36mg HSA/mL | / | 7mg HSA/mL | 26mg HSA/mL |
| Functional group | Phenyl | Phenyl | Butyl-S | Octyl | Butyl |
| Flow rate | 250-400 cm/h | | | ≥150 cm/h | |
| Operating pressure | 0.3 MPa | | | | |
| pH stability | 3-12 (long term), 2-14 (short term) | | | | |
| Chemical stability | 1 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 6 M guanidine hydrochloride, 8 M urea | | | | |
| Storage solvent and temperature | 20% ethanol, 4-30℃ | | | | |

## Application




Butyl-S Tanrose 6FF Purified yeast expressed recombinant hepatitis B vaccine

## Ordering information

| Product | P/N | Specification | Product | P/N | Specification |
|---|---|---|---|---|---|
| Phenyl Tanrose 6FF(HS) | 00071-42001 | 25mL | Phenyl Tanrose 6FF(LS) | 00071-41001 | 25mL |
| | 00071-42002 | 100mL | | 00071-41002 | 100mL |
| | 00071-42003 | 500mL | | 00071-41003 | 500mL |
| | 00071-42004 | 1L | | 00071-41004 | 1L |
| Butyl-S Tanrose 6FF | 00071-14001 | 25mL | Butyl Tanrose 4FF | 00071-24001 | 25mL |
| | 00071-14002 | 100mL | | 00071-24002 | 100mL |
| | 00071-14003 | 500mL | | 00071-24003 | 500mL |
| | 00071-14004 | 1L | | 00071-24004 | 1L |
| Octyl Tanrose 4FF | 00071-34001 | 25mL |  | | |
| | 00071-34002 | 100mL | | | |
| | 00071-34003 | 500mL | | | |
| | 00071-34004 | 1L | | | |





# PHENYL/BUTYL/OCTYL TANROSE HP HIGH PERFORMANCE HYDROPHOBIC CHROMATOGRAPHY MEDIUM

Hydrophobic interaction chromatography (HIC) Tanrose HP series media retain the hydrophilicity and pore structure of natural polysaccharides, having good compatibility with biological macromolecules, especially suitable for the separation and purification of proteins, enzymes, nucleic acids, etc.

## Technical parameters

| Name | Phenyl Tanrose 6HP | Octyl Tanrose 6HP | Butyl Tanrose 6HP |
|---|---|---|---|
| Bead structure | 6% highly cross-linked agarose | | |
| Mean particle size and range | 34 μm, 25-45 μm | | |
| Ligand density | 25 μmol/ml | 50 μmol/ml | 50 μmol/ml |
| Functional group | Phenyl | Octyl | Butyl |
| Max. flow rate | 200 cm/h | | |
| Max. operating pressure | 0.3 MPa | | |
| pH stability | 3-12 (long term), 2-14 (short term) | | |
| Chemical stability | 1 M NaOH, 70% EtOH, 30% IPA, 30% ACN, 1% SDS, 6 M guanidine hydrochloride, 8 M urea | | |
| Storage solvent and temperature | 20% ethanol, 4-30℃ | | |

## Application

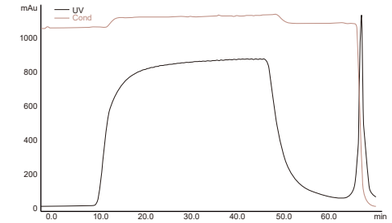
Column: PreLoad 50/20 Phenyl 6HP

Medium type: Phenyl Tanrose High Performance

Sample: 200 ml of sample made after rudimentary purification of recombinant protein

Equilibrium buffer: 20 mM PB, 1 M NaCl, pH 7.0

Eluting buffer: 20 mM PB, pH 7.0




Phenyl Tanrose High Performance for purification of recombinant protein with yeast expression(Remove small molecules in flow through mode)

## Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Phenyl Tanrose 6HP | 00071-43001 | 25mL |  |
| | 00071-43002 | 100mL | |
| | 00071-43003 | 500mL | |
| | 00071-43004 | 1L | |
| Octyl Tanrose 6HP | 00071-33001 | 25mL | |
| | 00071-33002 | 100mL | |
| | 00071-33003 | 500mL | |
| | 00071-33004 | 1L | |
| Butyl Tanrose 6HP | 00071-23001 | 25mL | |
| | 00071-23002 | 100mL | |
| | 00071-23003 | 500mL | |
| | 00071-23004 | 1L | |

# AFFINITY CHROMATOGRAPHY MEDIA

## Introduction

Affinity chromatography is a method to separate biomolecules based on the characteristics of specific recognition and reversible binding between biomolecules and some corresponding specific molecules. Affinity chromatography is an very effective method to separate proteins, which usually takes one step to obtain proteins of high purity. Proteins are separated according to their specificity to specific ligands rather than their covalent binding capacity.

## Features

*Efficient, fast and convenient

*Strong selectivity

*Usually take one step to obtain proteins of high purity

*High recovery rate

## Composition of Affinity Medium

Structure: agarose, such as Tanrose FF, Solid Mustang, etc.

Ligand: a substance that interacts specifically with a target molecule.





## Protein G 4FF Antibody Affinity Medium

Protein G Tanrose 4FF is an affinity medium made by cyanogen activation of Protein G immobilized on the Tanrose 4FF matrix. It is used as an affinity chromatography medium for the separation and purification of IgG, often used to isolate and purify antibodies or antibody fragments from cell culture. Recombinant protein G contains high affinity binding sites, reducing non-specific adsorption. Protein G has different IgG binding characteristics compared to Protein A. Compared to Protein A, Protein G has stronger binding affinity for multi-clonal antibodies from cows, sheep, horses, etc. It can also bind to rat IgG, human IgG3, and mouse IgG1, which do not bind well to Protein A.

## Technical parameters

| Name | Protein G Tanrose 4FF |
|---|---|
| Bead structure | 4% highly cross-linked agarose |
| Bead size range | 45-165 μm |
| Mean particle size | 90 μm |
| Binding capacity | ~20 mg (human IgG)/ml (media) |
| pH stability | 3-9 (long term), 2-10 (short term) |
| Chemical stability | 40°C, 1 week: 1M sodium hydroxide, 6M guanidine hydrochloride, 70% ethanol. |
| Max. flow rate | 300 cm/h |
| Operating pressure | ≤0.3 MPa |
| Storage solvent | 20% ethanol |
| Storage temperature | 4-8℃ |

## Application

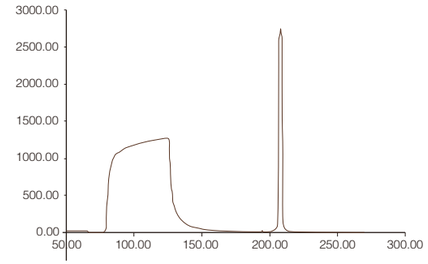
Chromatography column: PreCot Protein G 4FF 1mL

Medium type: Protein G Tanrose 4FF

Equilibration buffer solution: 10mM PBS, pH 7.2

Elution buffer solution: 0.1M glycine, pH 3.0

Sample: Human plasma.




## Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Protein G Tanrose 4FF | 00081-12001 | 5 mL |  |
| | 00081-12002 | 25 mL | |
| | 00081-12003 | 200 mL | |
| | 00081-12004 | 1 L | |

# NI TANROSE 6FF(NTA/IDA)/NI TANROSE 6HP(NTA)/NI TANROSE 4FF (NTA/IDA)METAL CHELATING AFFINITY MEDIA

Ni Tanrose 6FF(NTA) / Ni Tanrose 6HP(NTA)/ Ni Tanrose 4FF(NTA) An affinity medium is a type of affinity chromatography medium that binds metal ions, such as Ni2+, to a gel made of agarose with nitrilotriacetic acid (NTA) as the ligand. This creates a metal chelating affinity layer that is more stable than the one formed by iminodiacetic acid (IDA) binding to Ni ions. Metal chelating affinity media are widely used in the separation and purification of proteins and peptides in downstream processes of biopharmaceuticals and biotechnology due to their high adsorption capacity, good selectivity, ease of regeneration, and low cost. They are particularly efficient in purifying histidine-tagged proteins.

Ni Tanrose 6FF(IDA)/ Ni Tanrose 4FF(IDA) Affinity media is a type of affinity chromatography medium that binds metal ions, such as Ni2+, to a gel made of agarose with iminodiacetic acid (IDA) as the ligand. It is a well-established Ni affinity resin, but due to the relatively low number of chelating bonds between Ni ions and the ligand, it is vulnerable to attack by small molecules, making it easy for Ni to detach. However, it has a relatively high loading capacity.

## Technical parameters

| Name | Ni Tanrose 6HP(NTA) | Ni Tanrose 6FF(NTA) | Ni Tanrose 6FF(IDA) |
|---|---|---|---|
| Matrix | Highly cross-linked 6% agarose | | |
| Particle size range | 25-45μm | 45-165μm | |
| Average particle size | 34μm | 90μm | |
| Binding capacity | 40mg(His tag protein)/mL(medium) | | 45mg(His tag protein)/mL(medium) |
| pH stability* | 3-12(long term)2-14(short term) | | 3-12(long term)2-14(short term) |
| Chemical stability* | 0.01M hydrochloric acid、0.01M Hydrogen Oxygen sodium chloride (1 week) 1M sodium hydroxide、70% Ethanol (12 hours) 2%SDS(1h) 30% Isopropanol (0.5 hours) | | All common aqueous solutions and buffers avoid the use of chelating agents (such as EDTAEGTA) and reducing agents (such as DTT and DTE) |
| Flow rate | 300cm/h | 600cm/h | |
| Operating pressure | ≤0.3MPa | | |
| Storage solution | 20% ethanol | | |
| Storage temperature | 4-30℃ | | |

| Name | Ni Tanrose 4FF(NTA) | Ni Tanrose 4FF(IDA) |
|---|---|---|
| Matrix | Highly cross-linked 6% agarose | |
| Particle size range | 45-165μm | |
| Average particle size | 90μm | |
| Binding capacity | 40 mg(His tag protein)/mL(medium) | 40 mg(His tag protein)/mL(medium) |
| pH stability* | 3-12(long term)2-14(short term) | 3-12(long term)2-14(short term) |
| Chemical stability* | 0.01M hydrochloric acid, 0.01M sodium hydroxide (one week) 1M sodium hydroxide, 70% ethanol (12 hours) 2% SDS (1 hour) 30% isopropanol (0.5 hours) | All common aqueous solutions and buffers avoid the use of chelating agents (e.g. EDTA, EGTA) and reducing agents (e.g. DTT and DTE) |
| Flow rate | 150-250cm/h | |
| Operating pressure | ≤0.1MPa | |
| Storage solution | 20% ethanol | |
| Storage temperature | 4-30℃ | |





# CO TANROSE 6FF (NTA/IDA) METAL-CHELATED AFFINITY MEDIUM

Co Tanrose 6FF (NTA) affinity medium is an affinity chromatography medium formed by combining metal ions Co on agarose gel with nitrilotriacetic acid (NTA) as a ligand. CoTanrose 6FF (NTA) can be obtained from prokaryotic and eukaryotic One-step purification of His-tagged proteins in the expression system, CoTanrose 6FF (NTA) has higher selectivity for His-tagged proteins than NiTanrose 6FF (NTA).

## Technical parameters

| Name | Co Tanrose 6FF(NTA) |
|---|---|
| Matrix | Highly cross-linked 6% agarose |
| Particle size range | 45-165μm |
| Average particle size | 90μm |
| Binding capacity | 20mg(His tag protein)/mL(medium) |
| Operating pressure | ≤0.3MPa |
| Storage solution | 20% ethanol |
| Storage temperature | 4-30℃ |

## Application

Chromatographic column: PreCot Ni 6FF (NTA) 1mL

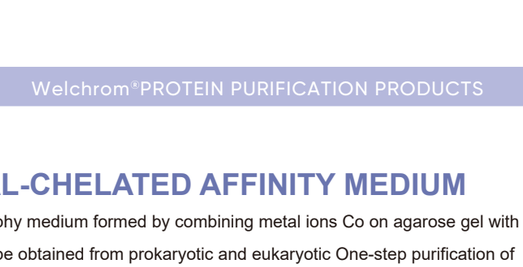
Binding buffer A: 50mM Tris-HCl, 0.5M NaCl, 20mM imidazole, pH8.0

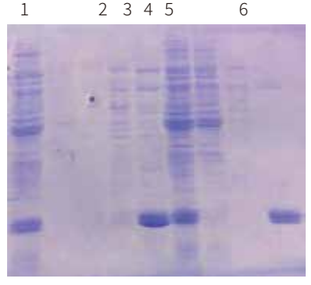
Elution buffer B: 50mM Tris-HCl, 0.5M NaCl, 0.5M imidazole, pH8.0

Sample: Escherichia coli expressing recombinant protein with histidine (His) tag

Flow rate: Equilibrium, elution-1.0mL/min

Sample Loading-0.5mL/min



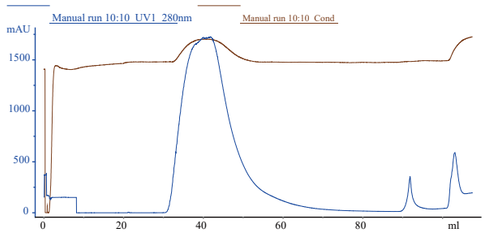

1：stock solution
2：flow through
3：elution (100%B)

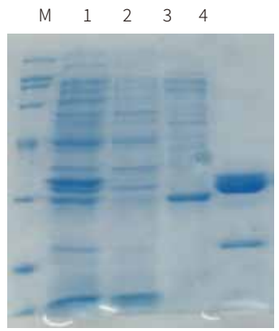
4：stock solution
5：flow through
6：elution (100%B)

Remarks: 1-3 (the sample and the balance solution do not contain mime); 4-6 (the sample and the balance solution contain 20mM mime)

## Applications

Chromatographic column: PreCot Ni6FF(IDA)1mL
Binding buffer sol A: 50mMTris-HCl，0.5M NaC，PH7.0
Elution buffer B: 50mM Trs-HCl、0.5M NaCl imidazole
Sample: Escherichia coli expresses a recombinant protein with histidine (His) tag
Elution program: Equilibrate with equilibrium solvent A
Wash with 4% eluent B
Eluet with 100% eluent B
Flow rate:Equilibrium,,elution-1.0mL/min Sample Loading-0.5mL/min




1：stock solution
2：flow through
3：washing
4：elution

### Ordering information

| Product | P/N | Specification | Product | P/N | Specification | Picture |
|---|---|---|---|---|---|---|
| Ni Tanrose 6FF (NTA) | 00082-03001 | 25mL | Ni Tanrose 6HP (NTA) | 00082-09001 | 25mL |  |
| | 00082-03002 | 100mL | | 00082-09002 | 100mL | |
| | 00082-03003 | 500mL | | 00082-09003 | 500mL | |
| | 00082-03004 | 1L | | 00082-09004 | 1L | |
| Ni Tanrose 6FF (IDA) | 00082-06001 | 25mL | Co Tanrose 6FF (NTA) | 00082-07001 | 25mL |  |
| | 00082-06002 | 100mL | | 00082-07002 | 100mL | |
| | 00082-06003 | 500mL | | 00082-07003 | 500mL | |
| | 00082-06004 | 1L | | 00082-07004 | 1L | |
| Ni Tanrose 4FF (NTA) | 00081-04001 | 25mL | Ni Tanrose 4FF (IDA) | 00081-05001 | 25mL | |
| | 00081-04002 | 100mL | | 00081-05002 | 100mL | |
| | 00081-04003 | 500mL | | 00081-05003 | 500mL | |
| | 00081-04004 | 1L | | 00081-05004 | 1L | |





# IMAC TANROSE 6FF/CHELATING TANROSE 6FF METAL-CHELATED AFFINITY MEDIUM

IMAC Tanrose 6FF/Chelating Tanrose 6FF are composed by that 6% highly cross-linked agarose beads modified with a novel chelating ligand immobilized to the base matrix. They are supplied free of metal ions, equivalent to Ni Tanrose 6FF (NTA) and Ni Tanrose 6FF (IDA) which are not chelated to Ni ions. They can be widely used in the separation and purification of proteins and peptides. The principle is to use the side chains of histidine, cysteine, and tryptophan of proteins to interact with various transition metal ions such as $Cu^{2+}$, $Zn^{2+}$, $Ni^{2+}$, $Co^{2+}$, and $Fe^{2+}$ to achieve the purpose of separation and purification.

IMAC Tanrose 6FF is formed by coupling aminotriacetic acid (NTA) to agarose. It can chelate four valences of metal ions, which makes chelated metal ions more stable and withstand higher reducing agents with good physical and chemical stability. It has characteristics of great specificity and fast flow rate.

Chelating Tanrose 6FF is formed by coupling iminodiacetic acid (IDA) to agarose. The ligands of Chelating Tanrose 6FF media can provide 3 coordination sites to chelate with metal ions, and simultaneously provide three ionic bond sites with high affinity to purify the target protein. IMAC Tanrose 6FF media can provide four coordination sites to chelate with metal ions and two ionic bond binding sites to purify the target protein, which means that Chelating Tanrose 6FF medium has stronger affinity than IMAC Tanrose 6FF under the same ligand density and metal ion conditions. All samples that cannot be adsorbed in IMAC Tanrose 6FF medium can choose to bind with Chelating Tanrose 6FF.

### Technical parameters

| Name | IMAC Tanrose 6FF | Chelating Tanrose 6FF |
|---|---|---|
| Bead structure | 6% highly cross-linked agarose | |
| Bead size range | 45-165 μm | |
| Mean particle size | 90 μm | |
| Binding capacity | 25 μmol $Cu^{2+}$ /ml (media) 15 μmol $Ni^{2+}$ /$Zn^{2+}$ ml (media) | 34 μmol $Cu^{2+}$ /ml (media) |
| pH stability | 3-12 (long term), 2-14 (short term) | 3-13 (long term), 2-14 (short term) |
| Chemical stability | 0.01 M HCl, 0.1 M NaOH, 8 M urea, 6 M guanidine hydrochloride (one week) 1M sodium hydroxide, 70% acetic acid (12 hours) | Stable in common aqueous solutions, 1 M NaOH, 8 M urea, 6 M guanidine hydrochloride |
| Flow rate | 600 cm/h | |
| Operating pressure | ≤0.3 MPa | |
| Avoid using | EDTA, EGTA, citrate, histidine | EDTA, EGTA, citrate, histidine, β-mercaptoethanol, DTT |
| Storage solvent and temperature | 20% ethanol, 4-30℃ | 20% ethanol, 4-30℃ |

### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| IMAC Tanrose 6FF | 00082-01001 | 25 ml |  |
| | 00082-01002 | 100 ml | |
| | 00082-01003 | 500 ml | |
| | 00082-01004 | 1 L | |
| Chelating Tanrose 6FF | 00082-02001 | 25 ml | |
| | 00082-02002 | 100 ml | |
| | 00082-02003 | 500 ml | |
| | 00082-02004 | 1 L | |

# BENZAMIDINE TANROSE 4FF BENZAMIDINE AFFINITY MEDIUM

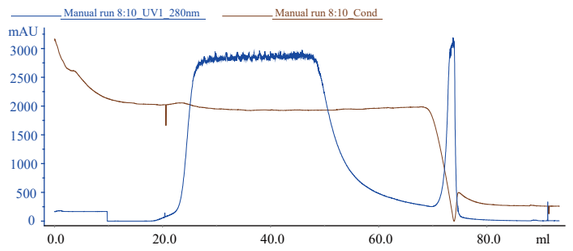
Benzamidine Tanrose 4FF is an affinity chromatography medium formed by coupling p-aminobenzidine to agarose gel Tanrose 4FF. It is commonly used for the separation and purification of serine protease or the removal of serine protease from biological samples. The benzamidine substance is a broad-spectrum inhibitor of serine protease (such as trypsin, thrombin, urokinase, kallikrein, prokinin, etc.), so this medium can purify such substances.

## Technical parameters

| Name | Benzamidine Tanrose 4FF |
|---|---|
| Bead structure | 4% highly cross-linked agarose |
| Bead size range | 45-165 μm |
| Mean particle size | 90 μm |
| Ligand | P-aminophenamidine |
| Binding capacity | 35 mg (trypsin)/ ml (media) |
| pH stability | 1-9 (short term), 2-8 (long term) |
| Chemical stability | All commonly used buffer solutions, 8 M urea, 6 M guanidine hydrochloride |
| Flow rate | 300 cm/h |
| Operating pressure | ≤0.3 MPa |
| Storage solvent | 0.05 M acetate buffer, 20% ethanol, pH 4.0 |
| Storage temperature | 4-8℃ |

## Application

Column: PreCot 5ml Benzamidine Tanrose 4FF
Sample: trypsin mixture
Binding buffer: 50 mM PB, 50 mM NaCl pH 7.0
Eluting buffer: 0.1 M Gly pH 2.7
(200 μl of 1 M Tris-HCl, pH 9.0 should be added to the eluent collection tube in advance)
Flow rate: 0.7 ml/min




## Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Benzamidine Tanrose 4FF | 00081-11001 | 25 mL |  |
| | 00081-11002 | 100 mL | |
| | 00081-11003 | 500 mL | |
| | 00081-11004 | 1 L | |





# GST TANROSE 4FF GLUTATHIONE AFFINITY MEDIUM

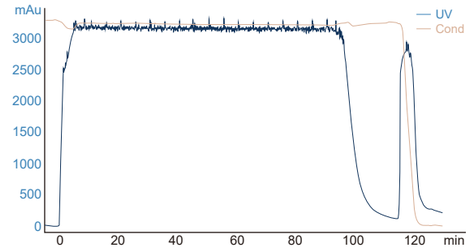
GST Tanrose 4FF is formed by coupling glutathione to agarose. It is specifically used for the specific purification of Glutathione S-Transferase (GST) and GST fusion proteins. The GST tag is a commonly used tag in modern genetic engineering to express fusion proteins, which is conducive to the soluble expression and maintenance of activity of proteins. The purification principle is to fuse and express the glutathione transferase with the target protein. Through the interaction of glutathione transferase and glutathione ligand, the protein fused with GST tag can be purified.

## Technical parameters

| Name | GST Tanrose 4FF |
|---|---|
| Bead structure | 4% highly cross-linked agrose |
| Bead size range | 45-165 μm |
| Mean particle size | 90 μm |
| Binding capacity | 10 mg (GST tag protein) /ml (media) |
| pH stability | 3-12 |
| Chemical stability | All commonly used aqueous solutions, such as 1 M acetate, pH 4.0, 0.1 M NaOH, 70% ethanol, 8 M urea, 6 M guanidine hydrochloride (room temperature, 1 hour) |
| Flow rate | ≤450 cm/h |
| Operating pressure | ≤0.3 MPa |
| Storage solvent | 20% ethanol |
| Storage temperature | 4-30℃ |

## Application

Column: PreCot 5ml GST 4FF
Sample: recombinant expression of GST tag protein
Binding buffer: 20 mM PB, 150 mM NaCl pH 7.4
Eluting buffer: 15 mM reduced glutathione, 50 mM Tris pH 8.0




## Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| GST Tanrose 4FF | 00081-10001 | 25 mL |  |
| | 00081-10001 | 100 mL | |
| | 00081-10003 | 500 mL | |
| | 00081-10004 | 1 L | |

## HEPARIN TANROSE 6FF / HEPARIN TANROSE 6HP ARE HEPARIN AFFINITY MEDIA.

Heparin Tanrose 6FF medium is composed of 6% highly cross-linked agarose which takes heparin as ligand. It has characteristics of physical and chemical stability, hard to loss, long life and wide range of application.

Heparin is a kind of sulfated acidic polysaccharide, which can bind with anticoagulation factor III, thrombin, thrombin-like, human coagulation factors IX, XI and VIII. In addition, Heparin can also bind with human interleukin and human prostate growth factor, recombinant human vascular endothelial growth factor, cartilage growth factor, basic fibroblast growth factor, recombinant human acidic fibroblast growth factor, recombinant hepatocyte growth factor, recombinant mouse heparin cofactor II, recombinant human platelet fourth factor, recombinant human endostatin, recombinant human keratinocyte growth factor and other biological macromolecules which are expressed by E. coli, so heparin agarose gel can be used for the purification of such substances.

### Technical parameters

| Name | Heparin Tanrose 6FF | Heparin Tanrose 6HP |
|---|---|---|
| Matrix | Highly cross-linked 6% agarose | Highly cross-linked 6% agarose |
| Particle size range | 45-165um, 90μm | 25-45um, 34μm |
| Functional group | Heparin Sodium | Heparin Sodium |
| Ligand density | 4mg/mL medium | 10mg/mL medium |
| pH stability | 3-12 | 3-12 |
| Chemical stability | All commonly used aqueous solutions, such as: 50mM acetate (pH4.0) 0.1M NaOH (20°C, one week), 70% ethanol 8M urea, 6M quatrine hydrochloride. | All common aqueous solutions such as: 50mM acetate (pH4.0) 0.1M NaOH (0°C, one week), 70%% ethanol, 8M urea, 6M melon hydrochloride |
| Maximum flow rate | 600cm/h | 300cm/h |
| Operating pressure | ≤0.3 MPa | ≤0.3 MPa |
| Storage solution | 0.05 M sodium acetate + 20% ethanol | 0.05 M sodium acetate + 20% ethanol |
| Storage temperature | 4-30℃ | 4-30℃ |

### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Heparin Tanrose 6FF | 00082-18001 | 25mL |  |
| | 00082-18002 | 100mL | |
| | 00082-18003 | 500ml | |
| | 00082-18004 | 1L | |
| Heparin Tanrose 6HP | 00082-17001 | 25mL | |
| | 00082-17002 | 100mL | |
| | 00082-17003 | 500ml | |
| | 00082-17004 | 1L | |

## ENDOTOXIN REM TANROSE 4FF AFFINITY MEDIUM

Endotoxin rem Tanrose 4FF affinity medium takes self-made agarose gel as the matrix and polymyxin B as the ligand. It can be used to remove the endotoxin in biogenic protein products such as peptide, antibody, polysaccharide, etc. This product has good chemical and physical stability and good biocompatibility. Moreover, the ligands are stable and can be reused.





### Technical parameters

| Name | Endotoxin rem Tanrose 4FF |
|---|---|
| Bead structure | 4% cross-linked agarose gel |
| Ligand | Polybacterin B |
| Shape | Spherical |
| Mean particle size | 90 μm, (45-165 μm) |
| Ligand density | 5 mg/ml (media) |
| Binding capacity | 5,000-10,000 EU / ml media |
| Max. flow rate | 300 cm/h |
| Ideal flow rate(25℃) | 100 cm/h |
| Max. operating pressure | 0.3 MPa (3 bar) |
| pH stability | 3 -10 (long term), 2 -13 (short term) |
| Chemical stability | 30% isopropanol, 8 M urea, 6 M guanidine hydrochloride |
| Storage condition | 4-8℃, 20% ethanol |

### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| Endotoxin rem Tanrose 4FF | 00081-16001 | 10 mL |  |
| | 00081-16002 | 25 mL | |
| | 00081-16003 | 100 mL | |
| | 00081-16004 | 500 mL | |

## NHS-ACTIVATED TANROSE 4FF/ CNBR-ACTIVIATED TANROSE 4FF PRE-ACTIVATED AFFINITY MEDIUM

CNBr-activated Tanrose4FF is a cyanogen bromide pre-activated sepharose sugar medium suitable for coupling proteins and other biomolecules containing amino groups.

*The reaction conditions with large molecules such as proteins are mild.

*Biopolymers can be directly coupled without the need for coupling spacers.

*Ligands and frameworks can form multi-point couplings, making the medium more stable

*The flexibility of ligand coupling significantly improves the specificity of purification.

### Technical parameters

| Name | NHS-activiated Tanrose 4FF | CNBr-activiated Tanrose 4FF |
|---|---|---|
| Bead structure | 4% highly cross-linked agarose | |
| Activated group | N-hydroxysuccinimide | cyanogen bromide |
| Ligand density | 16-23 μmol/mL (media) | 13-26mg4- Chymotrypsinogen /mL Medium |
| Coupling functional group | $-NH_2$ | |
| Mean particle size | 90 μm (45~165 μm) | |
| Max. operating pressure | 0.3 MPa (3 bar) | |
| Ideal flow rate | 150 cm/h | |
| Chemical stability | 30% isopropanol, 8 M urea, 6 M guanidine hydrochloride. | |
| pH stability | 3-13 (long term), 2-13 (short term) | 3-13 (long term), 2-11 (short term) |
| Condition | 4~8℃ (20% ethanol) | 4~8℃ (100% isopropanol) |

### Ordering information

| Product | P/N | Specification | Product | P/N | Specification | Picture |
|---|---|---|---|---|---|---|
| NHS-activiated Tanrose 4FF | 00081-00101 | 25mL | CNBr-activiated Tanrose 4FF | 00081-00201 | 25mL |  |
| | 00081-00102 | 100mL | | 00081-00202 | 100mL | |
| | 00081-00103 | 500mL | | 00081-00203 | 500mL | |
| | 00081-00104 | 1L | | 00081-00204 | 1L | |

## EMPTY COLUMN

Welch Materials provides empty columns with diameters from 0.7 cm to 45 cm to meet the demand of various scales and applications.

## WELCOT 10 EMPTY COLUMN

WelCot 10 column body is made of high-purity medical grade polypropylene. The frit is processed with pure high-molecular-weight polyethylene, which can withstand acid, alkali and general organic solvents and has a wide range of biological compatibility. After packing, proteins can be purified by gravity flow

### Technical parameters

| | |
|---|---|
| Composition | One upper and one lower cover, tube, two frits |
| Frit material | Polyethylene |
| Tube material | Polypropylene |

| | |
|---|---|
| Column volume | 12mL/60mL |
| Pore size of frit | 10 μm |
| pH stability | 1-14 |
| Chemical stability | Stable in common aqueous solutions |

### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| WelCot 10 empty column | 00057-00001 | 1-12mL |  |
| WelCot 60 empty column | 00057-00002 | 1-60mL | |
| | | | |

## PRECOT EMPTY COLUMN

PreCott empty columns are available in two specifications, 1ml and 5ml. Columns are made of bio-resistant polypropylene. The upper and lower frits are composed of porous polyethylene. The column is equipped with 1/16 port and can be used with syringe, pump and AKTA system.





### Technical parameters

| | |
|---|---|
| Composition | One upper and one lower cover, tube, two frits |
| Frit material | Polyethylene |
| Tube material | Polypropylene |

| | |
|---|---|
| Column volume | 1mL/5mL |
| Pore size of frit | 10 μm |
| pH stability | 1-14 |
| Chemical stability | Stable in common aqueous solutions |

### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| PreCot 1 ml empty column | 00055-0001 | 1mL |  |
| PreCot 5 ml empty column | 00055-0001 | 5mL | |
| | | | |

## TXK EMPTY COLUMN FOR LABORATORY

Laboratory-type empty columns use glass column with diameter from 1.6 cm to 5 cm, length from 20 cm to 100 cm, and packing media from 3 ml-2 L.

### Features

* Jacket can maintain certain operating temperature
* Good chemical resistance
* Specific column packer guarantees good column efficiency
* Quick-locked adapter ensures average flow rate

### Technical parameters

| Product | Diameter (mm) | Height(cm) | Packing volume | Operating pressure | Temperature | Mesh size |
|---|---|---|---|---|---|---|
| TXK16/20 | 16 | 20 | 5-35mL | ≦5bar | 4-60 C | 10μm |
| TXK16/40 | 16 | 40 | 45-75mL | ≦5bar | | |
| TXK16/70 | 16 | 70 | 105-135mL | ≦5bar | | |
| TXK16/100 | 16 | 100 | 165-190mL | ≦5bar | | |
| TXK26/20 | 26 | 20 | 5-90mL | ≦5bar | | |
| TXK26/40 | 26 | 40 | 115-190mL | ≦5bar | | |
| TXK26/70 | 26 | 70 | 265-340mL | ≦5bar | | |
| TXK26/100 | 26 | 100 | 415-450mL | ≦5bar | | |
| TXK50/20 | 50 | 20 | 5-350mL | ≦3bar | | |
| TXK50/30 | 50 | 30 | 270-550mL | ≦3bar | | |
| TXK50/70 | 50 | 70 | 1020-1300mL | ≦3bar | | |
| TXK50/100 | 50 | 100 | 1650-1950mL | ≦3bar | | |

### Ordering information

| Product | P/N | Specification | Product | P/N | Specification | Picture |
|---|---|---|---|---|---|---|
| TXK16/20 | 00055-00020 | TXK26/70 | 16 Packing equipment | 00055-00026 | 00055-00037 |  |
| TXK16/40 | 00055-00021 | TXK26/100 | 26 Packing equipment | 00055-00027 | 00055-00038 | |
| TXK16/70 | 00055-00022 | TXK50/20 | 50 Packing equipment | 00055-00028 | 00055-00039 | |
| TXK16/100 | 00055-00023 | TXK50/30 | 16 Piston head | 00055-00029 | 00055-00040 | |
| TXK26/20 | 00055-00024 | TXK50/70 | 26 Piston head | 00055-00030 | 00055-00041 | |
| TXK26/40 | 00055-00025 | TXK50/100 | 50 Piston head | 00055-00031 | 00055-00042 | |

## TXK EMPTY COLUMN FOR PRODUCTION

TXK series manual chromatography column has a simple way to pack with less tools, and can provide a fast packing method for a variety of chromatography packing materials, which is conducive to saving time and reducing the operator's work intensity with accurate and highly repeatable loading effect.

### Features

* The column steel structure of the column is made of 316L stainless steel
* Column glass adopts high-precision medical glass
* Upper and lower frits are resistant to various acid and alkali solutions and organic solvents
* O-ring has better sealing effect and is more durable
* With adaptor for adjusting bed height
* Chromatography columns with different specifications are available for customers.

### Technical parameters

| Product | Diameter (mm) | Height(cm) | Packing volume | Max. pressure (bar) | Temperature |
|---|---|---|---|---|---|
| TXK100/500 | 100 | 50 | 0.5-3 L | 8 | 4-60℃ |
| TXK100/750 | 100 | 75 | 2-5 L | 8 | |
| TXK100/950 | 100 | 95 | 4-7 L | 8 | |
| TXK140/500 | 140 | 50 | 0.5-6 L | 6 | |
| TXK140/750 | 140 | 75 | 4-10 L | 6 | |
| TXK140/950 | 140 | 95 | 7-13 L | 6 | |
| TXK200/500 | 200 | 50 | 1-13 L | 6 | |
| TXK200/750 | 200 | 75 | 8-20 L | 6 | |
| TXK200/950 | 200 | 95 | 15-28 L | 6 | |
| TXK300/500 | 296 | 50 | 2-27 L | 4 | |
| TXK300/750 | 296 | 75 | 19-45 L | 4 | |
| TXK300/950 | 296 | 95 | 32-58 L | 4 | |
| TXK450/500 | 446 | 50 | 5-65 L | 2.5 | |
| TXK450/750 | 446 | 75 | 35-90 L | 2.5 | |
| TXK450/950 | 446 | 95 | 74-130 L | 2.5 | |





### Ordering information

| Product | P/N | Product | P/N | Picture |
|---|---|---|---|---|
| TXK100/500 | 00055-00050 | TXK200/950 | 00055-00058 |  |
| TXK100/750 | 00055-00051 | TXK300/500 | 00055-00059 | |
| TXK100/950 | 00055-00052 | TXK300/750 | 00055-00060 | |
| TXK140/500 | 00055-00053 | TXK300/950 | 00055-00061 | |
| TXK140/750 | 00055-00054 | TXK450/500 | 00055-00062 | |
| TXK140/950 | 00055-00055 | TXK450/750 | 00055-00063 | |
| TXK200/500 | 00055-00056 | TXK450/950 | 00055-00064 | |
| TXK200/750 | 00055-00057 | | | |

## GEL FILTRATION PREPACKED COLUMNS

### G series

Desalting prepacked columns are often used for buffer exchange, desalting, removal of small molecules, and small amount of sample preparation for biological samples.

*Filling medium: Tandex G25F and Tandex G25M

*Loading volume: up to 30% column volume for one-time loading

*Fast desalting, buffer replacement, separation of biomolecules.

### Technical parameters

| | BC-10 desalting column | PreCot G25F | PreLoad Desalting Columns | |
|---|---|---|---|---|
| | | | PreLoad 16/10 Desalting Column | PreLoad 26/10 Desalting Column |
| Column bed volume ml | 8.3 | 5 | 19-21 | 50-56 |
| Inner diameter*column bed height mm | 14.5*50 | 16*25 | 16*100(±5) | 26*100(±5) |
| Medium | Tandex G25F (particle size can be changed according to customer needs) | | | |
| Maximum sample volume | 2mL | 1.3mL | 5mL | 13mL |
| Molecular Exclusion Range (Da) | Globulin 5000 | | | |
| Suggested flow rate(cm/h) | Gravity flow | ＜150 | ＜300 | ＜300 |
| Maximum back pressure (MPa) | | 0.3 | 0.3 | 0.3 |
| Chemical stability | Temperature in all common buffers | | | |
| pH stability | 2-13 long term | | | |

### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| PreCot G-25 Fine，5mL | 00051-33012 | 1Pcs |  |
| PreCot G-25 Medium，5mL | 00051-32012 | 1Pcs | |
| BC-10 Desalting Column, 8.3mL | 00051-32022 | 1Pcs | |
| BC-10 Desalting Column, 8.3mL | 00051-32023 | 10Pcs | |
| PreLoad 16/10 Desalting Column | 00051-32020 | 1Pcs | |
| PreLoad 26/10 Desalting Column | 00051-32021 | 1Pcs | |

## SUPERTANDEX PREP GRADE SERIES

*PreLoad prepacked column is filled with filler in TXK chromatography column tube, which is used for the rapid preparation and purification of proteins, DNA fragments and small molecules. It has the advantages of high flow rate, high resolution, stable physical and chemical properties, and easy scale-up.

*SuperTandex30 prep grade: polypeptides, small biomolecules

*SuperTandex75 prep grade: recombinant protein, cytochrome

*SuperTandex200 prep grade: monoclonal antibody, macromolecular protein

### Technical parameters

| Product | PreLoad 16/60 SuperTandex 30pg | PreLoad 26/60 SuperTandex 30pg | PreLoad 16/60 SuperTandex 75pg | PreLoad 26/60 SuperTandex 75pg | PreLoad 16/60 SuperTandex 200pg | PreLoad 26/60 SuperTandex 200pg |
|---|---|---|---|---|---|---|
| Preloaded media | SuperTandex 30pg | | SuperTandex 75pg | | SuperTandex 200pg | |
| Separation range (Da) | ＜10000 | | 3000-70000 | | 10000-600000 | |
| Average particle size (μm) | 34μm | | | | | |
| Column bed height (±2cm) | 60 | 60 | 60 | 60 | 60 | 60 |
| Pressure(Mpa) | 0.3 | | | | | |
| Recommended flow rate (ml/min) | 0.5-1.5 | 2-4 | 0.5-1.5 | 2-4 | 0.5-1.5 | 2-4 |
| Preservation solution | 20% ethanol | | | | | |
| Chemical stability | All common water-soluble buffers, 1M NaOH, 8M urea, 6M HCl, 70% ethanol | | | | | |
| pH stability | 3-12 long term, 2-14 short term | | | | | |





### Ordering information

| Product | P/N | Specification | Picture |
|---|---|---|---|
| PreLoad 16/60 SuperTandex 30pg | 00055-10020 | 1Pcs |  |
| PreLoad 26/60 SuperTandex 30pg | 00055-10021 | 1Pcs | |
| PreLoad 16/60 SuperTandex 75pg | 00055-20020 | 1Pcs | |
| PreLoad 26/60 SuperTandex 75pg | 00055-20021 | 1Pcs | |
| PreLoad 16/60 SuperTandex 200pg | 00055-30020 | 1Pcs | |
| PreLoad 26/60 SuperTandex 200pg | 00055-30021 | 1Pcs | |

## HYDROPHOBIC CHROMATOGRAPHY PREPACKED COLUMN

*PreCot hydrophobic interaction chromatography prepacked column is used for the purification of a small amount of samples. In addition to being used in conjunction with the chromatography system, it can also be equipped with a syringe loading connector and use a syringe for simple purification.

*Packing medium: hydrophobic interaction chromatography medium

### Technical parameters

| | | PreCot Series | PreCot Series | PreCot 16/10 Series | PreCot 26/10Series |
|---|---|---|---|---|---|
| Column volume (mL) | | 1 | 5 | 20 | 50 |
| Internal diameter and bed height (mm) | | 7*25 | 16*25 | 16*100 | 26*100 |
| Recommended flow rate (mlL/min) | 6FF framework | 0.2-2 | 1-10 | 2.0-10.0 | 5.0-26.5 |
| | 4FF framework | 0.2-2.0 | 1-10 | 3-6 | 7-16 |
| | HP framework | 0.2-1.0 | 0.7-4.0 | 2.0-5.0 | 4.0-11.0 |
| Maximum pressure the column bed can withstand during operation (MPa) | | FF, HP base frame 0.3MP (3bar) | | | |

### Ordering information

| Product | P/N | Specification | Product | P/N | Specification | Picture |
|---|---|---|---|---|---|---|
| PreCot Phenyl 6FF (NTA) | 00071-41020 | 1mL/Pcs | PreCot Butyl 6HP | 00071-23020 | 1mL/Pcs |  |
| | 00071-41021 | 5mL/Pcs | | 00071-23021 | 5mL/Pcs | |
| PreCot Phenyl 6FF(HS) | 00071-42020 | 1mL/Pcs | PreCot Octyl 6HP | 00071-33020 | 1mL/Pcs | |
| | 00071-42021 | 5mL/Pcs | | 00071-33021 | 5mL/Pcs | |
| PreCot Phenyl 6HP | 00071-43020 | 1mL/Pcs | PreCot Butyl 4FF | 00071-24020 | 1mL/Pcs | |
| | 00071-43021 | 5mL/Pcs | | 00071-24021 | 5mL/Pcs | |
| PreCot Butyl-S 6FF | 00071-14020 | 1mL/Pcs | PreCot Octyl 4FF | 00071-34020 | 1mL/Pcs | |
| | 00071-14021 | 5mL/Pcs | | 00071-34021 | 5mL/Pcs | |

# ION EXCHANGE CHROMATOGRAPHY PRE-PACKED COLUMNS

*PreCot ion exchange chromatography pre-packed columns are used for medium screening, purification condition exploration, and purification of small sample volumes. In addition to being used with chromatography systems, they can also be used with injection ports to perform simple purifications using an injector.

*PreLoad ion exchange chromatography pre-packed columns can be used for separation and preparation of small-scale samples in laboratory and pilot-scale experiments.

*Packing media: ion exchange chromatography media.

## Technical parameters

| | | PreCot Series | PreCot Series | PreCot 16/10 Series | PreCot 26/10Series |
|---|---|---|---|---|---|
| Column volume (mL) | | 1 | 5 | 20 | 50 |
| Internal diameter and bed height (mm) | | 7*25 | 16*25 | 16*100 | 26*100 |
| Recommended flow rate (mlL/min) | FF framework | 0.2-2 | 1-10 | 2.0-10.0 | 5.0-26.5 |
| | HP framework | 0.2-1.0 | 0.7-4.0 | 2.0-5.0 | 4.0-11.0 |
| Maximum pressure the column bed can withstand during operation (MPa) | | FF、HP framework 0.3MP(3bar) Solid、Mustang framework 0.5Mpa(5ba) | | | |

## Ordering information

| Product | P/N | Specification | Product | P/N | Specification | Picture |
|---|---|---|---|---|---|---|
| PreCot SP 6FF | 00062-33011 | 1mL/Pcs | PreCot Q 6FF | 00071-23020 | 1mL/Pcs |  |
| | 00062-33012 | 5mL/Pcs | | 00071-23021 | 5mL/Pcs | |
| PreCot SP 6BB | 00062-34011 | 1mL/Pcs | PreCot Q 6HP | 00071-33020 | 1mL/Pcs | |
| | 00062-34012 | 5mL/Pcs | | 00071-33021 | 5mL/Pcs | |
| PreCot SP 6HP | 00062-32011 | 1mL/Pcs | PreCot Q 6XL | 00071-24020 | 1mL/Pcs | |
| | 00062-32012 | 5mL/Pcs | | 00071-24021 | 5mL/Pcs | |
| PreCot SP 6XL | 00062-31011 | 1mL/Pcs | PreCot CM C-25 | 00071-34020 | 1mL/Pcs | |
| | 00062-31012 | 5mL/Pcs | | 00071-34021 | 5mL/Pcs | |
| PreCot CM 6FF | 00062-53011 | 1mL/Pcs | PreCot DEAE 6FF | 00062-13011 | 1mL/Pcs | |
| | 00062-53012 | 5mL/Pcs | | 00062-13012 | 5mL/Pcs | |
| PreCot Q 6BB | 00062-24011 | 1mL/Pcs | | | | |
| | 00062-24012 | 5mL/Pcs | | | | |
| PreLoad 16/10 DEAE FF | 00062-13020 | 1Pcs | PreLoad 16/10 CM FF | 00062-53020 | 1Pcs | |
| PreLoad 26/10 DEAE FF | 00062-13021 | 1Pcs | PreLoad 26/10 CM FF | 00062-53021 | 1Pcs | |
| PreLoad 26/50 SP FF | 00062-33020 | 1Pcs | PreLoad 16/10 SP FF | 00062-33022 | 1Pcs | |
| PreLoad 26/10 SP FF | 00062-33021 | 1Pcs | | | | |





# AFFINITY CHROMATOGRAPHY PREPACKED COLUMNS

*PreCot affinity chromatography prepacked column is used for the purification of a small amount of samples. In addition to being used in conjunction with the chromatography system, it can also be equipped with a syringe for simple purification using a syringe.

*Loading medium: affinity chromatography medium.

## Ordering information

| Product | P/N | Specification | Product | P/N | Specification |
|---|---|---|---|---|---|
| PreCot NHS 4FF | 00081-00111 | 1mL/Pcs | PreCot GST 4FF | 00081-10011 | 1mL/Pcs |
| | 00081-00112 | 5mL/Pcs | | 00081-10012 | 5mL/Pcs |
| PreCot Ni 6FF(IDA) | 00082-06011 | 1mL/Pcs | PreCot Benzamidine 4FF(HS) | 00081-11011 | 1mL/Pcs |
| | 00082-06012 | 5mL/Pcs | | 00081-11012 | 5mL/Pcs |
| PreCot Chelating 6FF | 00082-02011 | 1mL/Pcs | PreCot Endotoxin rem 4FF | 00081-16011 | 1mL/Pcs |
| | 00082-02012 | 5mL/Pcs | | 00081-16012 | 5mL/Pcs |
| PreCot Ni 6FF(NTA) | 00082-03011 | 1mL/Pcs | PreCot Ni 6HP (NTA) | 00082-09011 | 1mL/Pcs |
| | 00082-03012 | 5mL/Pcs | | 00082-09012 | 5mL/Pcs |
| PreCot IMAC 6FF | 00082-01011 | 1mL/Pcs | PreCot Co 6FF（NTA） | 00082-07011 | 1mL/Pcs |
| | 00082-01012 | 5mL/Pcs | | 00082-07012 | 5mL/Pcs |
| PreCot Heparin FF | 00082-18011 | 1mL/Pcs | Pre-packed gravity column Ni-NTA | 00082-03031 | 5mL/Pcs |
| | 00082-18012 | 5mL/Pcs | Pre-packed gravity column Co-NTA | 00082-07031 | 5mL/Pcs |
| PreCot Protein G 4FF | 00081-12011 | 1mL/Pcs | Pre-packed gravity column Ni-IDA | 00082-06031 | 5mL/Pcs |
| | 00081-12012 | 5mL/Pcs | PreCot Protein G HP,1mL | 00082-19011 | 1mL/Pcs |
| PreCot Protein G HP,1mL | 00082-19013 | 5Pcs/Box | | | |

# GUIDELINES FOR PROTEIN PURIFICATION

For protein purification, the inherent similarities and differences between various proteins should be applied to remove non-protein contamination and purify the target protein from other proteins. Each protein has differences in size, shape, charge, hydrophobicity, solubility, and biological activity. These differences can be used to extract proteins from mixtures such as E. coli lysates to obtain recombinant proteins.

# BASIC STRATEGIES FOR PROTEIN PURIFICATION

## 1. Coarse extraction

Rudimentary purification of target protein from samples

Purpose: to rapidly concentrate (reduce volume) and stabilize the sample (remove protease).

Commonly used chromatography techniques: affinity, ion exchange, or hydrophobic chromatography.

**Recommended products:**

Tanrose BB series are available for complex pre-treatment of strong viscous samples.

Tanrose XL series media can be selected for the samples with high capacity.

Different specifications of pre-packed columns of all above media can be provided to the customer for facilitating the screening of coarse extraction conditions.

## 2. Moderate purification

Remove most impurities

Purpose: to concentrate and further purify

Commonly used chromatography techniques: affinity, ion or hydrophobic chromatography

**Recommended products:**

HP series Ion-exchange or hydrophobic media PreCot series prepacked column can be used for condition optimization.

## 3. Fine purification

Remove residual impurities

Purpose: to obtain the expected purity.

Commonly used chromatography techniques: affinity chromatography, gel filtration, ion exchange, hydrophobic chromatography and reversed chromatography.

**Recommended products:**

SuperTandex 75 pg or SuperTandex 200 pg are available for gel filtration. Ion-exchange and hydrophobic chromatography are generally based on high performance media, or we can customize products with smaller and more uniform beads.





# THE CHROMATOGRAPHIC COLUMN PACKING PROCESS

## 1. Packing material and packing solution

**Empty chromatography column:** TXK16/20 or TXK26/20

**Column packing equipment:** medium pressure chromatography system

**Packing solution:** 01M NaCI buffer

**Note:** The materials and solutions used should be consistent with the temperature of the chromatography operation:

**Chromatographic column screen pore size:** 23μm for Fast Flow series media; 10μm for High Performance series media;

**Preparation of gel medium:** accurately calculate the amount of medium required (this is especially important for chromatography columns with fixed column heights), and the amount of sedimentation medium required for L chromatography columns after filling is about 1.15L. use more than5 times the volume of column packing buffer to wash away the preservation solution, after the medium is cleaned, add an equal volume of column packing buffer for later use.

**Note:** Sedimentation medium: keep it still for more than one day, pour off the medium of the upper layer of preservation solution.

## 2. Column installation:

2.1. Check the chromatography column to ensure that all parts are complete and clean. After installing the lower column head and tightening the O-ring, fix the chromatography column vertically on the iron stand, and use a spirit level to check and adjust the well to keep the chromatography column horizontal.

2.2 Install the column packer on the top of the chromatography column.

2.3 Add an appropriate amount of packing solution to the chromatography column, and open the lower port for gravity flow to remove the air in the screen. Keep 1-2cm of solution in the column, and close the outlet at the lower end of the chromatography column.

## 3. Packing process

3.1 Drainage with a glass rod close to the inner wall of the column, and pour the gel suspension into the chromatography column continuously to reduce the generation of air bubbles. Quickly fill the column packer with column packing solution, and install the upper cover of the column packer (the bubbles in the column packer pipeline have been drained with column packing buffer)

3.2 Turn on the system pump, press the column with a flow rate of 30cm/h, and stop the first step of column pressing until the column bed interface is stable.

3.3 Seal the lower port, open the packing device, use the siphon method to remove the liquid in the packing device, remove the packing device, and seal the remaining space of the chromatography column with packing buffer.

3.4 Connect the upper column head to the low-pressure chromatography system, turn on the pump to discharge the residual air in the pipeline at a certain flow rate, stop the system, install the upper column head on the chromatography column, open the lower port, and the upper column head screen is about 0.5 away from the rubber surface -1cm, tighten the sealing ring, turn on the pump and press the column for more than 3CV at 70% of the maximum flow rate, until the volume of the column bed does not change, and mark the interface.

3.5 Turn off the system pump, block the outlet at the lower end, disconnect the upper end of the chromatography column from the pump, press down the adjusting rod until it stops at 0-0.5cm below the mark, block the upper port, and the column loading is completed.

Note: Conversion relationship between linear flow rate and volumetric flow rate

Linear flow rate (cm/h) = volumetric flow rate (mL/mi) x60/cross-sectional area ($cm^2$)

## Chromatographic column efficiency detection

In order to check the packing quality, the column efficiency should be tested immediately after the packing is completed. The performance of the packed D column is usually measured by terms such as the number of theoretical plates per meter N/m and the peak asymmetry factor As. The higher the column efficiency, the stronger the separation ability. For Tanrose Fast Flow medium (average particle size 90um), the column efficiency is better when N/m is 3000. The acceptable range of As is 0.8-1.5. For Tanrose High Performance media (average particle size 34um), N/m should be >10000. The acceptable range of As is 0.8-1.8. The Zeng path used for column efficiency detection should be as short as possible, and the inner diameter should be kept to a minimum so as not to cause excessive stress.

### Detection conditions

| Sample | 1% acetone aqueous solution | 0.8M-1M NaCl aqueous solution |
|---|---|---|
| Sample volume | 1% column volume | 1% column volume |
| Buffer | Water | 0.1M-0.15M Nadl aqueous solution |
| Flow rate | 20-30cm/h | 20-30cm/h |
| Detection | UV280nm | Conductivity |