AGILENT GPC/SEC POLYMER STANDARDS

Agilent Technologies

Contents

1976

PLgel columns, individual standards, and standard kits

Polymer Laboratories founded to develop market-leading products for organic GPC/SEC

1981

PLgel MIXED columns, PL aquagel columns

MIXED columns improve data quality, and novel chemistries for analysis of water-soluble polymers

1984

GPC software

Dedicated software streamlines GPC/SEC calculations

1993

EasiCal standards

New format shortens sample preparation time and the speed of calibration

1999

PL-GPC 220 instrument

Market-leading high temperature GPC system for even the most difficult samples at temperatures up to 220 °C

POLYMER STANDARDS FOR GPC/SEC

Agilent manufactures the widest range of polymer standards on the market. These standards are critical for generating accurate results on:

- GPC/SEC systems
- Viscometers
- Light scattering systems

Polymer standards are available in powder form, and in prepared InfinityLab EasiVial and EasiCal formats, which save time by eliminating tedious weighing procedures in the lab.

Ultra-narrow molecular weight (MW) standards are available in 1, 5, and 10 g quantities from Agilent, for further use as model polymers in research and analytical development.

All Agilent standards are manufactured, under ISO 9001:2008 approved quality system. Each is fully traceable with a unique batch number and a complete certification of analysis (COA).

Finally, all COAs include details of the exact method and characterization results for maximum transparency and reproducibility.

2004

PlusPore columns and EasiVial standards

New chemistries deliver high-pore-volume materials for increased resolution, and EasiVial standards simplify calibration procedures even further

2007

PLgel Olexis columns

Optimized for polyolefin analysis with highest resolution and data quality for even ultrahigh molecular weight samples

2009

1260 Infinity Multi Detector Suite and PolarGel columns

The 1260 Infinity MDS turns any LC into a powerful multi-detector GPC system, and PolarGel columns analyze polar samples in any solvent system

2015

The 1260 Infinity II Multi-Detector GPC/SEC System

The first choice for accurate, reproducible polymer analysis. Select any combination of light scattering, viscometry and refractive index detection for absolute molecular weights and sizes.

2017

PL MultiSolvent GPC columns

The newest addition to the InfinityLab GPC family, offering solvent flexibility for a variety of GPC analyses all on one column.

POLYMER STANDARDS FOR GPC/SEC

Unbeatable precision and variety

Agilent provides the widest range of MW standards on the market, from 162 to 15 million g/mol.

Even at the highest MWs, Agilent standards are made with the utmost precision, and the polydispersity remains ≤1.10. This low polydispersity means that distorted peaks are easily identified before they can skew the calibration and the measurement.

Individual standards are generally available in 1, 5, and 10 g quantities.

Calibration kits: for column and instrument calibration

For GPC/SEC column calibration, Agilent provides kits covering both a wide range of MWs and a wide variety of solvents.

Each kit has been preselected to generate an even distribution of points across the chosen MW range.

Each polymer in the kit is individually certified, and all necessary data is provided to generate a calibration curve straight out of the box.

For more information on choosing the correct standards for a particular eluent, see page 15.

Market leading Agilent GPC and SEC columns have set the standard for reliability, speed, and performance for over 40 years:

- Organic GPC/SEC columns, publication 5990-7994EN
- Aqueous and polar GPC/SEC columns, publication 5990-7995EN

Standards selection guide

Polymer Type	Individual MW	Calibration Kits	InfinityLab EasiCal	InfinityLab EasiVial	Solvent System	UV/Vis Signal
Polystyrene	Yes	Yes	Yes	Yes	Primary: Organic	Strong
Polymethylmethacrylate	Yes	Yes		Yes	Primary: Polar Organic Secondary: Organic	Strong
Polyethylene glycol/oxide (PEG/PEO)	Yes	Yes		Yes	Primary: Aqueous Secondary: Polar Organic	Weak
Polyacrylic acid	Yes	Yes			Primary: Aqueous Secondary: Polar Organic	Strong

INFINITYLAB EASIVIAL

Part of the **InfinityLab** family

Just add solvent

- Eliminates analyst hours wasted on tedious weighing procedures
- Widely applicable to room temperature, high temperature, and multidetector GPC
- Each vial contains equidistant peaks that are easily baseline resolved

For organic and aqueous GPC/SEC column calibration, InfinityLab EasiVial is the quickest and most convenient method to deliver an accurate 12-point column calibration.

InfinityLab EasiVial kits are prepared sets of three vials, each containing four standards spaced across the full MW range of the kit.

Simply add solvent and the standards are ready to use. With just one injection from each vial, a column is fully calibrated and ready for data collection.

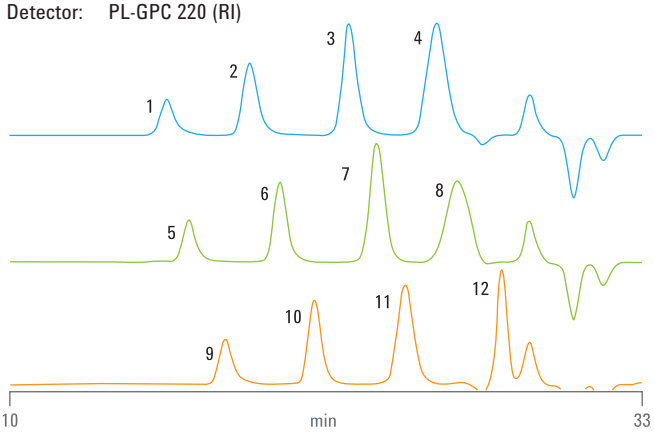
Each kit contains 10 vials of each type (30 total) that are color coded for easy identification. Both 2 and 4 mL vials are available to suite most autosamplers.

Appropriate InfinityLab EasiVial kits are available for all solvent systems: Polystyrene (PS), Polymethylmethacrylate (PMMA), and Polyethylene glycol/oxide (PEG/PEO).

Ultra-narrow range MW standards allow easy identification of column degradation before it can alter results.

Conditions

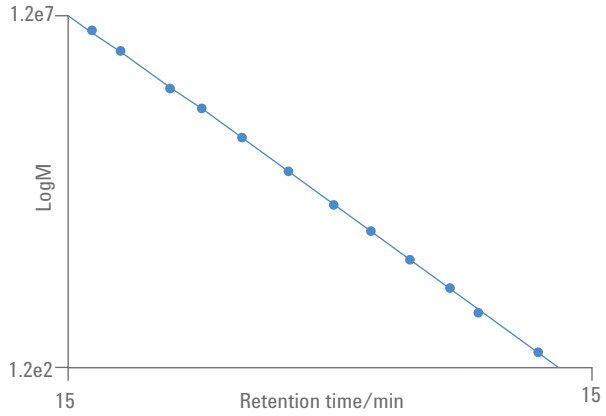
Columns: 3 x PLgel 10 µm MIXED-B, 7.5 x 300 mm
Eluent: THF
Flow Rate: 1.0 mL/min
Temp: 40 °C
Detector: PL-GPC 220 (RI)



InfinityLab EasiVial PS-H

Peak Identification

1. 6,035,000	5. 3,053,000	9. 915,000
2. 483,000	6. 184,900	10. 60,450
3. 19,720	7. 8,450	11. 3,370
4. 1,260	8. 580	12. 162



Tightly characterized standards eliminate error in the calibration curve for high accuracy measurements.

INFINITYLAB EASIVIAL

Part of the **InfinityLab** family

Specifications

InfinityLab EasiVial color	InfinityLab EasiVial PS-H	InfinityLab EasiVial PS-M	InfinityLab EasiVial PS-L	InfinityLab EasiVial PM	InfinityLab EasiVial PEG/PEO	InfinityLab EasiVial PEG
	Nominal Mp (g/mol)					
Red	1,300	1,000	580	2,000	600	282
	20,000	7,000	3,000	30,000	13,000	1,000
	500,000	50,000	10,000	300,000	130,000	7,000
	7,000,000	500,000	50,000	1,500,000	1,500,000	30,000
Yellow	580	370	370	1,000	194	194
	10,000	3,000	2,000	13,000	4,000	600
	200,000	30,000	7,000	130,000	70,000	4,000
	3,000,000	200,000	30,000	1,000,000	1,000,000	20,000
Green	162	162	162	500	106	106
	5,000	1,300	1,000	7,000	1,500	400
	70,000	13,000	5,000	70,000	30,000	1,500
	1,000,000	100,000	20,000	500,000	500,000	13,000

PS = polystyrene
PM = polymethylmethacrylate
H = standards to high molecular weight
M = standards to medium molecular weight
L = standards to low molecular weight

Agilent InfinityLab
Maximize Your LC Workflow Efficiency

How can you make your LC workflow more efficient, so you can spend more time on your analytical priorities?

Find out—with Agilent InfinityLab—an optimized portfolio of LC instruments, columns, and supplies designed to work together in perfect harmony.

Learn more at:
www.agilent.com/chem/infinitylab

INFINITYLAB EASIVIAL

Part of the **InfinityLab** family

Ordering information

InfinityLab EasiVial pre-weighed calibration kits

Description	Vial Volume (mL)	Quantity (Vials/Kit)	Part No.
EasiVial PEG/PEO	2	30	PL2080-0201
EasiVial PEG/PEO	4	30	PL2080-0200
EasiVial PEG	2	30	PL2070-0201
EasiVial PEG	4	30	PL2070-0200
EasiVial PM	2	30	PL2020-0201
EasiVial PM	4	30	PL2020-0200
EasiVial PS-H	2	30	PL2010-0201
EasiVial PS-H	4	30	PL2010-0200
EasiVial PS-M	2	30	PL2010-0301
EasiVial PS-M	4	30	PL2010-0300
EasiVial PS-L	2	30	PL2010-0401
EasiVial PS-L	4	30	PL2010-0400
PEG/PEO Tri-Pack	2	90	PL2080-0202
PEG/PEO Tri-Pack	4	90	PL2080-0203
PEG Tri-Pack	2	90	PL2070-0202
PEG Tri-Pack	4	90	PL2070-0203
PMMA Tri-Pack	2	90	PL2020-0202
PMMA Tri-Pack	4	90	PL2020-0203
PS-H Tri-Pack	2	90	PL2010-0202
PS-H Tri-Pack	4	90	PL2010-0203
PS-M Tri-Pack	2	90	PL2010-0302
PS-M Tri-Pack	4	90	PL2010-0303
PS-L Tri-Pack	2	90	PL2010-0402
PS-L Tri-Pack	4	90	PL2010-0403

See also

Organic GPC/SEC columns, publication 5990-7994EN

Aqueous and polar GPC/SEC columns, publication 5990-7995EN

INFINITYLAB EASICAL

Part of the **InfinityLab** family

Stir-in calibration standards

- Easy three-step process with no fuss
- Cost effective format saves money
- Only two injections for improved productivity

The InfinityLab EasiCal system for organic solvents consists of two different combs, each with ten detachable spatulas supporting a mixture of five polymer standards. The thin film of polymer (approximately 5 mg) on the tip of the PTFE spatulas rapidly dissolves when immersed in solvent to provide two GPC/SEC calibration solutions. A single pack provides ten spatulas of each type, with MW standards selected to provide equidistant calibration points for greater accuracy.

See also

Organic GPC/SEC columns, publication 5990-7994EN

Aqueous and polar GPC/SEC columns, publication 5990-7995EN

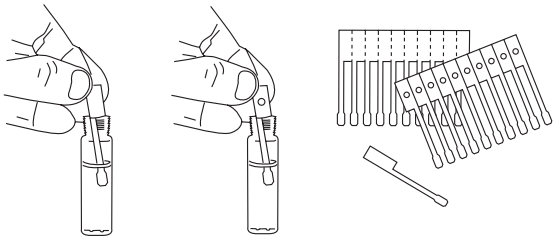
Ordering information

InfinityLab EasiCal pre-prepared polystyrene kits

Polystyrene PS-1 Part No. PL2010-0501 (1/pk) Part No. PL2010-0505 (5/pk)	Polystyrene PS-2 Part No. PL2010-0601 (1/pk) Part No. PL2010-0605 (5/pk)
Spatula A, Constituent Polymers Nominal Mp (g/mol)	
3,000	1,300
30,000	5,000
130,000	20,000
700,000	100,000
7,000,000	400,000
Spatula B, Constituent Polymers Nominal Mp (g/mol)	
580	580
10,000	3,000
70,000	10,000
300,000	50,000
2,500,000	200,000

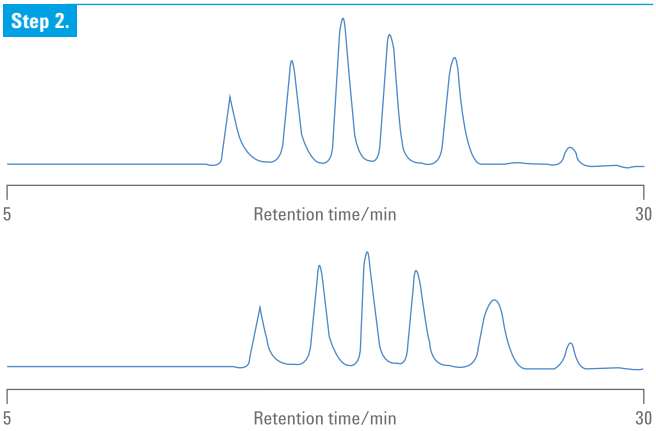
Column calibration for GPC/SEC is as easy as 1, 2, 3...

Step 1.



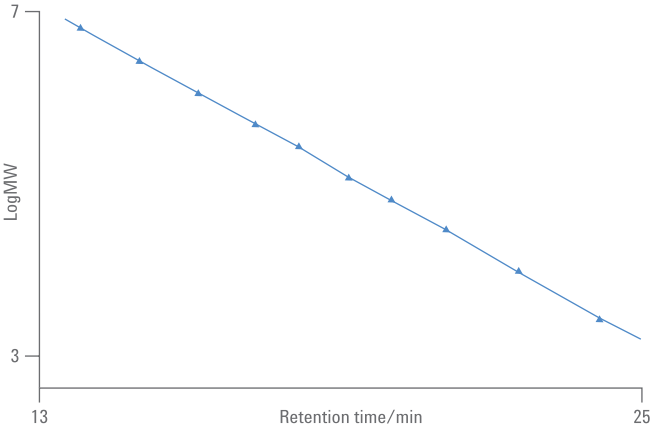
Place one spatula of each type into appropriate volume of solvent

Step 2.



Chromatograph each solution, only two injections required

Step 3.



Generate a 10 point calibration curve

POLYSTYRENE STANDARDS

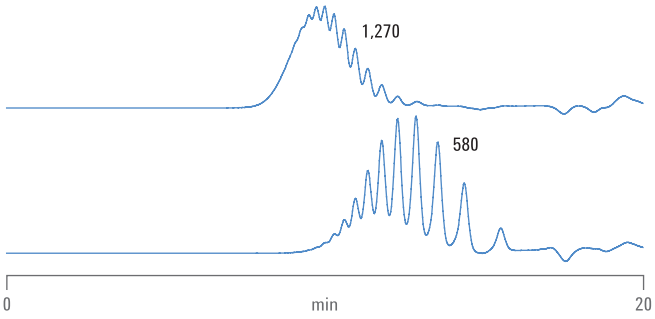
The first choice standard for most organic applications

- Compatible with most organic solvents
- Certificate of Analysis meets international protocols
- Widest range of available MW standards for organic solvents

Polystyrene standards are the first choice for many organic solvents for conventional GPC column calibration, and light scattering detectors and viscometers.

The Agilent polystyrene standards cover a MW range from 162 to 15 million g/mol, with MW standards selected to provide equidistant calibration points for greater accuracy.

Conditions
Columns: 2 x InfinityLab OligoPore, 7.5 x 300 mm
Eluent: THF
Flow Rate: 1.0 mL/min
Detector: PL-GPC 50 (DRI)



Polystyrene standards

Ordering information

Polystyrene individual molecular weights

Polymer Nominal Mp (g/mol)	Nominal Mw/Mn	Part No.
162	1.00	PL2012-1001
370	1.11	PL2012-0001
580	1.11	PL2012-2001
1,000	1.09	PL2012-3001
1,300	1.07	PL2012-4001
2,000	1.05	PL2012-5001
3,000	1.04	PL2012-6001
5,000	1.03	PL2012-7001
7,000	1.04	PL2012-8001
10,000	1.02	PL2012-9001
20,000	1.02	PL2013-1001
30,000	1.02	PL2013-2001
50,000	1.03	PL2013-3001
70,000	1.03	PL2013-4001
100,000	1.02	PL2013-5001
130,000	1.01	PL2013-6001
200,000	1.05	PL2013-7001
300,000	1.03	PL2013-8001
500,000	1.03	PL2013-9001
700,000	1.03	PL2014-0001
1,000,000	1.05	PL2014-1001
1,500,000	1.04	PL2014-2001
2,000,000	1.04	PL2014-3001
2,500,000	1.05	PL2014-4001
4,000,000	1.04	PL2014-6001
7,000,000	1.04	PL2014-7001
10,000,000	1.06	PL2014-8001
15,000,000	1.05	PL2014-9001

Part numbers are given for 1 g quantities. (Part numbers for 5 g and 10 g quantities are obtained by replacing the last two digits, 01, with 05 or 10, respectively).

POLYSTYRENE STANDARDS

Ordering information

Polystyrene calibration kits, (all kits 10 x 0.5 g)

S-H-10 Part No. PL2010-0103	S-H2-10 Part No. PL2010-0104	S-M-10 Part No. PL2010-0100	S-M2-10 Part No. PL2010-0102	S-L-10 Part No. PL2010-0101	S-L2-10 Part No. PL2010-0105
Constituent Polymer Nominal Mp (g/mol)					
300,000	1,000	580	580	162	162
500,000	3,000	1,300	1,300	370	370
700,000	10,000	5,000	3,000	580	580
1,000,000	30,000	10,000	5,000	1,000	1,000
2,000,000	70,000	30,000	10,000	2,000	1,300
3,000,000	200,000	70,000	20,000	3,000	2,000
4,000,000	700,000	200,000	30,000	5,000	3,000
7,000,000	2,000,000	500,000	70,000	7,000	5,000
10,000,000	4,000,000	1,000,000	130,000	13,000	7,000
15,000,000	15,000,000	3,000,000	300,000	20,000	10,000

POLYMETHYLMETHACRYLATE STANDARDS

Extreme versatility in solvent choice

- Solubility range across wide range of nonpolar and polar organic solvents
- First choice for calibration in polar organic solvents
- Certificate of analysis meets international protocols

Polymethylmethacrylate (PMMA) standards are available as a secondary standard option for organic solvents and as the preferred standard for polar organics such as DMSO, DMAc, DMF, and HFIP.

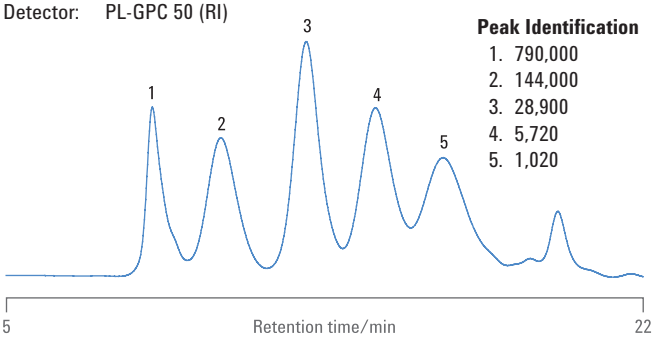
The MWs of these standards are selected to provide equidistant calibration points for greater accuracy, covering MWs of 600 to 1.5 million g/mol.

See also

InfinityLab EasiVial calibration kit, pre-weighed to save time, page 5 Organic GPC/SEC columns, publication 5990-7994EN
Aqueous and polar GPC/SEC columns, publication 5990-7995EN

Conditions

Columns: 2 x PL HFIPgel, 7.5 x 300 mm
Eluent: HFIP + 20 mM NaTFAc
Flow Rate: 1.0 mL/min
Temp: 40 °C
Detector: PL-GPC 50 (RI)



Peak Identification

1. 790,000
2. 144,000
3. 28,900
4. 5,720
5. 1,020

Agilent Polymethylmethacrylate standards

POLYMETHYLMETHACRYLATE STANDARDS

Ordering information

Polymethylmethacrylate calibration kits, (all kits 10 x 0.5 g)

M-L-10 Part No. PL2020-0100	M-M-10 Part No. PL2020-0101
Constituent Polymer Nominal Mp (g/mol)	
500	1,000
1,000	2,000
2,000	5,000
3,000	10,000
5,000	30,000
7,000	70,000
10,000	130,000
20,000	300,000
30,000	700,000
50,000	1,500,000

Polymethylmethacrylate individual molecular weights

Polymer Nominal Mp (g/mol)	Nominal Mw/Mn	Part No.
500	1.19	PL2022-2001
1,000	1.26	PL2022-3001
2,000	1.08	PL2022-5001
3,000	1.08	PL2022-6001
5,000	1.09	PL2022-7001
7,000	1.08	PL2022-8001
10,000	1.03	PL2022-9001
13,000	1.03	PL2023-0001
20,000	1.03	PL2023-1001
30,000	1.02	PL2023-2001
50,000	1.02	PL2023-3001
70,000	1.02	PL2023-4001
100,000	1.02	PL2023-5001
130,000	1.05	PL2023-6001
200,000	1.02	PL2023-7001
300,000	1.02	PL2023-8001
500,000	1.06	PL2023-9001
700,000	1.03	PL2024-0001
1,000,000	1.09	PL2024-1001
1,500,000	1.09	PL2024-2001

Part numbers are given for 1 g quantities. (Part numbers for 5 g and 10 g quantities are obtained by replacing the last two digits, 01, with 05 or 10, respectively).

POLYETHYLENE GLYCOL/OXIDE STANDARDS

Use with aqueous and organic solvents

- Preferred standard for aqueous and polar protic solvents such as methanol
- Uncharged polymer prevents interaction with a wide range of particles
- MWs selected to provide equidistant calibration points for greater accuracy

Polyethylene glycol/oxide standards are the primary choice for calibration in water, water mixtures, and protic solvents such as methanol.

The MW of these standards is selected to provide equidistant calibration points for greater accuracy, covering MWs of 106 to 1.5 million g/mol.

See also

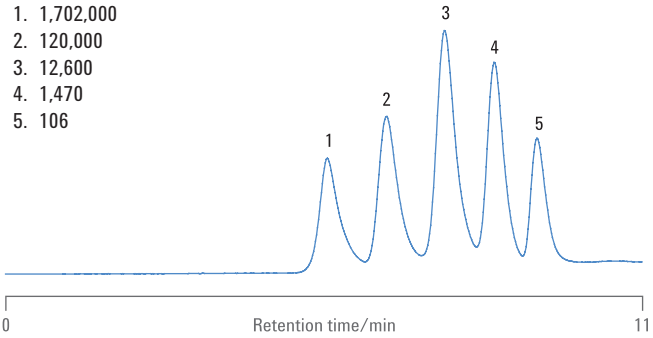
InfinityLab EasiVial calibration kit, pre-weighed to save time, page 5Organic GPC/SEC columns, publication 5990-7994EN
Aqueous and polar GPC/SEC columns, publication 5990-7995EN

Conditions

Column: PL aquagel-OH MIXED 8 µm, 7.5 x 300 mm
Eluent: Water
Flow rate: 1.0 mL/min
Detector: PL-GPC 50 (RI)

Peak Identification

1. 1,702,000
2. 120,000
3. 12,600
4. 1,470
5. 106



Agilent Polyethylene glycol/oxide standards

POLYETHYLENE GLYCOL/OXIDE STANDARDS

Ordering information

Polyethylene glycol/oxide calibration kits

PEG-10 (10 x 0.5 g) Part No. PL2070-0100	PEO-10 (10 x 0.2 g) Part No. PL2080-0101
Constituent Polymer Nominal Mp (g/mol)	
106	20,000
194	30,000
400	50,000
600	70,000
1,000	130,000
1,500	200,000
4,000	300,000
7,000	500,000
13,000	700,000
20,000	1,000,000

Polyethylene glycol/oxide individual molecular weights

Polymer Nominal Mp (g/mol)	Nominal Mw/Mn	Part No.
106	1	PL2070-1001
194	1	PL2070-2001
238	1	PL2071-2001
282	1	PL2071-3001
420	1.09	PL2070-3001
600	1.06	PL2070-4001
1,000	1.04	PL2070-5001
1,500	1.04	PL2070-6001
4,000	1.03	PL2070-7001
7,000	1.04	PL2070-8001
10,000	1.05	PL2070-9001
13,000	1.07	PL2071-0001
20,000	1.07	PL2071-1001
20,000	1.05	PL2083-1001
30,000	1.07	PL2083-2001
50,000	1.05	PL2083-3001
70,000	1.05	PL2083-4001
100,000	1.06	PL2083-5001
130,000	1.07	PL2083-6001
200,000	1.07	PL2083-7001
300,000	1.07	PL2083-8001
500,000	1.06	PL2083-9001
700,000	1.07	PL2084-0001
1,000,000	1.12	PL2084-1001
1,500,000	1.13	PL2084-2001

Part numbers are given for 1 g quantities. (Part numbers for 5 g and 10 g quantities are obtained by replacing the last two digits, 01, with 05 or 10, respectively).

POLYACRYLIC ACID STANDARDS

Aqueous calibration standards with a chromophore

- Detectable by UV/Vis
- Aqueous polymers 1,000–2,000,000 g/mol MW
- Anionic polymer

Ordering information

Polyacrylic Acid - Na salt calibration kit

PAA-10 (all kits 10 x 0.2 g)
Constituent Polymer Nominal Mp (g/mol)
1,000
3,000
7,000
13,000
30,000
70,000
100,000
300,000
700,000
1,000,000

Polyacrylic Acid - Na salt, individual molecular weights (0.2 g)

Polymer Nominal Mp (g/mol)	Part No.
1,000	PL2142-3000
1,000	PL2142-3001
2,000	PL2142-5000
3,000	PL2142-6000
3,000	PL2142-6001
5,000	PL2142-7000
5,000	PL2142-7001
7,000	PL2142-8000
7,000	PL2142-8001
13,000	PL2143-0000
30,000	PL2143-2000
30,000	PL2143-2001
50,000	PL2143-3000
50,000	PL2143-3001
70,000	PL2143-4000
70,000	PL2143-4001
100,000	PL2143-5000
100,000	PL2143-5001
130,000	PL2143-6000
130,000	PL2143-6001
200,000	PL2143-7000
200,000	PL2143-7001
300,000	PL2143-8000
300,000	PL2143-8001
500,000	PL2143-9000
500,000	PL2143-9001
700,000	PL2144-0000
1,000,000	PL2144-1000
1,000,000	PL2144-1001
1,500,000	PL2144-2001
2,000,000	PL2144-3000
2,000,000	PL2144-3001

TECHNIQUE REVIEW

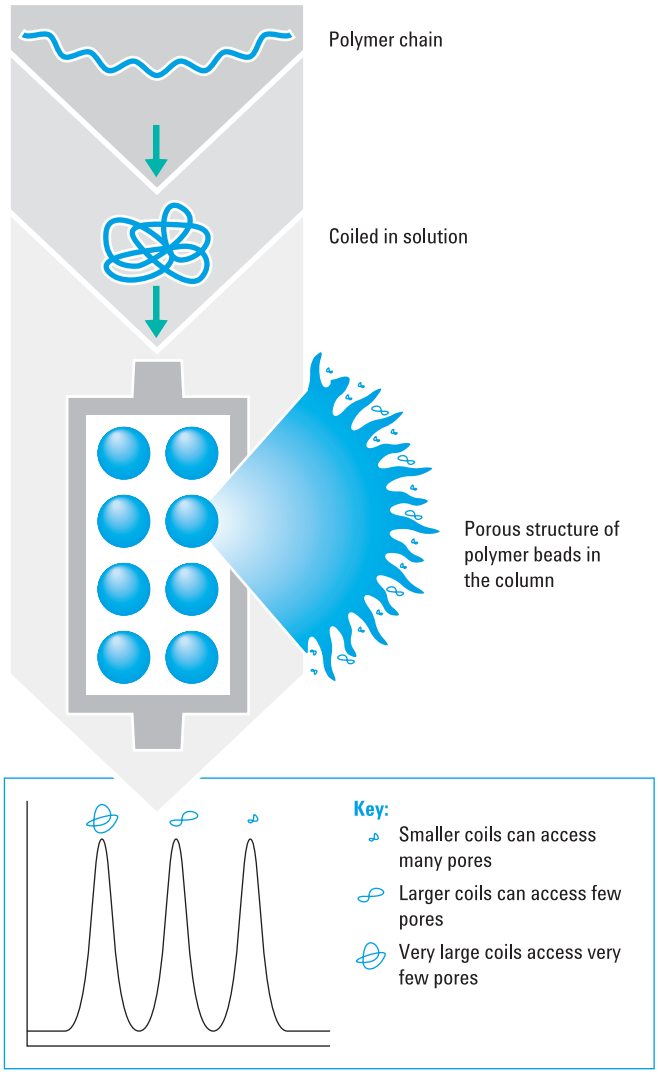
Gel permeation chromatography (GPC) and size exclusion chromatography (SEC) are liquid chromatographic techniques that separate individual polymer chains based on their size in solution.

GPC and SEC are techniques for measuring the molecular weight (MW) distribution of natural and synthetic polymers. The MW distribution affects many of the physical parameters of these materials such as strength, toughness, and chemical resistance.

GPC is used to describe the analysis of polymers in organic solvents, such as tetrahydrofuran. Alternatively SEC is used to describe the analysis of polymers in water and water-based solvents, such as buffer solutions. GPC and SEC are the only established methods for obtaining a comprehensive understanding of the MW distribution of a polymer.

The mechanism of GPC and SEC

1. Polymer molecules are dissolved in solution to form spherical coils, the size of which depend on the MW.
2. These polymer coils are then introduced to the eluent flowing through a column.
3. These columns are packed with insoluble porous beads that have a well-defined pore structure.
4. The size of the pores on the beads is similar to that of polymer coils.
5. The polymer coils can therefore diffuse in and out of the pores.
6. This results in the elution of polymers based on size – large coils elute first as they cannot fit in as many pores, and smaller coils elute last.
7. This size separation can then be used to calculate molecular weight by the use of a calibration curve constructed using of polymer standards.



Mechanism of gel permeation chromatography/size exclusion chromatography (GPC/SEC)

When to calibrate

Small shifts in retention time can cause large inaccuracies in measured molecular weight. Common sources of retention time shifts are:

- New connections
- Column aging
- Replaced parts
- Pump flow stability

Best practice is to calibrate at the beginning and end of a sample set, before data is analyzed. This practice catches inaccuracies early, minimizing the number of samples that potentially need to be rerun.

At minimum, a system should be calibrated at startup, and weekly thereafter.

For more information, refer to *"Calibrating GPC columns: A Guide to Best Practice,"* publication 5991-2720EN.

What standards should I use?

Question	Answer	Recommendation	Comments
1. What is the eluent? *Standards are polymers, so the choice of standard mainly reflects solubility in the chosen eluents.*	Water or water buffer with up to 50% methanol	**Polyethylene glycol/oxide (PEG/PEO)** or **Polyacrylic acid**	These standards perform in all water-based systems in convenient InfinityLab EasiVial format
	Typical organic solvent such as THF, chloroform, toluene	**Polystyrene (PS)** or **polymethylmethacrylate (PMMA)**	Polystyrene is the most commonly used standard in convenient InfinityLab EasiVial format
	Polar organics such as DMF, DMSO, NMP	**Polymethylmethacrylate (PMMA)** or **Polyethylene glycol/oxide (PEG/PEO)**	Polymethylmethacrylate is soluble in various polar organic solvents and is available in InfinityLab EasiVial format
Question	**Answer**	**Recommendation**	**Comments**
2. What format of standards are recommended? *Different formats of standards are available depending on customer preference.*	For general calibration curve generation in a laborsaving format	**InfinityLab EasiVial** or **InfinityLab EasiCal**	InfinityLab EasiVial offers a wider range of polymer types, while InfinityLab EasiCal can be used in any type of vial or container
	If accurate concentrations are required	**InfinityLab EasiVial** or **individual standards**	InfinityLab EasiVials offer an easy pre-weighed option, while individual standards are available in larger quantities for concentrated solutions and custom combinations

AGILENT PUBLICATIONS

Further reading

GPC/SEC publication	Publication number
Primers	
An introduction to gel permeation chromatography and size exclusion chromatography	5990-6969EN
Calibrating GPC/SEC columns - a guide to best practice	5991-2720EN
Step-by-step method development in GPC	5991-7272EN
Polymer-to-solvent reference Ttble for GPC/SEC	5991-6802EN
Instrument setup for fast GPC	5991-7191EN
Application compendia	
Analysis of polymers by GPC/SEC - energy & chemicals applications	5991-2517EN
Analysis of polymers by GPC/SEC - food applications	5991-2029EN
Analysis of polymers by GPC/SEC - pharmaceutical applications	5991-2519EN
Excipient analysis by GPC/SEC and other LC techniques	5990-7771EN
Biodegradable polymers - analysis of biodegradable polymers by GPC/SEC	5990-6920EN
Analysis of engineering polymers by GPC/SEC	5990-6970EN
Analysis of elastomers by GPC/SEC	5990-6866EN
Analysis of polyolefins by GPC/SEC	5990-6971EN
Low molecular weight resins - Analysis of low molecular weight resins and prepolymers by GPC/SEC	5990-6845EN
Product guides	
Aqueous and polar GPC/SEC columns	5990-7995EN
Organic GPC/SEC columns	5990-7994EN

AGILENT GPC/SEC ANALYSIS SYSTEMS

The Agilent 1260 Infinity II GPC/SEC system and 1260 Infinity II Multi-Detector GPC/SEC system are part of Agilent InfinityLab, an optimized portfolio of LC instruments, columns and supplies that work together seamlessly for maximum efficiency and performance.

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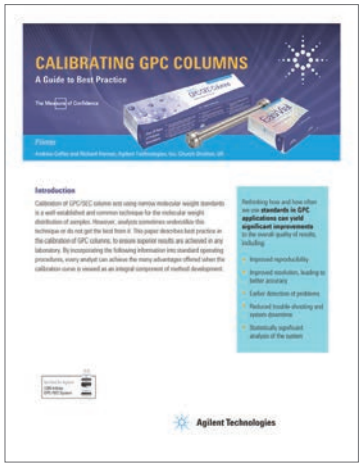

Calibration is key to generating reliable and accurate GPC data. To learn more, refer to the primer:

Calibrating GPC Columns—A Guide to Best Practice
Publication 5991-2720EN

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