

Certificate of Analysis



Agilent Technologies, Inc. acquired Polymer Standards Service GmbH (PSS) on August 01st, 2022.

The Quality Certificate / Certificate of Analysis generated by PSS attached to this Letter is valid for the Product stated in the Certificate sold to You by Agilent Technologies, Inc or its subsidiaries.

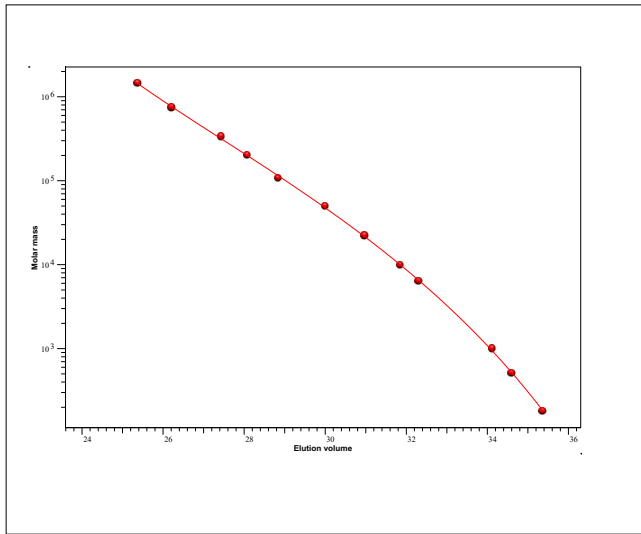
Patrick Kunzweiler

Quality Manager
Liquid Phase Separation Division

Certificate of Analysis

Product: ReadyCal-Kit Pullulan high
 Part No: PSS-PULKITR1H
 Lot No: PULKITR1H-10

GPC/SEC - Calibration Curve



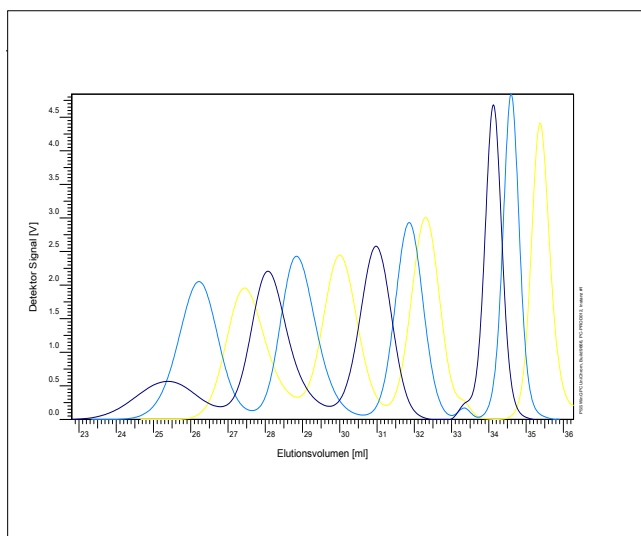
GPC/SEC - Calibration Table

Elution volume [ml]	Mp [Da]	Polymer Lot No:
25,38	1450000	P200321
26,22	739000	P-800-4
27,44	334000	P-400-5
28,08	201000	P-200-4
28,84	107000	P-100-5
30,01	49400	P-50-3
30,98	22000	P-20-3
31,86	9800	P-10-3
32,31	6300	P-5-4
34,12	991	P-0.9
34,61	504	P-0.5
35,37	180	P-0.2

Note:

Mp = Molar mass at the peak maximum

GPC/SEC - Polymer Overlay



GPC/SEC - Calibration Conditions

Solvent	Water, 0.5g/L sodium azide
Flow rate	1,00 ml/min
Precolumn [8 x 50 mm]	PSS SUPREMA 10µm
Columns [8 x 300 mm]	PSS SUPREMA 10µm ultrahigh / ultrahigh / ultrahigh
Temperature	23 °C
Inject volume	20 µl
Internal standard	Ethylene glycol at 36,99 ml
Data Acquisition Software	PSS WinGPC
Calibration by	A.Klein
Fit quality	
Fit-type	PSS Poly 5
R	0,999914

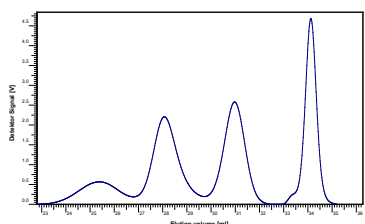
Storage: Store the tightly recapped polymer standards in a dry, dark, cool area; e.g. a refrigerator (4 °C).
 Date of expiry: 2028/02/29 (See also product label.)
 Date of approval: 2023/02/12

Manufacture and control according to PSS method of analysis

J. Preis
 Dr. J. Preis
 production manager

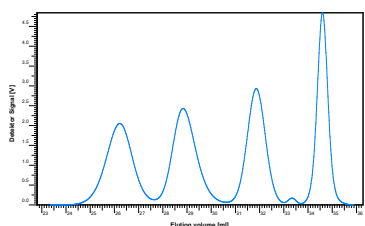
Product: ReadyCal-Kit Pullulan high
 Part No: PSS-PULKITR1H
 Lot No: PULKITR1H-10

Colour code: Cap – dark blue



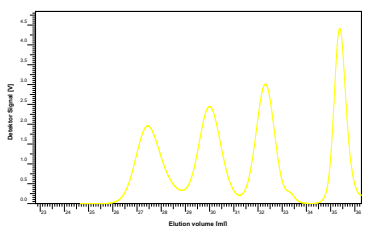
Mp [Da]	Mw [Da]	Mn [Da]	Mw (LS) ^a / Mn (NMR) ^b [Da]	Mass [mg]	Lot No:
1 450 000	1 660 000	982 000	1 520 000 ^a	0.75*	P200321
201 000	202 000	154 000	210 000 ^a	1.50	P-200-4
22 000	23 000	21 300	22 700 ^a	1.50	P-20-3
991	991	991	991 ^b	1.50	P-0.9

Colour code: Cap – light blue



Mp [Da]	Mw [Da]	Mn [Da]	Mw (LS) ^a / Mn (NMR) ^b [Da]	Mass [mg]	Lot No:
739 000	894 000	722 000	847 000 ^a	1.50	P-800-4
107 000	110 000	98 000	112 000 ^a	1.50	P-100-5
9 800	9 900	9 300	10 600 ^a	1.50	P-10-3
504	504	504	504 ^b	1.50	P-0.5

Colour code: Cap – yellow



Mp [Da]	Mw [Da]	Mn [Da]	Mw (LS) ^a / Mn (NMR) ^b [Da]	Mass [mg]	Lot No:
334 000	343 000	264 000	364 000 ^a	1.50	P-400-5
49 400	50 600	46 600	50 400 ^a	1.50	P-50-3
6 300	6 600	6 000	6 700 ^a	1.50	P-5-4
180	180	180	180 ^b	1.50	P-0.2

Polymers stabilized with 2% sodium azide.

For exact determination of sample concentration, we recommend to add the solvent volume precisely.

Level of eluent	full	half	quarter
Volume of eluent	1.5 ml	0.75 ml	0.375 ml
Concentration	1 g/l resp. 0.5 g/l*	2 g/l resp. 1 g/l*	4 g/l resp. 2 g/l*