

Organic SEC (GPC) columns : Linear calibration type

Features

- LF**
- Employs a special packing material with a wide pore size distribution (multi pore type)
 - Enables analysis over a broad range of molecular weights (1 to 2 million)
 - Highly linear calibration curve without inflection points
 - Molecular weight distribution can be determined with high precision
 - Columns for rapid analysis (LF-604) and columns for high performance analysis (LF-404) enabling reduction in solvent use are also available



No.1



No.4, 40

Standard columns

Product Code	Product Name	Plate Number (TP/column)	Exclusion Limit (PS)	Particle Size (μm)	Maximum Pore Size (Å)	Column Size (mm) I.D. x L
F6021041	GPC LF-804	≥ 17,000	2,000,000	6	3,000	8.0 x 300
F6709621	GPC LF-G	(guard column)	-	6	-	4.6 x 10

Shipping solvent : tetrahydrofuran(THF)

Rapid analysis downsized columns

◎ Use of the LF-604 series with semi-micro type devices is recommended.

F6021042	GPC LF-604	≥ 9,000	2,000,000	6	3,000	6.0 x 150
F6709621	GPC LF-G	(guard column)	-	6	-	4.6 x 10

Shipping solvent : tetrahydrofuran(THF)

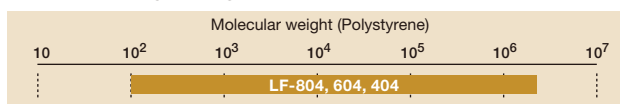
High-performance semi-micro column

◎ Use of the LF-404 series with semi-micro type devices is recommended.

F6021043	GPC LF-404	≥ 14,000	2,000,000	6	3,000	4.6 x 250
F6709621	GPC LF-G	(guard column)	-	6	-	4.6 x 10

Shipping solvent : tetrahydrofuran(THF)

Molecular weight range with polystyrene (eluent : THF)



High temperature/Ultra high temperature analysis SEC (GPC) columns

Features

- HT-800**
- Varied product lineup to support a wide range of molecular weights
- UT-800**
- Dedicated to SEC analysis at high/ultra high temperatures with a maximum usable temperature of 210°C
 - Suitable for the analysis of supermolecule-containing samples

Standard columns

Product Code	Product Name	Plate Number (TP/column)	Exclusion Limit * (PS)	Usable Temperature (°C)	Particle Size (μm)	Maximum Pore Size (Å)	Column Size (mm) I.D. x L
F6208700	GPC HT-803	≥ 7,000	70,000	100-150	13	500	8.0 x 300
F6208710	GPC HT-804	≥ 7,000	400,000	100-150	13	1,500	8.0 x 300
F6208720	GPC HT-805	≥ 7,000	4,000,000	100-150	13	5,000	8.0 x 300
F6208730	GPC HT-806	≥ 7,000	(20,000,000)**	100-150	13	10,000	8.0 x 300
F6208740	GPC HT-806M	≥ 7,000	(20,000,000)**	100-150	13	10,000	8.0 x 300
F6208770	GPC HT-807	≥ 4,000	(200,000,000)**	100-150	18	20,000	8.0 x 300
F6709410	GPC HT-G	(guard column)	-	100-150	13	-	8.0 x 50
F6208600	GPC UT-802.5	≥ 4,400	20,000	100-210	30	300	8.0 x 300
F6208610	GPC UT-806M	≥ 4,400	(20,000,000)**	100-210	30	10,000	8.0 x 300
F6208620	GPC UT-807	≥ 3,300	(200,000,000)**	100-210	30	20,000	8.0 x 300
F6709400	GPC UT-G	(guard column)	-	100-210	30	-	8.0 x 50
F6208390	GPC AT-806MS	≥ 6,000	(20,000,000)**	Ta-150***	12	10,000	8.0 x 250
F6700280	GPC AT-G	(guard column)	-	Ta-150***	15	-	8.0 x 50

* The columns with 'M' at the end of the column name are mixed-gel columns capable of a wide molecular weight distribution range of samples.

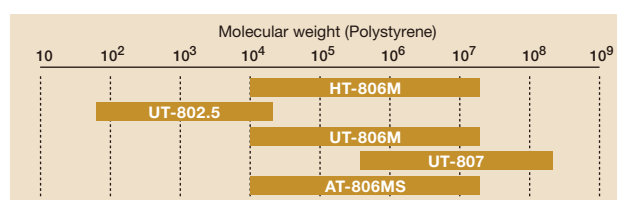
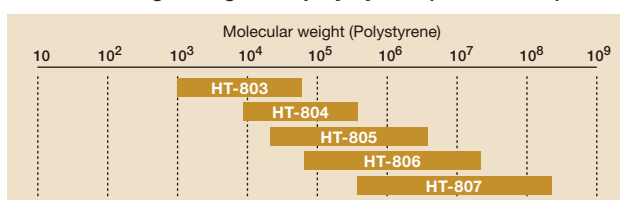
Shipping solvent : toluene

*Exclusion limit was measured with THF

** () Estimated value

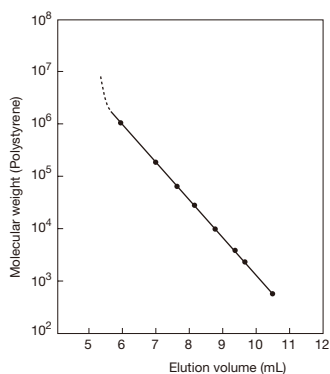
*** Ta : ambient temperature

Molecular weight range with polystyrene (eluent : THF)



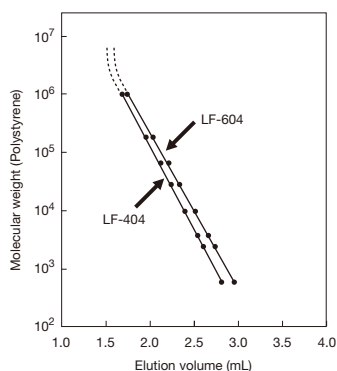
*Contact Shodex or our distributors near you for customized columns.

Calibration curve for LF-804 using PS standard



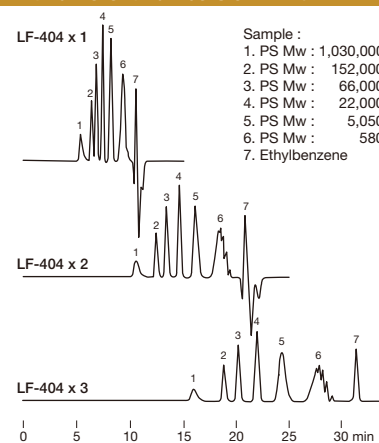
Column : Shodex GPC LF-804
Eluent : THF
Flow rate : 1.0mL/min
Detector : RI
Column temp. : 40°C

Calibration curves for LF-604 and LF-404 using PS standard



Column : Shodex GPC LF-604, LF-404
Eluent : THF
Flow rate : (LF-604) 0.5mL/min
(LF-404) 0.3mL/min
Detector : RI (small cell volume)
Column temp. : 40°C

Comparison of polystyrene separation with different numbers of LF-404

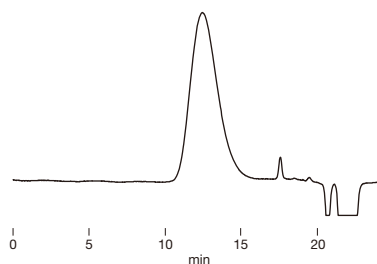


Sample :
1. PS Mw : 1,030,000
2. PS Mw : 152,000
3. PS Mw : 66,000
4. PS Mw : 22,000
5. PS Mw : 5,050
6. PS Mw : 580
7. Ethylbenzene

Column : Shodex GPC LF-404 x n
Eluent : THF
Flow rate : 0.3mL/min
Detector : RI (small cell volume)
Column temp. : 40°C

Polyurethane

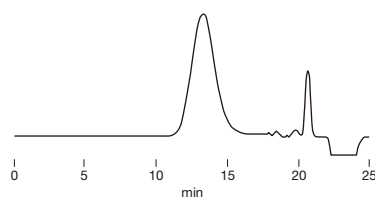
Sample : Polyurethane 0.1%, 20µL



Column : Shodex GPC LF-404 x 2
Eluent : THF
Flow rate : 0.3mL/min
Detector : RI (small cell volume)
Column temp. : 40°C

Polyamide (Nylon6/6)

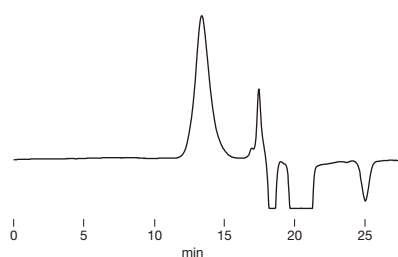
Sample : Nylon™ 6/6 0.1%, 20µL



Column : Shodex GPC LF-404
Eluent : 5mM CF₃COONa in HFIP
Flow rate : 0.15mL/min
Detector : RI (small cell volume)
Column temp. : 40°C

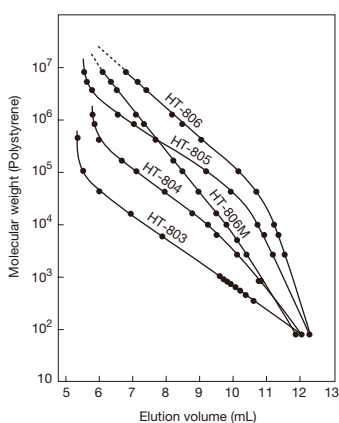
Xylan

Sample : Xylan 0.1%, 100µL



Column : Shodex GPC LF-804
Eluent : 20mM H₃PO₄ + 20mM LiBr in (DMSO/DMF=80/20)
Flow rate : 0.6mL/min
Detector : RI
Column temp. : 50°C

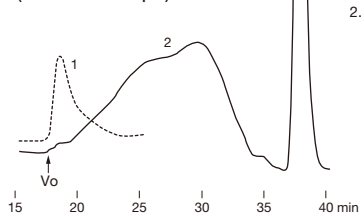
Calibration curves for HT-800 series using PS



Column : Shodex GPC HT-800 series
Eluent : THF
Flow rate : 1.0mL/min
Detector : RI
Column temp. : Room temp.

Effect of the particle size of material packed in high temperature SEC columns

Column : UT-806M x 3 (Partical size : 30µm)

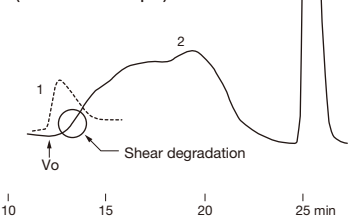


Sample :
1. Polystyrene (MW : 20,000,000)
2. HDPE-A

For the analysis of samples containing macromolecules, GPC UT columns are recommended because of their ability to prevent the breakage of molecular chains. High temperature SEC columns are suitable for the analysis of insoluble polymers, such as polyethylene and polypropylene.

Column : Shodex GPC UT-806M HT-806M, AT-806MS
Eluent : 0.1% BHT in ODCB
Flow rate : 1.0mL/min
Detector : RI
Column temp. : 140°C

Column : HT-806M x 2 (Partical size : 13µm)



Column : AT-806MS x 2 (Partical size : 12µm)

