

Organic SEC (GPC) Column: Rapid Preparation

Features

- Newly developed styrene divinylbenzene copolymer monodisperse particles
- Can deliver at four times higher flow rate (10 mL/min or more) compared with conventional products
- Achieves rapid recycling separation
- Suitable for the separation of samples in a wide molecular weight range due to its wide linear range and large pore volume
- Usable with various organic solvents such as THF, toluene, dichloroethane, ethyl acetate, DMF, and acetone used in GPC analysis in addition to chloroform

FP-2002

- Preparative columns [Preparative columns are made to order.]

Product Code	Product Name	Plate Number (TP/column)	Particle Size (μm)	Column Size (mm) I.D. x Length
F6102520	GPC FP-2002	≥ 30,000	8	20.0 x 600
F6700340	GPC FP-G 8B	(guard column)	8	8.0 x 50

Base Material: Styrene divinylbenzene copolymer
Shipping Solvent: Chloroform

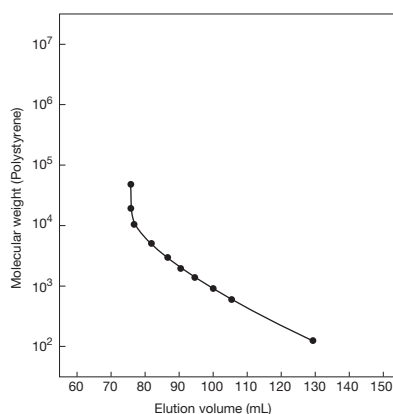
Target molecular weight range and exclusion limit

- Measured with polystyrene (eluent: chloroform)

Product Name	Target Molecular Weight Range	Exclusion Limit
FP-2002	100 - 5,000	8,000

Please use the above tables for reference purposes only when selecting columns.

Calibration curve for FP-2002 using polystyrene

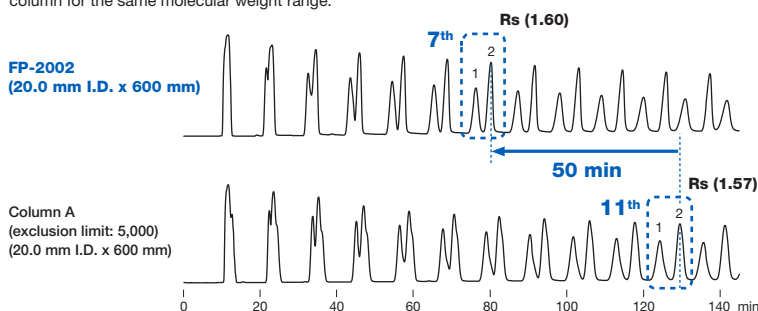


Column : Shodex GPC FP-2002
Eluent : Chloroform
Flow rate : 10 mL/min
Detector : UV (254 nm)
(preparative type)
Column temp. : 30 °C

Comparison of recycling separation

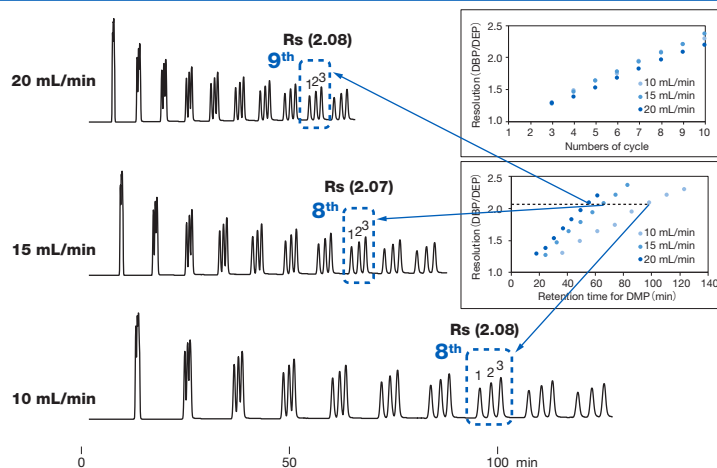
GPC FP-2002 is a column suitable for rapid organic solvent SEC(GPC) separation. Phthalate esters were used to compare recycled separations with other manufacturer's rapid preparative column (exclusion limit: 5,000). The recycling separation using FP-2002 can be made faster than other column for the same molecular weight range.

Sample : 10 % each, 2 mL
1. Ditridecyl Phthalate (MW: 530)
2. Bis(*trans*-3,3,5-trimethylcyclohexyl) phthalate (MW: 414)



Column : Shodex GPC FP-2002
Column A from other manufacturer
Eluent : Chloroform
Flow rate : 10 mL/min
Detector : UV (254 nm) (preparative type)
Column temp. : 30 °C

Effects of flow rate for recycling separation



The standard flow rate of the packed column GPC FP-2002 for organic solvent-based SEC (GPC) is 10 mL/min. We have investigated the flow rate dependency of phthalate esters recycling separation. Even at the maximum usable flow rate of 20 mL/min, there is no extreme drop in column efficiency and further speeding up is possible.

(Note) In the case of a polymer sample, shear degradation of the polymer tends to occur as the molecular weight increases. It is recommended to lower the flow rate, if there is a possibility that shear degradation occurred.

Sample : 3 % each, 1 mL
1. Dibutyl phthalate (DBP) (MW: 278)
2. Diethyl phthalate (DEP) (MW: 222)
3. Dimethyl phthalate (DMP) (MW: 194)

Column : Shodex GPC FP-2002
Eluent : Chloroform
Detector : UV (254 nm) (preparative type)
Column temp. : 30 °C

Organic SEC (GPC) Columns: Preparative

- **Preparative columns** [Preparative columns are made to order.]

GPC KF-2000 series Shipping Solvent: Tetrahydrofuran (THF)

Product Code	Product Name	Plate Number (TP/column)	Particle Size (µm)	Column Size (mm) I.D. x Length	Standard Column
F6102401	GPC KF-2001	≥ 18,000	6	20.0 x 300	KF-801
F6102402	GPC KF-2002	≥ 18,000	6	20.0 x 300	KF-802
F6102425	GPC KF-2002.5	≥ 18,000	6	20.0 x 300	KF-802.5
F6102403	GPC KF-2003	≥ 18,000	6	20.0 x 300	KF-803
F6102404	GPC KF-2004	≥ 14,000	7	20.0 x 300	KF-804
F6102405	GPC KF-2005	≥ 10,000	10	20.0 x 300	KF-805
F6102406	GPC KF-2006	≥ 10,000	10	20.0 x 300	KF-806
F6102409	GPC KF-2006M	≥ 10,000	10	20.0 x 300	KF-806M
F6700406	GPC KF-G 8B	(guard column)	15	8.0 x 50	(guard column)

KF-2006M is a mixed-gel column capable of analyzing samples over a wide range of molecular weight distribution. Base Material: Styrene divinylbenzene copolymer

GPC K-2000 series Shipping Solvent: Chloroform

Product Code	Product Name	Plate Number (TP/column)	Particle Size (µm)	Column Size (mm) I.D. x Length	Standard Column
F6102301	GPC K-2001	≥ 18,000	6	20.0 x 300	KF-801
F6102312	GPC K-2002	≥ 18,000	6	20.0 x 300	KF-802
F6102315	GPC K-2002.5	≥ 18,000	6	20.0 x 300	KF-802.5
F6102303	GPC K-2003	≥ 18,000	6	20.0 x 300	KF-803
F6102304	GPC K-2004	≥ 14,000	7	20.0 x 300	KF-804
F6102305	GPC K-2005	≥ 10,000	10	20.0 x 300	KF-805
F6102306	GPC K-2006	≥ 10,000	10	20.0 x 300	KF-806
F6102309	GPC K-2006M	≥ 10,000	10	20.0 x 300	KF-806M
F6700407	GPC K-G 8B	(guard column)	15	8.0 x 50	(guard column)

K-2006M is a mixed-gel column capable of analyzing samples over a wide range of molecular weight distribution. Base Material: Styrene divinylbenzene copolymer

[Customized columns]

GPC H-2000 series Shipping Solvent: Chloroform

Product Code	Product Name	Plate Number (TP/column)	Particle Size (µm)	Column Size (mm) I.D. x Length	Standard Column
F6102001	GPC H-2001	≥ 13,000	15	20.0 x 500	KF-801
F6102002	GPC H-2002	≥ 13,000	15	20.0 x 500	KF-802
F6102025	GPC H-2002.5	≥ 13,000	15	20.0 x 500	KF-802.5
F6102003	GPC H-2003	≥ 13,000	15	20.0 x 500	KF-803
F6102004	GPC H-2004	≥ 13,000	15	20.0 x 500	KF-804
F6102005	GPC H-2005	≥ 13,000	15	20.0 x 500	KF-805
F6102006	GPC H-2006	≥ 13,000	15	20.0 x 500	KF-806
F6102009	GPC H-2006M	≥ 12,000	15	20.0 x 500	KF-806M
F6700310	GPC H-G 8B	(guard column)	15	8.0 x 50	(guard column)

H-2006M is a mixed-gel column capable of analyzing samples over a wide range of molecular weight distribution. Base Material: Styrene divinylbenzene copolymer

GPC KF-5000 series Shipping Solvent: Tetrahydrofuran (THF)

Product Code	Product Name	Particle Size (µm)	Column Size (mm) I.D. x Length	Standard Column
F6108010	GPC KF-5001	15	50.0 x 300	KF-801
F6108020	GPC KF-5002	15	50.0 x 300	KF-802
F6108025	GPC KF-5002.5	15	50.0 x 300	KF-802.5
F6108030	GPC KF-5003	15	50.0 x 300	KF-803
F6108040	GPC KF-5004	15	50.0 x 300	KF-804
F6700408	GPC KF-G 20C	15	20.0 x 100	(guard column)

Base Material: Styrene divinylbenzene copolymer

GPC K-5000 series Shipping Solvent: Chloroform

Product Code	Product Name	Particle Size (µm)	Column Size (mm) I.D. x Length	Standard Column
F6109010	GPC K-5001	15	50.0 x 300	KF-801
F6109020	GPC K-5002	15	50.0 x 300	KF-802
F6109025	GPC K-5002.5	15	50.0 x 300	KF-802.5
F6109030	GPC K-5003	15	50.0 x 300	KF-803
F6109040	GPC K-5004	15	50.0 x 300	KF-804
F6700409	GPC K-G 20C	15	20.0 x 100	(guard column)

Base Material: Styrene divinylbenzene copolymer