

# Polymer Standards

**Individual Standards and Calibration kits:** Manufactured by Polymer Standards Service GMBH, under **ISO 9001 certification**, these high quality reference materials are accompanied by a **Quality Certificate** with **Mw distribution and GPC traces (Mp, Mn, Mw)**. For stringent **DIN ISO and GLP** data requirements, the **DIN Certified Standards** fulfill all requirements of **DIN 55672** and **ISO/EN 13885** standards, providing GPC (relative method) and Light Scattering and/or Viscometry data (absolute methods). All calibration kits are carefully designed to provide equally distributed data points on a calibration curve based on the Mp (using the column specified).

*Call for ordering information on individual Standards*

<b>Calibration Kits- Organics</b>	<b>Molecular Weight Range (Mp)</b>	<b>Quantity</b>	<b>Cat. No.</b>
Poly(alpha methylstyrene)	1,500- 1,000,000	10 x 1g	<b>PSS-amskit</b>
Poly(butadiene-1,4)	1,000 - 1,000,000	10 x 1g	<b>PSS-bdkit</b>
Poly(t-butyl vinylketone)	10,000 - 450,000	5 x 0.1g	<b>PSS-bvkkkit</b>
Poly(ethyl methacrylate)	2,000 - 500,000	10 x 1g	<b>PSS-emkit</b>
Poly(iso-butylene)	100 - 1,000,000	10 x 0.5g	<b>PSS-pibkit</b>
<b>Poly(methyl methacrylate) DIN</b>	100 - 1,000,000	12 x 1g	<b>PSS-mmkitd</b>
Poly(methyl methacrylate)	100 - 1,000,000	12 x 1g	<b>PSS-mmkitd</b>
Poly(methyl methacrylate)	100 - 30,000	6 x 1g	<b>PSS-mmkitl</b>
Poly(n-butylacrylate)	700 - 80,000	8 x 0.1g	<b>PSS-nbakit</b>
Poly(n-butyl methacrylate)	1,500 - 800,000	9 x 1g	<b>PSS-nbkit</b>
Nylon 6,6 (broad MWD)	18,000 - 70,000	7 x 0.25g	<b>PSS-nsskit</b>
Oligo(ethylene), linear	112 - 2,200	8 x 0.5g	<b>PSS-oeokit</b>
Poly(carbonate)	500 - 180,000	8 x 0.5g	<b>PSS-pckit</b>
Poly(dimethylsiloxane)	400 - 300,000	8 x 0.5g	<b>PSS-pdmkit</b>
Poly(ethylene)	100 - 170,000	10 x 0.25g	<b>PSS-pekit</b>
Poly(isoprene -1,4)	1,000 - 800,000	10 x 1g	<b>PSS-piokit</b>
<b>Poly(styrene) Din Certified</b>	200 - 2,000,000	12 x 1g	<b>PSS-pskitd</b>
Poly(styrene)	400 - 3,000,000	12 x 1g	<b>PSS-pskitd</b>
Poly(styrene)	100 - 20,000	8 x 1g	<b>PSS-pskitl</b>
Poly(vinylpyridine)	1,000 - 300,000	8 x 1g	<b>PSS-pvpkkit</b>
Poly(t-butyl methacrylate)	600 - 1,000,000	10 x 1g	<b>PSS-tbkit</b>

## Calibration Kits -Water Soluble Polymers

Poly(methacryl. acid) Na salt	1,000 - 1,000,000	10 x 1g	<b>PSS-pmakit</b>
Poly(vinyl alcohol) (broad)	5,000 - 140,000	8 x 1g	<b>PSS-pvokit</b>
Poly(styrene sulfonate) Na salt	4,000 - 1,000,000	10 x 1g	<b>PSS-psskit</b>
Poly(acrylic acid) Na salt	1,700 - 1,100,000	10 x 0.25g	<b>PSS-paakit</b>
Poly(ethylene glycol)	100 - 40,000	10 x 1g	<b>PSS-pegkit</b>
<b>Poly(ethylene glycol) DIN</b>	100 - 40,000	10 x 1g	<b>PSS-pegkitd</b>
Poly(ethylene oxide)	20,000 - 1,700,000	8 x 0.5g	<b>PSS-peokit</b>
Poly(propylene glycol)	80 - 5,000	7 x 1g	<b>PSS-ppgkit</b>
Dextran (Polysaccharide)	180 - 300,000	10 x 0.5g	<b>PSS-dxtkit</b>
<b>Dextran DIN Certified</b>	180 - 300,000	10x 0.5g	<b>PSS-dxtkitd</b>
Pullulan	5,000 - 800,000	8 x 0.2g	<b>PSS-pulkitl</b>
Pullulan	300 - 800,000	10 x 0.2g	<b>PSS-pulkitd</b>

## ReadyCal Kits: Complete 12 point calibration curves (four std. per vial) already weighed in 1.5 ml or 4ml autosampler vials

Poly(styrene) ReadyCal 1.5ml	400 - 3,000,000	10x3 vials	<b>PSS-pskitr1</b>
Poly(styrene) ReadyCal 1.5 Low	162 - 70,000	10x3 vials	<b>PSS-pskitr1l</b>
Poly(styrene) ReadyCal <sup>1.5</sup> High	1,500 - 6,500,000	10x3 vials	<b>PSS-pskitr1h</b>
PMMA ReadyCal™ 1.5	500 - 3,000,000	10x3 vials	<b>PSS-mmkitr1</b>
PEO/PEG ReadyCal™	200 - 1,200,000	10x3 vials	<b>PSS-peokitr1</b>

## Light Scattering/Viscometry Validation Kits

Poly(styrene)	9,000 - 800,000	4 x 0.5g	<b>PSS-pskitv</b>
Poly(methyl methacrylate)	8,000 - 1,100,000	4x 0.5g	<b>PSS-mmkitv</b>
Dextrane	10,000 - 230,000	4x 0.5g	<b>PSS-dxtkitv</b>

## MALDI-Validation Kits: Different molecular weights to determine resolution and polarities for matrix-sample compatibility

Poly(styrene)	500 - 70,000	6 x 0.5g	<b>PSS-pskitm</b>
Poly(methyl methacrylate)	500- 70,000	6x 0.5g	<b>PSS-mmkitm</b>
Poly(ethylene glycol)	500- 20,000	6x 0.5g	<b>PSS-pegkitm</b>
Mix (PS,PMMA,PDMS,PEG,PSS)	5,000- 20,000	5x 0.5g	<b>PSS-mixkitm</b>
Poly(styrene)	9,000 - 800,000	4 x 0.5g	<b>PSS-pskitv</b>

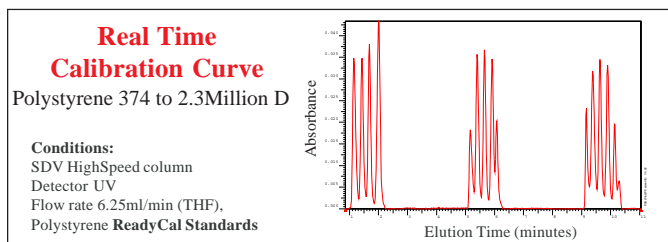
# PSS High Speed GPC Columns

- ASTM D5296-97 compliant
- Rapid sample throughput (up to 10 times faster)
- Rapid product screening
- “Just in time” process control
- Rapid 2D-chromatography

The PSS HighSpeed family of columns permits dramatic **reductions in GPC analysis time** for polymers > **2000D**, without loss in resolution, accuracy or reproducibility. PSS HighSpeed columns (**20mmx50mm**) have a larger diameter and a shorter length than their typical analytical counterparts (8mm x 300mm), and the ability to operate at higher **flow rates up to 6.5 ml/min** while keeping same linear flow, equal resolution and polymer information: **Mw, Mn, Mp and PDI**. They have unparalleled ability to produce a **12 point calibration curve in just ten minutes; (Polystyrene 374 to 2.3 Million D)**. Optimum column design helps expedite product screening, process control, and rapid sample throughput.

**Durability:** PSS HighSpeed Columns contain a very stable material modification that allows long term use without observable loss of efficiency.

**Stability:** PSS HighSpeed Columns are stable at pressures up to 150 bar for small pore HighSpeed and up to 45 bar for large pore HighSpeed. They can be used at room temperature or up to 80° C (Avoid boiling of eluent in the column). Aqueous columns are stable at pH 1.5 - 12. Organic columns are long term stable in the solvent they are shipped in.



High Speed Column Separation Range				
Porosity	SDV	Suprema	Novema	Gram
30Å	-	100 - 2 x 10e4 D	100 - 3 x 10e4	100 - 1 x 10e4 D
50Å	100 - 3 x 10e3 D	-	-	-
100Å	100 - 6 x 10e3 D	100 - 6 x 10e4 D	100 - 2 x 10e5	300 - 6 x 10e4 D
500Å	100 - 2.5 x 10e4 D	-	-	-
1000Å	100 - 6 x 10e4 D	10e3 - 1 x 10e6 D	10e3 - 1 x 10e6 D	10e3 - 1 x 10e6 D
3000Å	-	10e3 - 1.6 x 10e6 D	10e3 - > 1.6 x 10e6 D	-
10e4Å	500 - 0.7 x 10e6 D	10e3 - > 5 x 10e6 D	5 x 10e3 - > 5 x 10e6 D	10e3 - > 1 x 10e7
3 x 10e4Å	-	5 x 10e3 - > 10e7 D	-	-
10e5Å	10e3 - 1.5 x 10e6 D	-	-	-
10e6Å	10e3 - 4 x 10e6 D	-	-	-
10e7Å	5 x 10e3 - 6 x 10e6 D	-	-	-
10e8Å	10e4 - > 3 x 10e7 D	-	-	-
linear S	100 - 1.5 x 10e5 D	-	-	-
linear M	100 - 1 x 10e6 D	-	-	-
linear XL	10e3 - 3 x 10e6 D	-	-	-

## PSS High Speed GPC Columns (20 x 50mm)

Phase Type	Cat. No.	Particle size (µm)	Porosity (Å)	
SDV	sds2005031e3	3	1,000	
	sds2005031e4	3	10,000	
	sds2005031e5	3	100,000	
	sds200503lis	3	linear S	
	sds200503lim	3	linear M	
SDV	sds2005051e3	5	1,000	
	sds2005051e4	5	10,000	
	sds2005051e5	5	100,000	
	sds2005051e6	5	1,000,000	
	sds200505lis	5	linear S	
	sds200505lim	5	linear M	
SDV	sds2005101e3	10	1000	
	sds2005101e4	10	10,000	
	sds2005101e5	10	100,000	
	sds2005101e6	10	1,000,000	
	sds2005101e7	10	10,000,000	
	sds2005101e8	10	100,000,000	
	sds200510lis	10	linear S	
	sds200510lim	10	linear M	
	sds200510lxl	10	linear XL	
	SDV	sds2005201e3	20	1000
sds2005201e4		20	10,000	
sds2005201e5		20	100,000	
sds2005201e6		20	1,000,000	
sds2005201e7		20	10,000,000	
sds2005201e8		20	100,000,000	
sds200520lim		20	linear M	
sds200520lxl		20	linear XL	
Suprema		sus2005101e2	10	100
		sus2005101e3	10	1,000
	sus2005101e4	10	10,000	
	sus2005103e3	10	3000	
	sus2005103e4	10	3,0000	
	sus200510lim	10	linear M	
	sus200510lxl	10	linear XL	
Suprema	sus2005201e2	20	100	
	sus2005201e3	20	1,000	
	sus2005201e4	20	10,000	
	sus2005203e3	20	3,000	
	sus2005203e4	20	30,000	
	sus200520lxl	20	linear XL	
Novema	nos2005101e2	10	300	
	nos2005101e3	10	1,000	
	nos2005101e4	10	10,000	
	nos2005103e3	10	3,000	
	nos200510lin	10	linear	
	nos200510lxl	10	linear XL	
GRAM	ams2005101e2	10	100	
	ams2005101e3	10	1,000	
	ams2005101e4	10	10,000	
	ams2005103e3	10	3,000	

HighSpeed Columns	Applicability Example	Eluent
GRAL/GRAM	PMMA, Dextran, Cellulose nitrate	DMF, DMAc, NMP, DMSO
NOVEMA	Polycations, Proteins PolyDADMAC	Aqueous
SDV 3µm	Oligomers	THF, Toluene, CHCl <sub>3</sub>
SDV 5, 10, 20µm	Most organic soluble polymers and co-polymers; PS, PMMA	THF, Toluene, CHCl <sub>3</sub>
SUPREMA	Gelatin, Biopolymers Hyaluronic Acid, Pullulan Xanthane	Aqueous