

YMC Glass Columns

For Laboratory
Scale Applications



Biocompatible

Self-packing

Easy Handling

YMC Glass Columns

Biochromatography is widely used for high-performance downstream processing techniques for a wide range of compounds, including proteins, peptides or nucleic acids. When using various chromatographic techniques

such as ion exchange, affinity or gel permeation chromatography, high-performance separation media are increasingly used and, as a result, higher demands are made on the quality of the column hardware.

Laboratory Scale:

ECO and ECO^{PLUS} Glass Columns

ECO columns are glass columns for use with almost all types of soft gels and medium pressure liquid chromatography applications. A heating/cooling jacket option can be supplied on request.

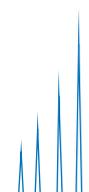
ECO^{PLUS} columns meet the highest criteria for professional laboratory use. Particular attention has been paid to the column volume ranges and the pressure resistance, so that high flow rates, performance and efficiency can be achieved.

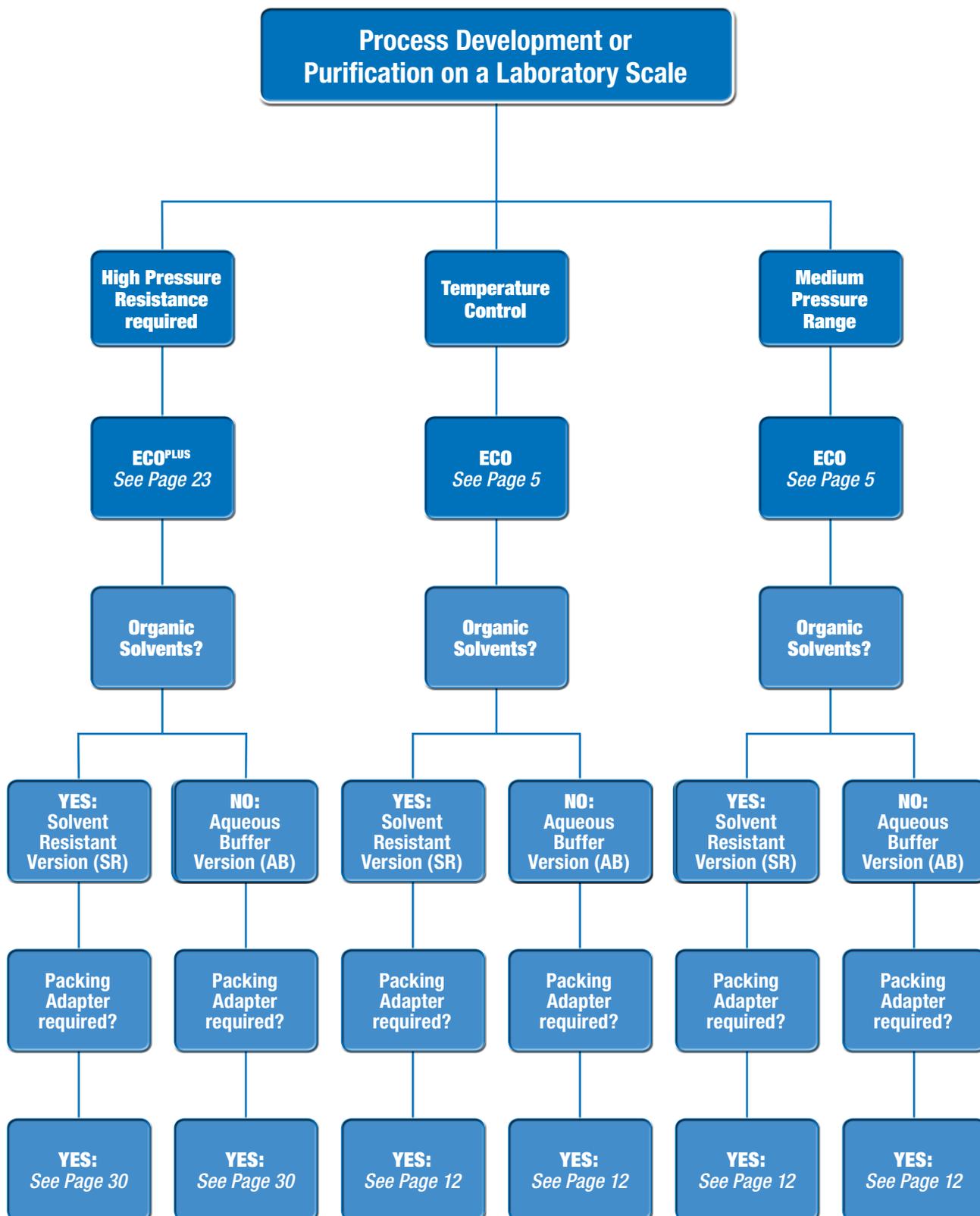


Contents

page

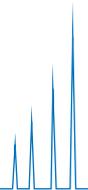
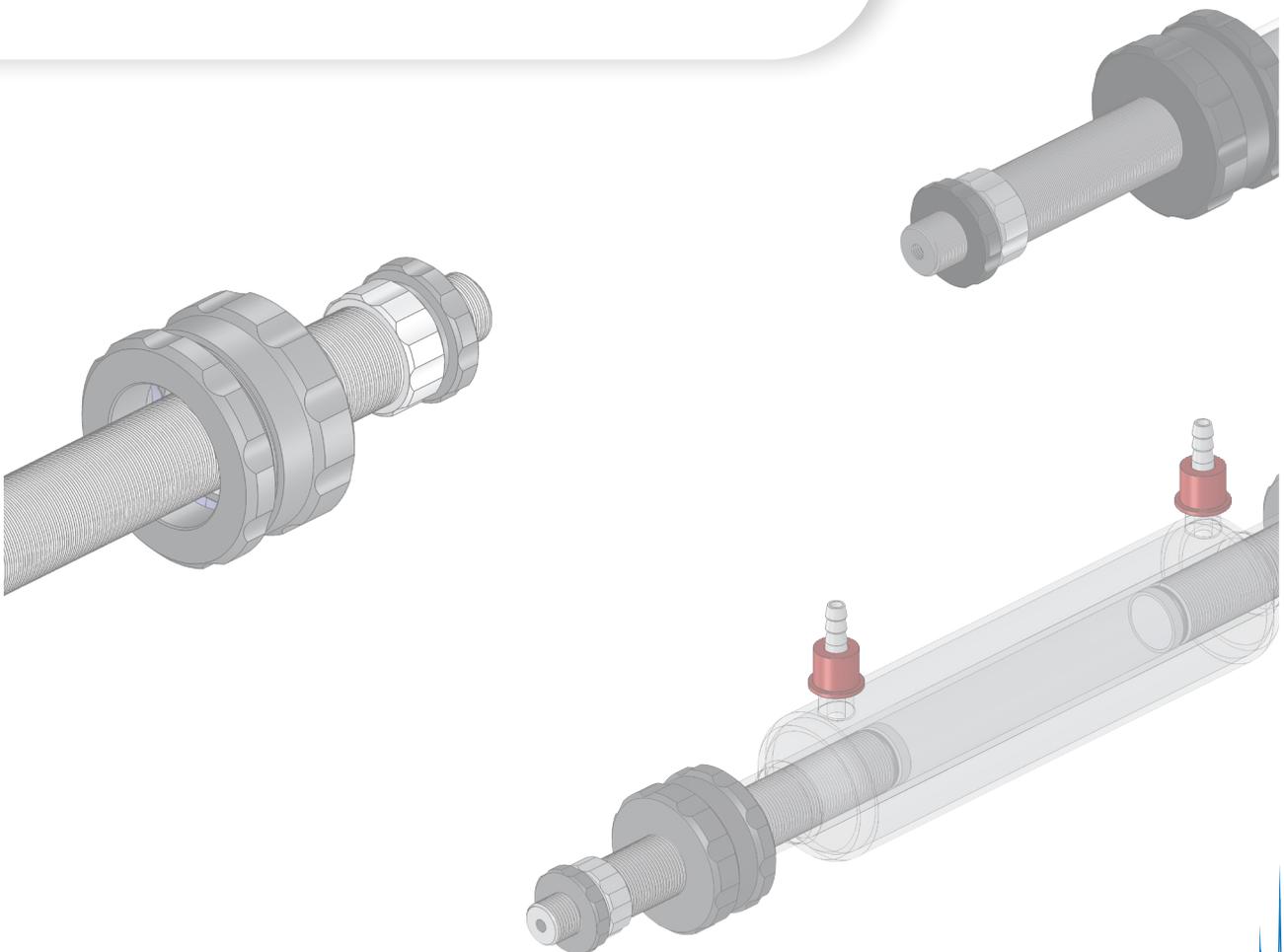
| | |
|--|--------------|
| Selection Guide | 4 |
| Glass columns for analytical and preparative MPLC applications: ECO | 5–17 |
| Specifications..... | 8–9 |
| Chemical Resistance..... | 10–11 |
| Packing Adapters..... | 12–13 |
| Ordering Guide..... | 14–15 |
| Accessories and Spare Parts..... | 16–17 |
| ECO and ECO^{PLUS} Glass Column Accessories | 18–19 |
| Column Version Overview | 20–21 |
| Glass columns for high pressure applications: ECO^{PLUS} | 23–35 |
| Specifications..... | 26–27 |
| Chemical Resistance..... | 28–29 |
| Packing Adapters..... | 30–31 |
| Accessories and Spare Parts..... | 32–33 |
| Ordering Guide..... | 34–35 |
| Training and Seminars | 36 |
| Laboratory Services | 37 |
| Also of interest | 38 |
| Questionnaire for YMC Glass Columns | 39 |







ECO Glass Columns



ECO Glass Columns

- **First choice for medium pressure liquid chromatography (MPLC)**
- **Pressure limit 5–30 bar**
- **Heating/cooling jacket available**
- **70 and 80 mm ID columns with column stands available**

- Compatible with any LC system
- For all types of silica and soft gels
- Aqueous buffers and solvents
- Temperature range 4–40°C
- Easy self-packing

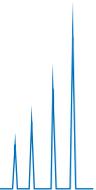
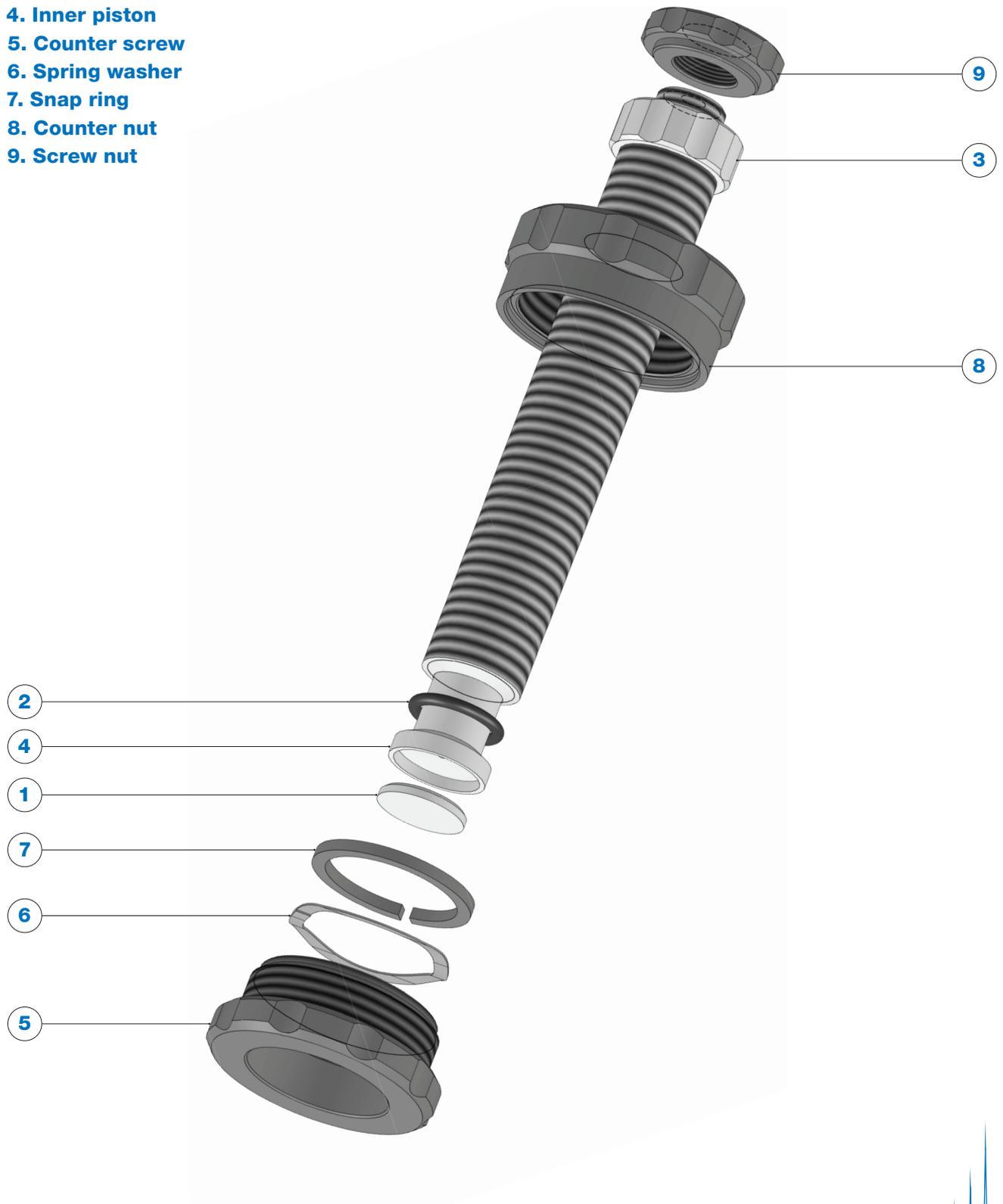
ECO columns are glass columns suitable for all types of soft gel and medium pressure (pressure limit 5 – 30 bar) liquid chromatography applications. With a choice of one or two adjustable length pistons, they are available in two versions: **AB (aqueous buffer)** for use with aqueous buffers and cold room applications and **SR (solvent resistant)** for all forms of normal and reversed phase chromatography.

ECO columns are produced using high-precision CNC manufacturing. They are competitively priced and equipped with a screw-lock system which makes it possible to open and seal the column simply and quickly.

Each column passes a quality control pressure test. A water-jacketed option can be supplied on request.

Drawing of Variable Colum End Piece – ECO

- 1. Frit
- 2. O-ring
- 3. External piston
- 4. Inner piston
- 5. Counter screw
- 6. Spring washer
- 7. Snap ring
- 8. Counter nut
- 9. Screw nut



Specifications

| Parameter | Standard Columns |
|------------------------|-------------------------|
| Inner diameters [mm] | 10, 15, 25, 50, 70, 80 |
| Bed lengths [mm] | 12, 200, 450, 750, 1000 |
| Pressure range* [bar] | 30–5 |
| Temperature range [°C] | 4–40 |

| | |
|-------------------------|------------------------------------|
| Versions | AB (Aqueous Buffer) |
| | SR (Solvent Resistant) |
| Combinations of pistons | Two adjustable pistons: Multivario |
| | One adjustable piston: Vario |

| | |
|---|--|
| Wetted parts | AB: POM pistons, glass or PE frits, Viton or EPDM O-ring, borosilicate glass body |
| | SR: PVDF pistons, glass or stainless steel frits, Kalrez® O-ring, borosilicate glass body |
| Connections | The columns are supplied with different adapters to allow direct connection to any LC-system (e.g. ÄKTA system) |
| Accessories supplied for columns with ID 10–15 mm | 1 x frit removal tool 2 x plugs, PTFE (1/4"-28G) 1 x 1 m FEP tubing (0.8 x 1.6 mm) 4 x 1/4"-28G nut and ferrule for 1/16" tubing (collapsible) 2 x M6 nut and ferrule for 1/16" tubing 2 x 10-32 nut and ferrule for 1/16" tubing 2 x anti-kink tube protector |
| Accessories supplied for columns with ID 25–80 mm | 1 x frit removal tool 2 x plugs, PTFE (1/4"-28G) 1 x 1 m FEP tubing (1.6 or 2.4 x 3.2 mm) 4 x 1/4"-28G nut and ferrule for 1/8" tubing (collapsible) 2 x M6 nut and ferrule for 1/8" tubing |

*Pressure limit depends on inner diameter.

Specifications

**Your benefit of Multivario option:
Greater flexibility due to
expanded bed length and
column volume ranges!**

What is the difference between Vario and Multivario options?

Adjustable and non-adjustable (fixed) pistons are available for the ECO columns.

Two different options are available for combining these two pistons:

- 1. Vario: One adjustable and one fixed piston**
- 2. Multivario: Two adjustable pistons**

The selection of the option depends on the required ranges of bed lengths and column volumes.

| Inner diameter column (mm) | Pressure limit (bar) | One adjustable piston (Vario) | | Two adjustable pistons (Multivario) | |
|----------------------------|----------------------|-------------------------------|--------------------------|-------------------------------------|--------------------------|
| | | Bed length range (mm) | Column volume range (mL) | Bed length range (mm) | Column volume range (mL) |
| 10 | 30 | 0-120 | 0-9.4 | 0-120 | 0-9.4 |
| | | 80-200 | 6.3-16 | 0-200 | 0-16 |
| | | 330-450 | 26-35 | 210-450 | 17-35 |
| | | 630-750 | 50-59 | 510-750 | 40-59 |
| | | 880-1000 | 69-79 | 760-1000 | 60-79 |
| 15 | 25 | 0-120 | 0-21 | 0-120 | 0-21 |
| | | 80-200 | 14-35 | 0-200 | 0-35 |
| | | 330-450 | 58-80 | 210-450 | 37-80 |
| | | 630-750 | 111-133 | 510-750 | 90-133 |
| | | 880-1000 | 156-177 | 760-1000 | 134-177 |
| 25 | 15 | 0-120 | 0-59 | 0-120 | 0-59 |
| | | 80-200 | 39-98 | 0-200 | 0-98 |
| | | 330-450 | 162-221 | 210-450 | 103-221 |
| | | 630-750 | 309-368 | 510-750 | 250-368 |
| | | 880-1000 | 432-491 | 760-1000 | 373-491 |
| 50 | 10 | 0-120 | 0-236 | 0-120 | 0-236 |
| | | 80-200 | 157-393 | 0-200 | 0-393 |
| | | 330-450 | 648-884 | 210-450 | 412-884 |
| | | 630-750 | 1237-1473 | 510-750 | 1001-1473 |
| | | 880-1000 | 1728-1964 | 760-1000 | 1492-1964 |
| 70 | 5 | | | 0-120 | 0-462 |
| | | | | 0-200 | 0-770 |
| | | | | 90-450 | 356-1732 |
| | | | | 390-750 | 1501-2886 |
| | | | | 640-1000 | 2463-3848 |
| 80 | 5 | | | 0-120 | 0-603 |
| | | | | 0-200 | 0-1005 |
| | | | | 90-450 | 452-2262 |
| | | | | 390-750 | 1960-3770 |
| | | | | 640-1000 | 3217-5026 |

Chemical resistance

On the following two pages, the chemical resistances (standard conditions) for the available standard versions are listed.

ECO – AB version

| Solvent | Columns with 10–15 mm ID POM piston, Viton O-ring and glass frit | Columns with 70–80 mm ID POM piston, EPDM O-ring and PE frit |
|-------------------------------|--|--|
| Acetone | Not resistant | Resistant |
| Acetonitrile | Not resistant | Not resistant |
| Ammonium dihydrogen phosphate | Limited resistant | Resistant |
| Cyclohexane | Resistant | Not resistant |
| Dichloromethane | Limited resistant | Not resistant |
| EDTA | Resistant | Not resistant |
| Acetic acid (5 %) | Resistant | Resistant |
| Ethanol | Resistant | Resistant |
| Ethyl acetate | Not resistant | Limited resistant |
| n-hexane | Resistant | Not resistant |
| Isopropanol | Resistant | Resistant |
| Methanol | Limited resistant | Resistant |
| NaOH (1 M) | Limited resistant | Resistant |
| HCl (1 M) | Not resistant | Not resistant |

Not resistant

Limited resistant

Resistant

Chemical resistance

ECO – SR version

| Solvent | Columns with 10–15 mm ID PVDF piston, Kalrez O-ring and glass frit | Columns with 70–80 mm ID PVDF piston, Kalrez O-ring and stainless steel frit |
|-------------------------------|--|--|
| Acetone | Not resistant | Not resistant |
| Acetonitrile | Limited resistant | Limited resistant |
| Ammonium dihydrogen phosphate | Resistant | Resistant |
| Cyclohexane | Resistant | Resistant |
| Dichloromethane | Resistant | Resistant |
| EDTA | Resistant | Resistant |
| Acetic acid (5 %) | Resistant | Resistant |
| Ethanol | Resistant | Resistant |
| Ethyl acetate | Resistant | Resistant |
| n-hexane | Resistant | Resistant |
| Isopropanol | Resistant | Resistant |
| Methanol | Resistant | Resistant |
| NaOH (1 M) | Resistant | Resistant |
| HCl (1 M) | Resistant | Not resistant |

Not resistant

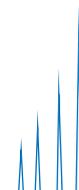
Limited resistant

Resistant

If your solvent is not listed, please contact us for chemical resistance check.

Note: The resistance of the standard versions is based on the resistance of the each wetted part. If one part is limited or not resistant, the whole column is marked with this characteristic as it is the critical part thereof.

For all columns, where the combination of the wetted parts varies from the above listed ones, the chemical resistance can vary, too. Therefore, please contact us if you need assistance regarding the chemical resistance.



Packing Adapters

For more information on column packing download the ECO manual or visit one of our seminars!

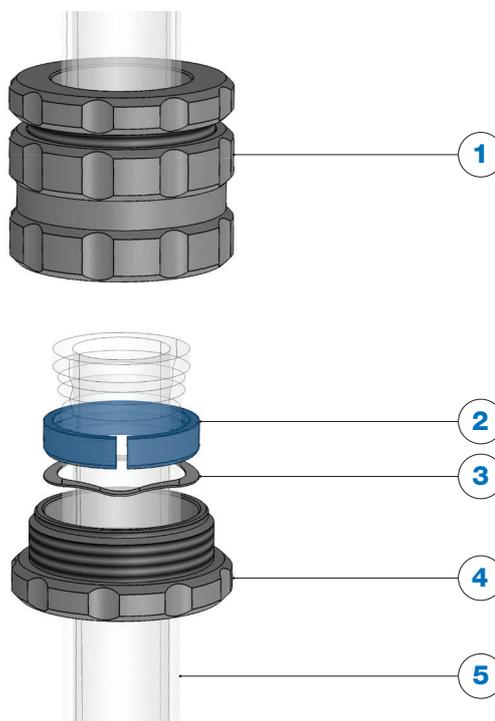
Do I need a packing adapter?

Packing adapters are used if the packing method requires additional column volume during the packing process.

More volume than given by the column alone may be required when the column is packed with the slurry method. A suspension of material and packing sol-

vent in a concentration of approximately 30 - 50% is used, depending on the packing material. The additional packing solvent above the finished column bed will be removed later but during the packing process the packing adapter gives the additional volume which is required for this method.

1. Coupling unit
2. Snap ring
3. Spring washer
4. Counter screw
5. Glass body



What are the components of the packing adapter?

The ECO series packing adapters consist of a column coupler and an empty glass body. These must be of the same diameter as the column to be packed and must be used as packing adapters, not

for extending the length of a column body during use. The product manual supplied with each column contains detailed examples of dry packing and slurry packing techniques.

How to install the packing adapter?

1. Remove the upper end piece from the column body.
2. Put the counter screw of the coupling unit on the column body.
Take care that just the blue column coupler snap ring is included.
3. Install the end piece on top of the glass body of the packing adapter.

Packing Adapters

One of our lab services is glass column packing with your choice of material.

How to order a packing adapter?

1. Select the correct column coupler

| | Inner diameter column | Identification for coupling unit | O-ring |
|-----------------------|-----------------------|----------------------------------|---|
| Combinations | ECO10 (10 mm ID) | KU/ | V-3 Viton (AB, 10–50 mm ID) |
| | ECO15 (15 mm ID) | | V EPDM (AB, 70–80 mm ID) |
| | ECO25 (25 mm ID) | | K-3 Kalrez® (SR, 10–50 mm ID) |
| | ECO50 (50 mm ID) | | |
| | ECO70 (70 mm ID) | | |
| | ECO80 (80 mm ID) | | |
| Example | ECO10 | KU/ | V-3 |
| Inner diameter column | 10 mm | | |
| O-ring | | | 10 mm ID column, AB version, Viton O-ring |

2. Select the correct glass body

Glass bodies with the following dimensions are available:

| | |
|---------------------|--------------------------|
| Inner diameter (mm) | 10, 15, 25, 50, 70, 80 |
| Column length (mm) | 120, 200, 450, 750, 1000 |

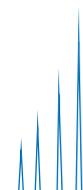
The length of the additional glass body used should be selected to allow:

- **Double the volume of slurry compared to the required packed bed volume if packing silica materials**
- **Triple the volume of slurry for softer packing materials**

The part number for the glass body is:

ECOID/length e.g. ECO10/120

If you need assistance in choosing the correct packing adapter, please contact us!



Ordering Guide

The part numbers for the columns contain information on the column type, inner diameter, maximum bed length, piston type, frit porosity and seal (O-ring) material. In brackets, the corresponding ordering code is quoted.

1. Inner diameter of your column:

| Inner Diameter [mm] | Pressure Limit [bar] |
|---------------------|----------------------|
| 10 (ECO10) | 30 |
| 15 (ECO15) | 25 |
| 25 (ECO25) | 15 |
| 50 (ECO50) | 10 |
| 70 (ECO70) | 5 |
| 80 (ECO80) | 5 |

2. Maximum bed length

| Maximum bed length [mm] |
|-------------------------|
| 120 (120) |
| 200 (200) |
| 450 (450) |
| 750 (750) |
| 1000 (999) |

3. Piston Type

I adjustable pistons: Vario (V)

II adjustable pistons: Multivario (M)

4. Frits

| Porosity |
|-------------------------|
| 10–16 μm (0) |
| 16–40 μm (3) |
| 4–100 μm (4) |

5. O-rings

| Material |
|---------------------------------------|
| Viton (V): AB versions, 10–50 mm ID |
| EPDM (E): AB versions, 70–80 mm ID |
| Kalrez® (K): SR versions, 10–80 mm ID |

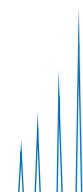
6. Temperature control

ECO glass columns are available with heating/cooling jackets.

These columns are only available with two adjustable pistons.

Ordering Guide

| | Inner diameter column | Maximum bed length | Combination of pistons | Frit Porosity | O-ring material | Heating/cooling jacket |
|------------------------------|-----------------------|-----------------------------|-------------------------------------|---------------------------|------------------------------------|--|
| Combination | ECO10 (10 mm) | 120 (max. 120 mm) | V (I adjustable piston) | 0 (10–16 µm) | V (Viton, AB) | K (only in combination with M) |
| | ECO15 (15 mm) | 200 (max. 200 mm) | | | | |
| | ECO25 (25 mm) | 450 (max. 450 mm) | M (II adjustable pistons) | 3 (16–40 µm) | E (EPDM, AB) | |
| | ECO50 (50 mm) | | | | | |
| | ECO70 (70 mm) | 750 (max. 750 mm) | 4 (40–100 µm) | K (Kalrez®, SR) | | |
| | ECO80 (80 mm) | | | | | |
| 999 (max. 1000 mm) | | | | | | |
| Example | ECO10 | 120 | M | 0 | K | -K |
| Inner diameter column | 10 mm | | | | | |
| Max. bed length | | 120 mm | | | | |
| Combination of pistons | | | 2 adjustable pistons (Multivario) | | | |
| Frit porosity | | | | 10–16 µm | | |
| O-ring material | | | | | Solvent resistant version, Kalrez® | |
| Heating/cooling jacket | | | | | | yes |



Accessories and Spare Parts

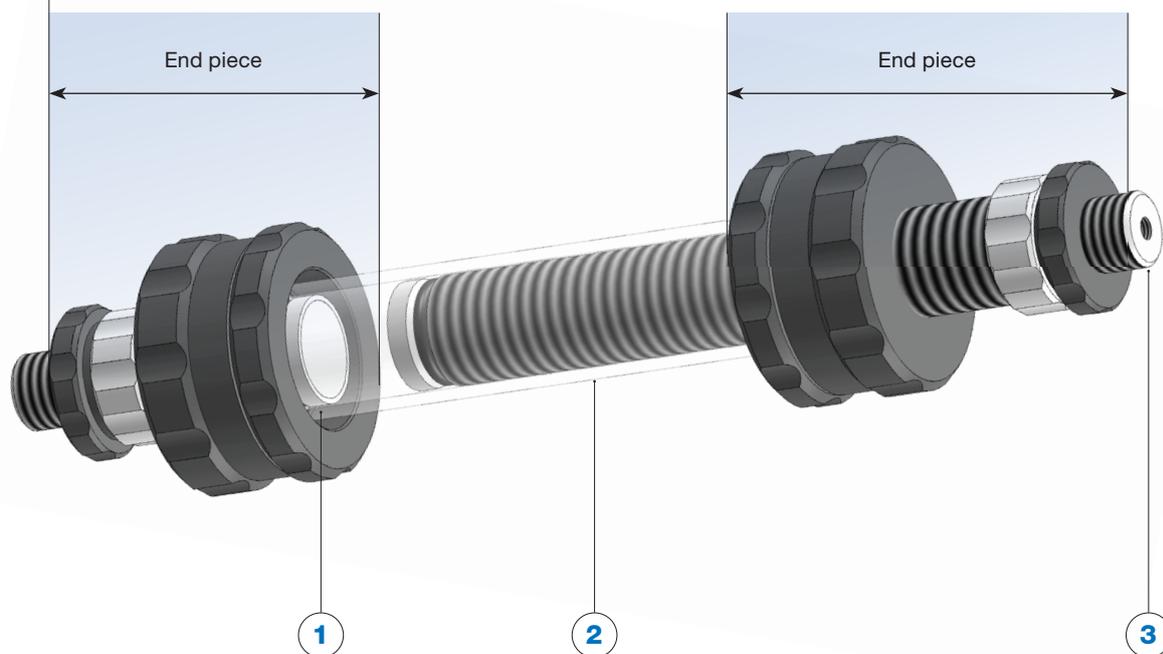
1. Column Stand: A column stand is available for ECO columns with 70 and 80 mm ID.

2. Packing adapter: Packing adapters are available for all available inner diameters in different lengths. For more information, see pages 12 and 13.



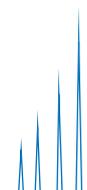
Accessories and Spare Parts

End Pieces: Assembly includes inner/external piston, counter nut and screw, screw nut, snap ring, spring washer, O-ring and frit



1. O-rings and frits
2. Glass body
3. Fittings and tubing/accessory pack

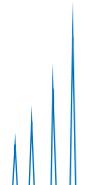
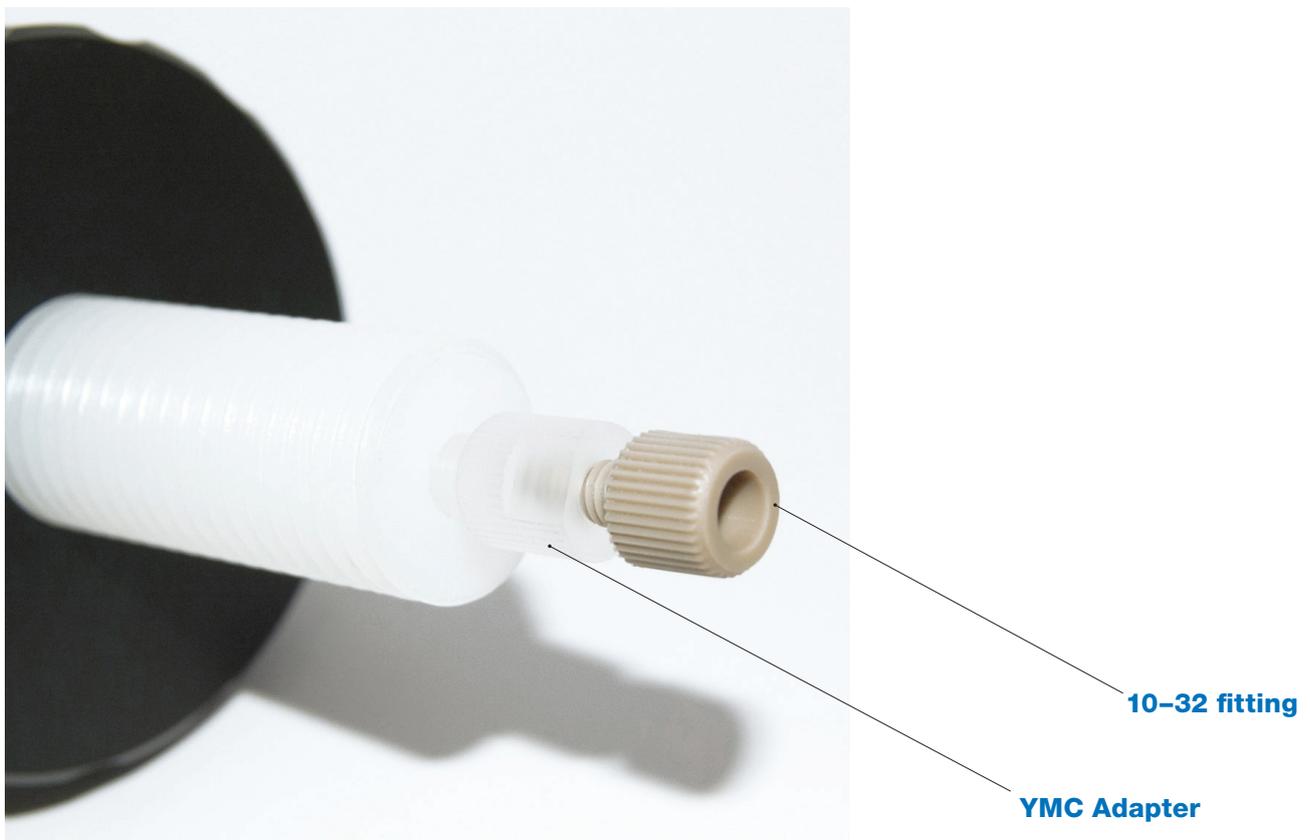
For ordering accessories or spare parts,
please check the price list at www.ymc.de or contact YMC!



Easy Connection of YMC Glass Columns to Äkta Systems

YMC have specifically designed an adapter to allow easy connection of YMC glass columns to Äkta systems. This adapter will allow direct connection of the 10-32 fittings of the Äkta systems to the inlets

and outlets of YMC glass columns. This adapter is compatible to all existing YMC glass columns with internal diameters between 10 to 50 mm and can be ordered as a pack of 2 pieces.





This tool helps you to open and close YMC glass columns.

The Handling-Loop is universally applicable to all available inner diameters of YMC ECO and ECO^{PLUS} glass column ranges.

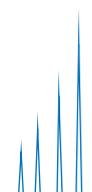
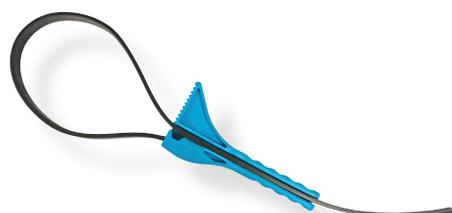
Ordering information

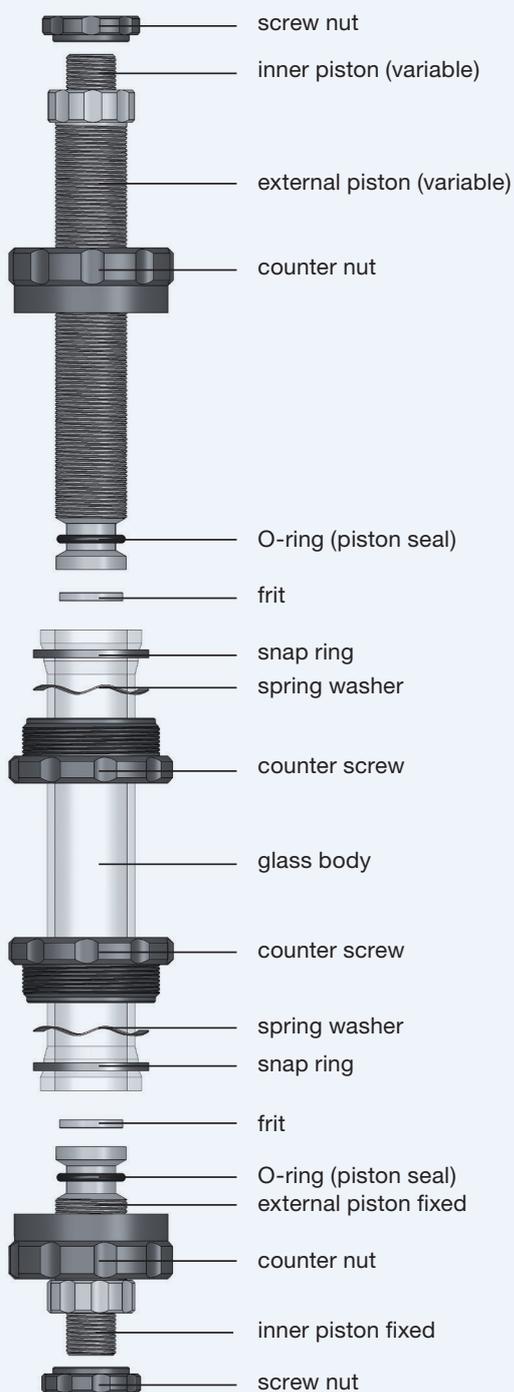
Product number: Handling-Loop

Universal strap wrench for ECO and ECO^{PLUS} columns (ID 5 – 80 mm)

The advantages of using the Handling-Loop

- ✓ Simplified opening of glass columns
- ✓ Universally applicable
- ✓ Easy grip especially with larger inner diameters





ECO

10, 15, 25, 50, 70, 80 mm ID

**120, 200, 450, 750, 1000 mm
max. bed lengths**

**Solvent resistant (SR) and
aqueous buffer (AB) versions**

AB & SR: 4–40 °C

5–30 bar

**Pistons:
POM, PVDF**

**Sealing:
Viton, EPDM, Kalrez®**

**Frits:
PE, glass or stainless steel**

**Glass Body:
Borosilicate glass 3.3**

ECO^{PLUS}

5, 10, 15, 25, 35, 50 mm ID

125, 250, 500 mm
max. bed lengths

Solvent resistant (SR) and
aqueous buffer (AB) versions

AB: 4–40 °C,
SR: 16–40 °C

15–80 bar

Pistons:
PE, PTFE

Sealing:
EPDM, PTFE

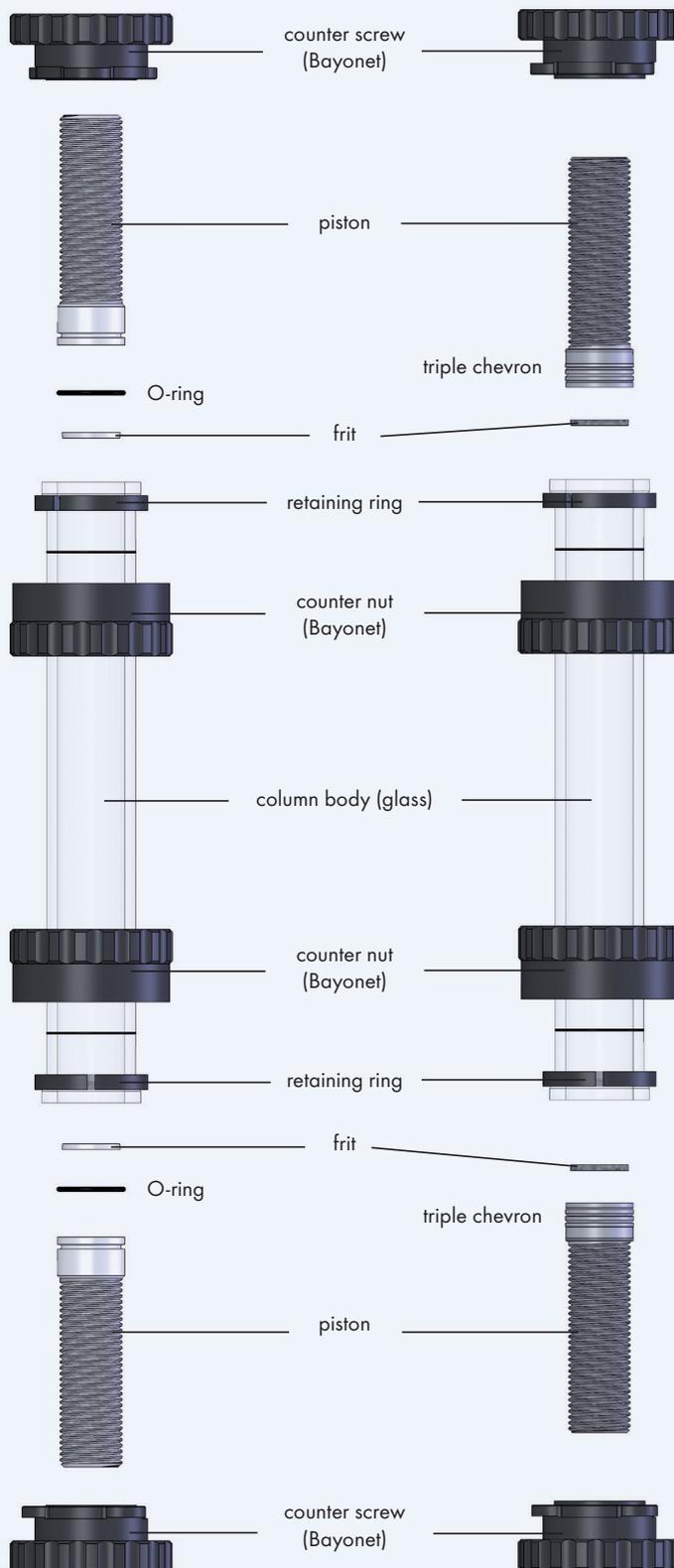
Frits:
PE, glass or stainless steel

Glass Body:
KPG* Borosilicate glass 3.3

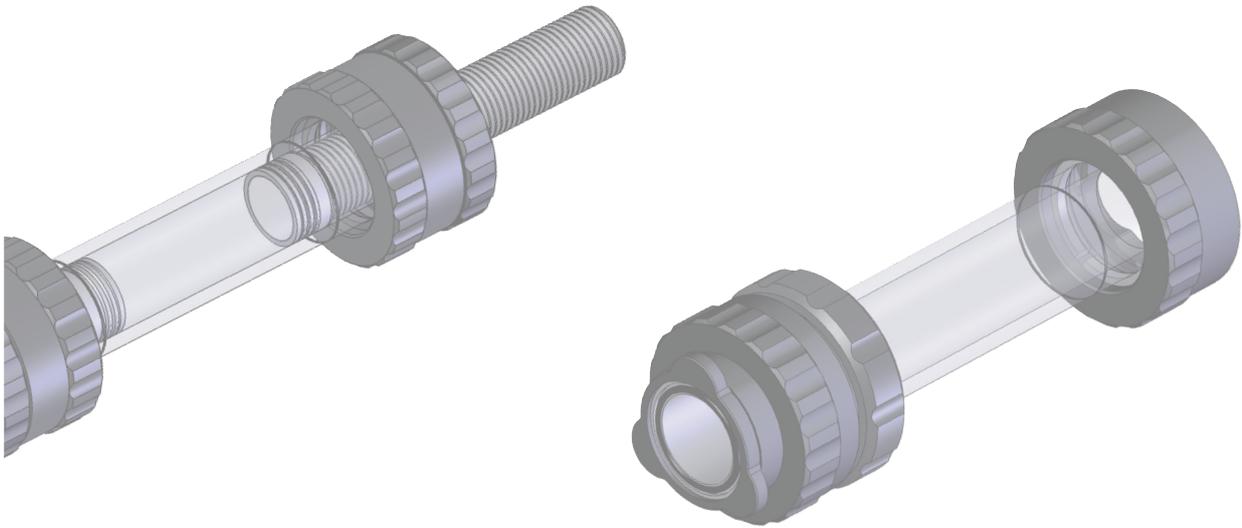
(*calibrated precision glass)

AB version

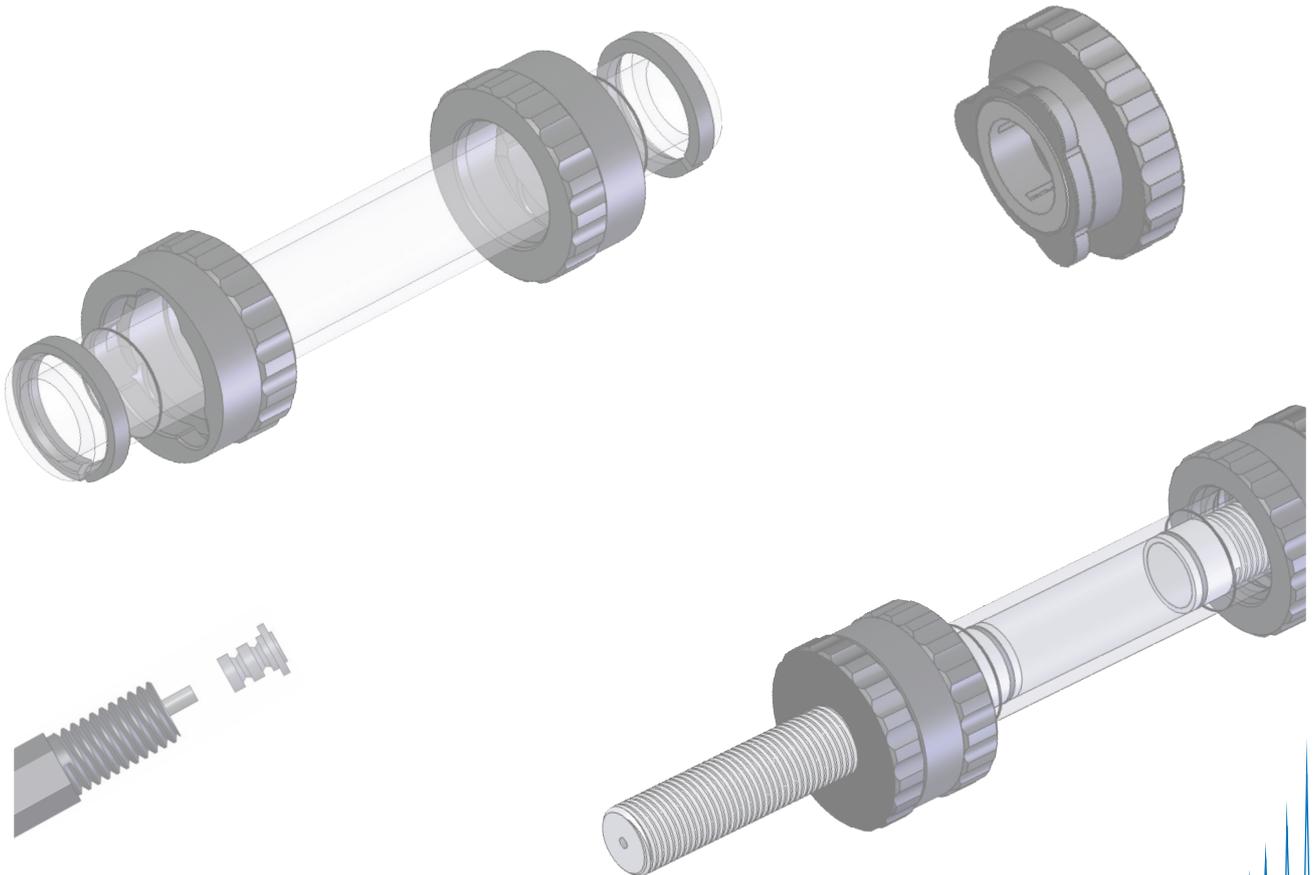
SR version







ECO^{PLUS} Glass Columns



ECO^{PLUS} Glass Columns

- **First choice for high pressure application (preparative HPLC)**
- **Pressure limit: 15–80 bar**
- **Columns with 5 mm ID available**

- Compatible with any LC system
- For all types of silica and soft gels
- Aqueous buffers and organic solvents
- Temperature range 4 - 40 °C (AB) or 16 – 40 °C (SR)
- Easy self packing

ECO^{PLUS} columns are multi-purpose columns for all types of liquid chromatography applications even with high operating pressures. The columns are available in two versions:

- 1. Aqueous buffer version (AB):**
For applications with aqueous buffers

- 2. Solvent resistant version (SR):**
For applications with organic solvents

Three different combinations of pistons are available for a wide range of bed lengths and volumes.

The solvent resistant pistons are equipped with Teflon ribs for sealing, the AB versions with O-rings.

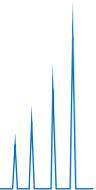
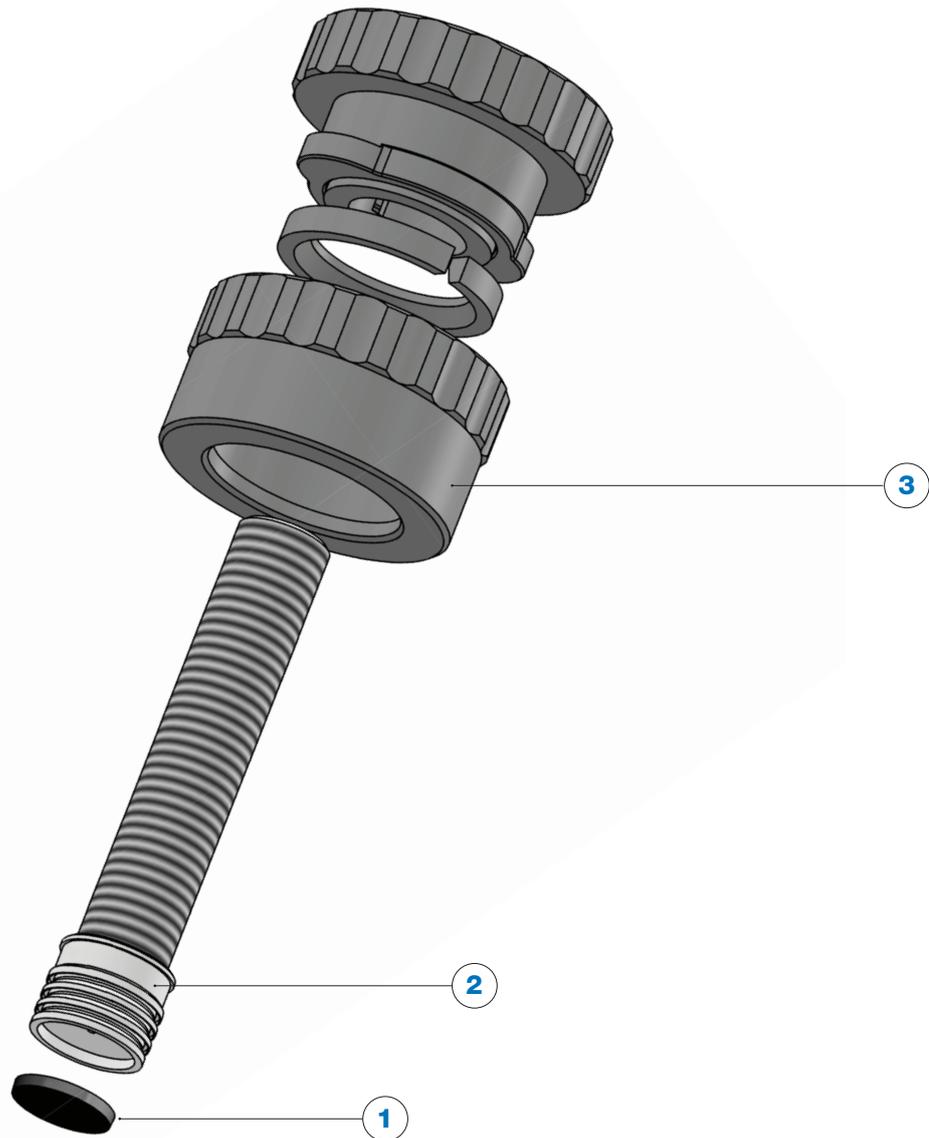
ECO^{PLUS} columns are suitable for the entire spectrum of normal phase and reversed phase chromatography as well as biochromatography.

All columns are produced in the YMC Europe facilities in Germany. The high pressure resistance is guaranteed by a special construction of the column including the locking system (Quick-Lock).

The high-quality columns are made using high precision CNC machines and undergo several rigorous quality controls before they are delivered.

Drawing of ECO^{PLUS} Solvent Resistant End Piece

1. Frit
2. Piston
3. Counter nut (Bayonet)



Specifications

| Parameter | Standard Columns |
|------------------------|-----------------------|
| Inner diameters [mm] | 5, 10, 15, 25, 35, 50 |
| Bed lengths [mm] | 125, 250, 500 |
| Pressure range* [bar] | 15–80 bar |
| Temperature range [°C] | AB: 4–40, SR: 16–40 |

| | |
|-------------------------|--|
| Versions | AB (Aqueous Buffer) |
| | SR (Solvent Resistant) |
| Combinations of pistons | Short (Two short pistons) |
| | Short/long (One short and one long piston) |
| | Long (Two long pistons) |

| | |
|---|--|
| Wetted parts | AB: PE pistons, PE frits, EPDM O-ring, KPG borosilicate glass 3.3 body |
| | SR: PTFE pistons, glass or stainless steel frits, PTFE chevrons, KPG borosilicate glass body |
| Connections | The columns are supplied with different adapters to allow direct connection to any LC-system (e.g. ÄKTA system) |
| Accessories supplied for columns with ID 5 mm | 1 x frit removal tool 2 x plugs, PTFE (1/4"-28G) 1 x 1 m ETFE 1/16" capillary tubing pre-assembled 4 x 1/4"-28G screws and ferrules for 1/16" tubing 2 x M6 screws and ferrules for 1/16" tubing 2 x 10-32 screws and ferrules for 1/16" tubing |
| Accessories supplied for columns with ID 10–15 mm | 1 x frit removal tool 2 x plugs, PTFE (1/4"-28G) 1 x 1 m FEP 1/16" capillary tubing (0.8 x 1.6 mm) 4 x 1/4"-28G screws and ferrules for 1/16" tubing 2 x M6 screws and ferrules for 1/16" tubing 2 x 10-32 screws and ferrules for 1/16" tubing |
| Accessories supplied for columns with ID 25–80 mm | 1 x frit removal tool 2 x plugs, PTFE (1/4"-28G) 1 x 1 m FEP 1/8" capillary tubing (1.6 x 3.2 mm) 4 x 1/4"-28G screws and ferrules for 1/8" tubing 2 x M6 screws and ferrules for 1/8" tubing |

Specifications

What is the difference between Short, Short/Long and Long?

For the ECO^{PLUS} column short and long pistons are available which can be combined in three different ways:

- 1. Short: Two short pistons**
- 2. Short/Long: One short and one long piston**
- 3. Long: Two long pistons**

The choice of the version depends on the required ranges of bed lengths and column volumes.

| Inner diameter (mm) | Short pistons | | Short/Long Pistons | | Long pistons | |
|---------------------|-----------------------|-------------------|-----------------------|-------------------|-----------------------|-------------------|
| | Bed length range (mm) | Volume range (mL) | Bed length range (mm) | Volume range (mL) | Bed length range (mm) | Volume range (mL) |
| 5 | 30-125 | 0.6-2.4 | 0-125 | 0-2.4 | 0-125 | 0-2.4 |
| | 150-250 | 3.0-4.9 | 70-250 | 1.4-4.9 | 0-250 | 0-4.9 |
| | 400-500 | 7.9-9.8 | 320-500 | 6.3-9.8 | 240-500 | 4.8-9.8 |
| 10 | 40-125 | 3.2-9.8 | 0-125 | 0-9.8 | 0-125 | 0-9.8 |
| | 160-250 | 13-19 | 80-250 | 6.2-19 | 0-250 | 0-19 |
| | 410-500 | 33-39 | 330-500 | 26-39 | 250-500 | 20-39 |
| 15 | 30-125 | 6-22 | 0-125 | 0-22 | 0-125 | 0-22 |
| | 155-250 | 28-44 | 75-250 | 14-44 | 0-250 | 0-44 |
| | 405-500 | 72-88 | 325-500 | 58-88 | 245-500 | 44-88 |
| 25 | 30-125 | 15-60 | 0-125 | 0-60 | 0-125 | 0-60 |
| | 160-250 | 80-120 | 80-250 | 40-120 | 0-250 | 0-120 |
| | 410-500 | 205-245 | 330-500 | 165-245 | 250-500 | 125-245 |
| 35 | 35-125 | 35-120 | 0-125 | 0-120 | 0-125 | 0-120 |
| | 160-250 | 155-240 | 80-250 | 80-240 | 0-250 | 0-240 |
| | 410-500 | 395-480 | 330-500 | 320-480 | 250-500 | 245-480 |
| 50 | 40-125 | 80-245 | 0-125 | 0-245 | 0-125 | 0-245 |
| | 170-250 | 335-490 | 90-250 | 180-490 | 0-250 | 0-490 |
| | 415-500 | 815-980 | 340-500 | 670-980 | 255-500 | 500-980 |



Pressure resistance

In order to guarantee the high pressure stability, special materials and a unique end piece system including the Quick-Lock system are used for the ECO^{PLUS} columns. The pressure resistance depends on the inner diameter and the column version (AB or SR).

| Inner Diameter [mm] | Pressure Limit [bar] |
|---------------------|--|
| 5 | AB version: 80 bar, SR version: 80 bar |
| 10 | AB version: 80 bar, SR version: 50 bar |
| 15 | AB version: 70 bar, SR version: 50 bar |
| 25 | AB version: 50 bar, SR version: 50 bar |
| 35 | AB version: 40 bar, SR version: 40 bar |
| 50 | AB version: 30 bar, SR version: 15 bar |

Chemical resistance

On the following two pages, the chemical resistances (standard conditions) for the available standard versions are listed.

ECO^{PLUS} – AB version

| Solvent | Columns with 5–50 mm ID, PE pistons, PE frits, EPDM O-rings |
|-------------------------------|---|
| Acetone | Resistant |
| Acetonitrile | Limited resistant |
| Ammonium dihydrogen phosphate | Resistant |
| Cyclohexane | Not resistant |
| Dichloromethane | Not resistant |
| EDTA | Resistant |
| Acetic acid (5 %) | Resistant |
| Ethanol | Resistant |
| Ethyl acetate | Limited resistant |
| n-hexane | Not resistant |
| Isopropanol | Resistant |
| Methanol | Resistant |
| NaOH (1 M) | Resistant |
| HCl (1 M) | Resistant |

Not resistant

Limited resistant

Resistant

Chemical resistance

ECO^{PLUS} – SR version

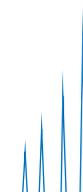
| Solvent | Columns with 5 – 35 mm ID, PTFE piston, PTFE triple chevron lamellar seals, glass/stainless steel frits | Columns with 50 mm ID, PTFE pistons, Kalrez® O-rings, stainless steel frits |
|-------------------------------|---|---|
| Acetone | Resistant | Resistant |
| Acetonitrile | Resistant | Resistant |
| Ammonium dihydrogen phosphate | Resistant | Resistant |
| Cyclohexane | Resistant | Resistant |
| Dichloromethane | Resistant | Resistant |
| EDTA | Resistant | Resistant |
| Acetic acid (5 %) | Resistant | Resistant |
| Ethanol | Resistant | Resistant |
| Ethyl acetate | Resistant | Resistant |
| n-hexane | Resistant | Resistant |
| Isopropanol | Resistant | Resistant |
| Methanol | Resistant | Resistant |
| NaOH (1 M) | Resistant | Resistant |
| HCl (1 M) | Resistant | Resistant |

Resistant

If your solvent is not listed or you need a resistant column version which is not listed, please contact us for chemical resistance check or a custom made version.

Note: The resistance of the standard versions is based on the resistance of the each wetted part. If one part is limited or not resistant, the whole column is marked with this characteristic as it is the critical part thereof.

For all columns, where the combination of the wetted parts varies from the above listed ones, the chemical resistance can vary, too. Therefore, please contact us if you need assistance regarding the chemical resistance.



Packing Adapters

For more information on column packing download the ECO^{PLUS} manual or visit one of our seminars!

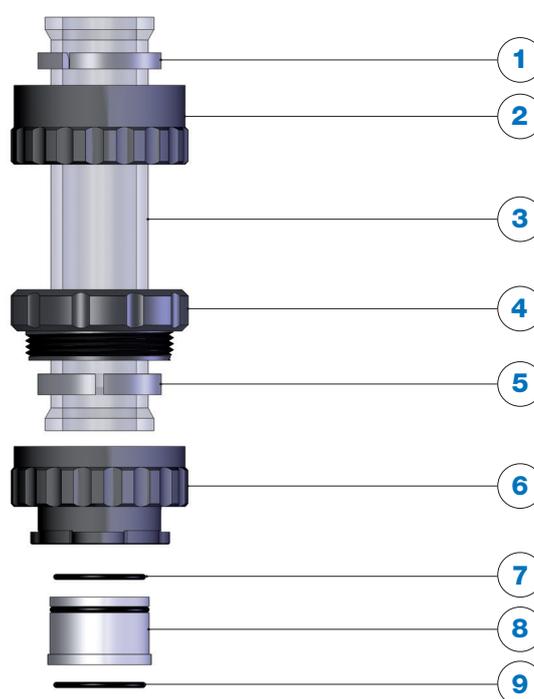
Do I need a packing adapter?

Packing adapters are used if the packing methods requires additional column volume during the packing process.

More volume than given by the column is required when the column is packed with the slurry method. A suspension of material and packing solvent in a

concentration of approximately 30 - 50% is used, depending on the packing material. The additional packing solvent above the finished column bed will be removed later but during the packing process the packing adapter gives the additional volume which is required for this method.

1. Snap ring (column version)
2. Counter nut (bayonet)
3. Glass body
(not included in column coupler)
4. Column coupler counter nut
5. Column coupler snap ring
6. Connection screw (bayonet)
7. O-ring
8. Teflon inset
9. O-ring



What are the components of the packing adapter?

The ECO^{PLUS} series of packing adapters consist of a column coupler and an empty glass body. These must be of the same diameter as the column to be packed and must be used as packing adapters,

not for extending the length of a column body during use. The product manual supplied with each column contains detailed examples of dry packing and slurry packing techniques.

How to install the packing adapter?

1. Remove the upper end piece from the column.
2. Add the column coupler counter nut (bayonet) including the column coupler snap ring to the column body.
3. Fix the connection screw and the counter nut first. Fix the column coupler counter nut afterwards.

One of our lab services is glass column packing with your material!

Packing Adapters

How to order a packing adapter?

1. Select the right column coupler

| | Inner diameter column | Identification for coupling unit | O-ring |
|-----------------------|---|----------------------------------|--|
| Combinations | TAC05 (5 mm ID) TAC10 (10 mm ID) TAC15 (15 mm ID) TAC25 (25 mm ID) TAC35 (35 mm ID) TAC50 (50 mm ID) | KU | -AB Viton O-ring -SR Kalrez® O-ring |
| Example | TAC10 | KU | -AB |
| Inner diameter column | 10 mm | | |
| O-ring | | | Viton for aqueous buffer version |

2. Select the right glass body

Glass bodies with the following dimensions are available:

| | |
|---------------------|-----------------------|
| Inner diameter (mm) | 5, 10, 15, 25, 35, 50 |
| Column length (mm) | 125, 250, 500 |

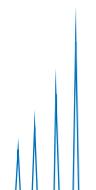
The length of the additional glass body used should be selected to allow:

- **Double the volume of slurry compared to the required packed bed volume if packing silica materials**
- **Triple the volume of slurry for softer packing materials**

The part number for the glass body is:

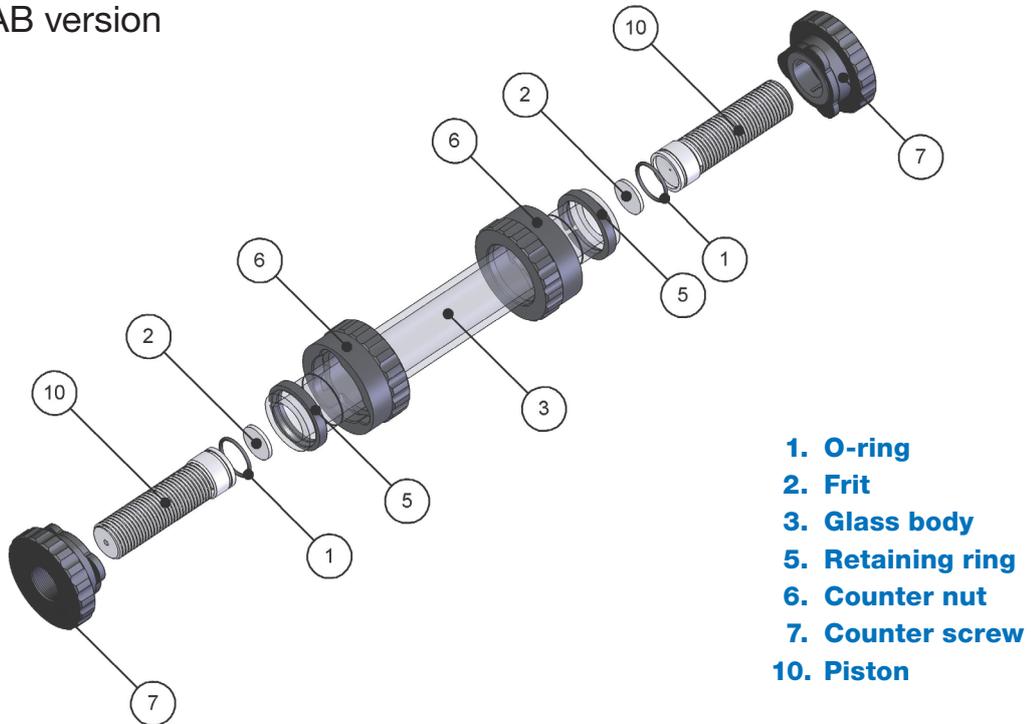
TACID/length-2 e.g. TAC10/125-2

If you need assistance in choosing the right packing adapter, please contact YMC!

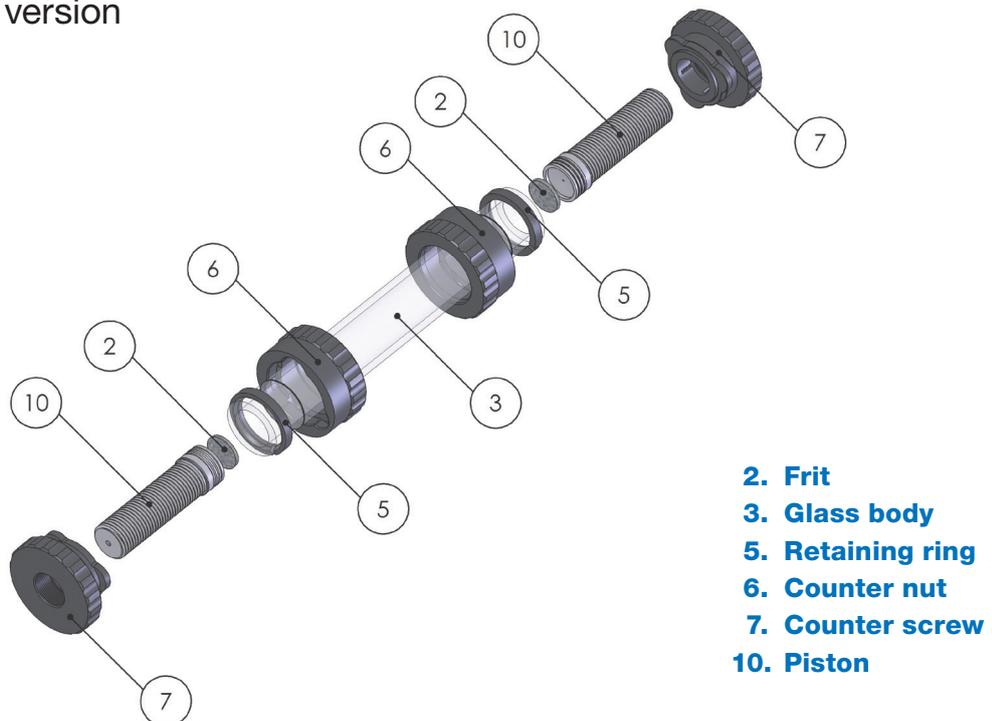


Accessories and Spare Parts

ECO^{PLUS} AB version



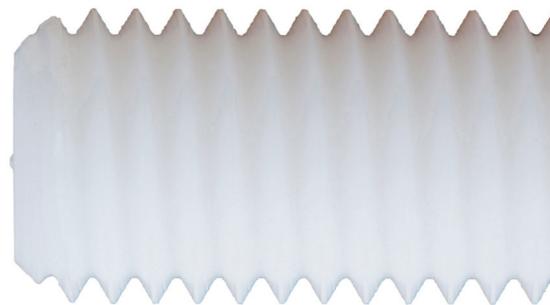
ECO^{PLUS} SR version



Accessories and Spare Parts

Spare parts available for ECO^{PLUS} glass columns:

- Glass bodies
- Pistons
- O-rings
- Frits

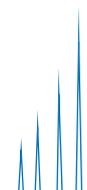


Accessories available for ECO^{PLUS} glass columns:

- Coupling units
- Tubing
- Fittings (nuts and ferrules) and adapters



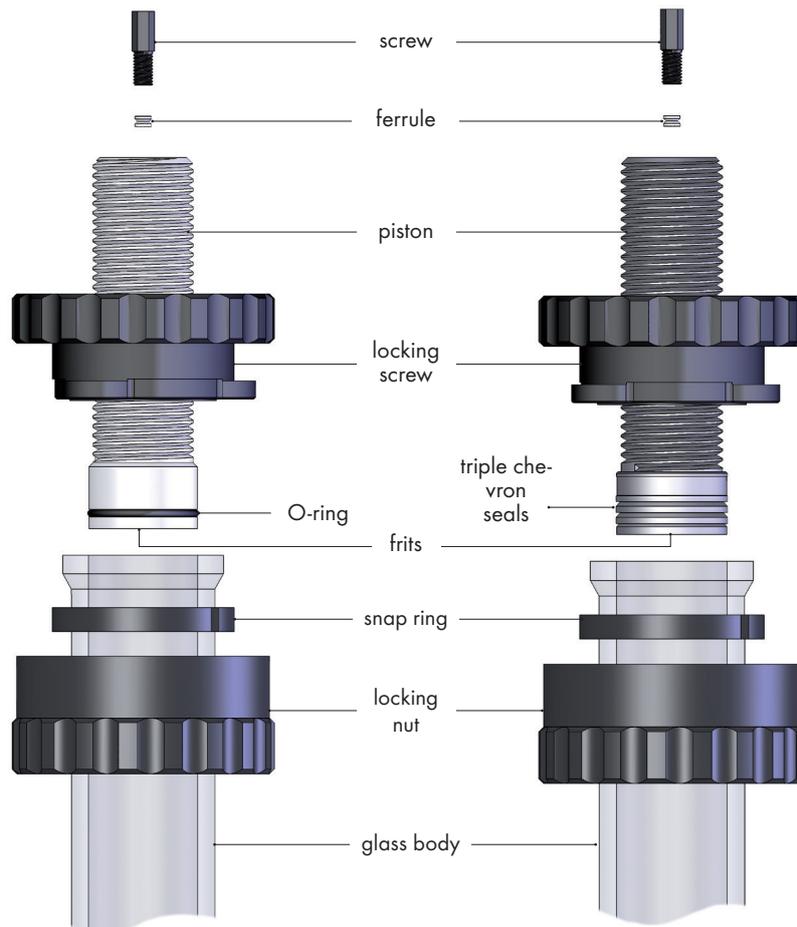
For the complete listing of all available accessories and spare parts and their related ordering codes, please download our pricelists as PDF files from www.ymc.de.



Ordering Guide

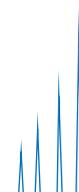
AB-Version

SR-Version



Ordering Guide

| | Inner diameter column | Maximum bed length | Combination of pistons | Frit material | Frit porosity | Version |
|------------------------|-------------------------|-----------------------------|--|--|---------------------------------|-------------------------------------|
| Combinations | TAC05 (5 mm ID) | 125 (max. 125 mm) | - (2 short pistons) | PE (polyethylene, AB version) | 2 (2 µm) | -AB-2 (aqueous buffer) |
| | TAC10 (10 mm ID) | 250 (max. 250 mm) | SL (1 short + 1 long piston) | G (sintered glass, SR version ≤ 15 mm ID) | 5 (5 µm, only for PE) | -SR-2 (solvent resistant) |
| | TAC15 (15 mm ID) | | | | | |
| | TAC25 (25 mm ID) | 500 (max. 500 mm) | L (2 long pistons) | S (stainless steel, SR version ≥ 25 mm ID) | 0 (10 µm) | |
| | TAC35 (35 mm ID) | | | | | |
| | TAC50 (50 mm ID) | | | | | |
| Example | TAC25 | 500 | | S | 2 | -SR-2 |
| Inner diameter column | 25 mm | | | | | |
| Max. bed length | | 500 mm | | | | |
| Combination of pistons | | | 2 short pistons | | | |
| Frit material | | | | stainless steel | | |
| Frit porosity | | | | | 2 µm | |
| Version | | | | | | Solvent resistant |



Training and Seminars

Packing techniques – laboratory-scale and pilot columns

ECO and ECO^{PLUS} as well as YMC Pilot^{PLUS} columns are designed for multiple packing processes with easy packing and unpacking procedures.

But how do you pack a column?

Attend one of our seminars and pack a column for yourself in the YMC application lab in Germany! Presentations and hands-on experience will enable you to pack laboratory scale and process scale columns safely and efficiently in your own labs. Important factors are discussed for safe handling of column hardware and packing materials with demonstrations and important hints for troubleshooting.

Contents

- Packing techniques (slurry- and dry-packing)
- Column performance assessment
- Hands-on training of column packing
- Troubleshooting

Target group

Chromatography operators with alternative qualifications
(laboratory assistant, technicians, engineers, chemists)

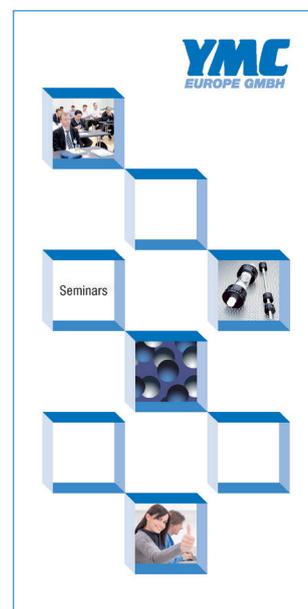
You can find actual dates for seminars in our seminar flyer at www.ymc.de

or you can contact us directly:

Phone: +49 2064 427-0

Fax: +49 2064 427-222

Email: info@ymc.de



Laboratory Services

Save time and purchase a packed column

If you are working on a tight schedule or you do not have any experience in column packing there is a solution!

Rely on the experience of YMC and ask for a packed ECO or ECO^{PLUS} column. Our knowledge of packing is your benefit!

Our services include packing of

- **ECO and ECO^{PLUS} columns**

Depending on your required bed length, you can choose a column from our portfolio. If you can't find a suitable standard product, we will gladly discuss the options of a customised column with you.

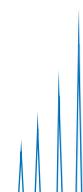
- **New glass columns and refill of your used ECO or ECO^{PLUS} column**

A second option to purchasing new column hardware is to use the option of our refill service if you already have a ECO or ECO^{PLUS} column. This service includes changing of frits and a quality control for the glass columns.

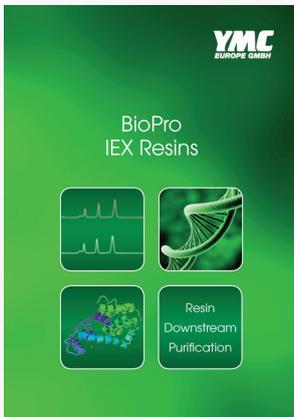
- **Stationary phases from YMC as well as from other producers**

If your method is restricted to a certain stationary phase, we pack your column according to your needs, using stationary phases made by YMC or any other producer.

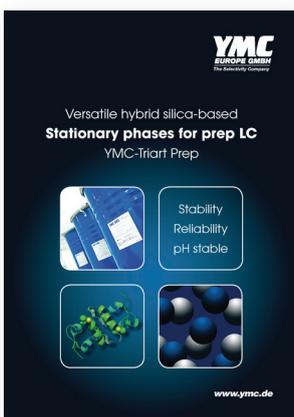
How it works:



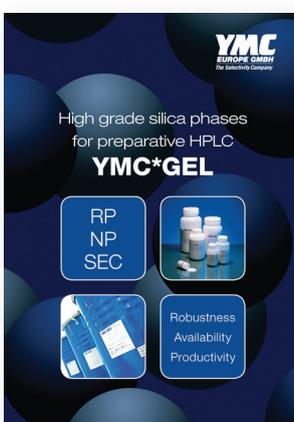
Also of interest



YMC BioPro IEXseries products are polymeric ion exchange resins for the purification of biological molecules. They represent one part of the three part YMC-Prep portfolio: silica, hybrid silica and polymer media.

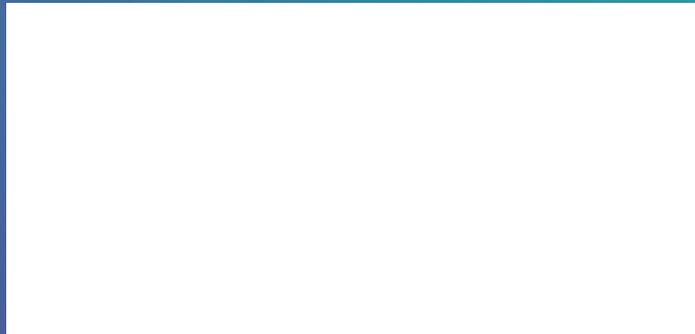


Hybrid silica phase, stable between pH 2.0 – 10.0 Available with C18 and C8 bonding.



General purpose preparative phases manufactured using a high grade silica base. Available as silica or with C18, C8, C4, C1, phenyl, cyano, amino or diol bonding.

Your local distributor:



YMC Europe GmbH

Schöttmannshof 19
D-46539 Dinslaken
Germany
Phone +49(0)2064/427-0, FAX +49(0)2064/427-222
www.ymc.de

YMC Schweiz GmbH

Im Wasenboden 8
4056 Basel
Switzerland
Phone + 41 61 561 80 50, Fax + 41 61 561 80 59
www.ymc-schweiz.ch

YMC CO., LTD.

YMC Karasuma-Gojo Bld. 284 Daigo-cho,
Karasuma Nishiiru Gojo-dori Shimogyo-ku,
Kyoto 600-8106 Japan
Phone +81(0)75-342-4515, FAX +81(0)75-342-4550
www.ymc.co.jp