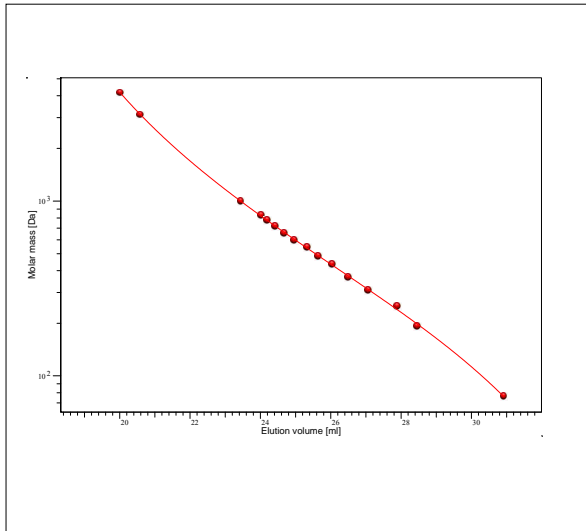


Certificate of Analysis

Product: Kit Poly(propylene glycol)
 Part No: PSS-ppgkit
 Lot No: ppgkit-03

GPC/SEC - Calibration Curve



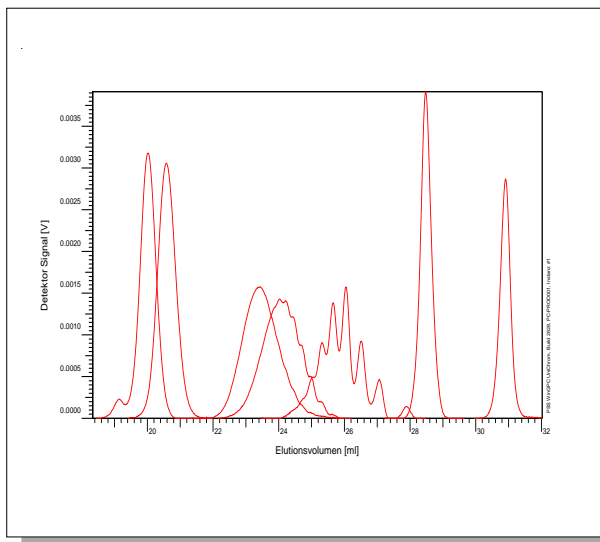
GPC/SEC - Calibration Table

Elution volume [ml]	Mp [Da]	Polymer Lot No:	Polymer Part No:
20,03	4150	ppg231014	PSS-ppg4.5k
20,58	3110	ppg241014	PSS-ppg3k
23,45	999	ppg251014	PSS-ppg1k
24,03	830	ppg261014	PSS-ppg790
24,21	775	ppg261014	PSS-ppg790
24,43	714	ppg261014	PSS-ppg790
24,68	656	ppg261014	PSS-ppg790
24,98	598	ppg261014	PSS-ppg790
25,33	540	ppg271014	PSS-ppg450
25,66	482	ppg271014	PSS-ppg450
26,05	435	ppg271014	PSS-ppg450
26,51	366	ppg271014	PSS-ppg450
27,06	308	ppg271014	PSS-ppg450
27,90	250	ppg271014	PSS-ppg450
28,48	192	ppg192	PSS-ppg192
30,93	76	ppg76	PSS-ppg76

Note:

Mp = Molar mass at the peak maximum

GPC/SEC - Polymer Overlay



GPC/SEC - Calibration Conditions

Solvent	Tetrahydrofuran
Flow rate	1,00 ml/min
Precolumn [8 x 50 mm]	PSS SDV 3µm
Columns [8 x 300 mm]	PSS SDV 3µm 50Å / 100Å / 100Å
Temperature	23 °C
Inject volume	20 µl
Internal standard	Toluene at 33,36 ml
Data Acquisition Software	PSS WinGPC
Calibration by	J.Preis

Fit quality

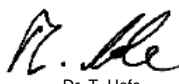
Fit-type	PSS Poly 5
R	0,999867

Storage: Store the tightly recapped polymer standards in a dry, dark, cool area; e.g. a refrigerator (4 °C).

Date of expiry: yyyy/mm/dd (See also product label.)

Date of approval: yyyy/mm/dd

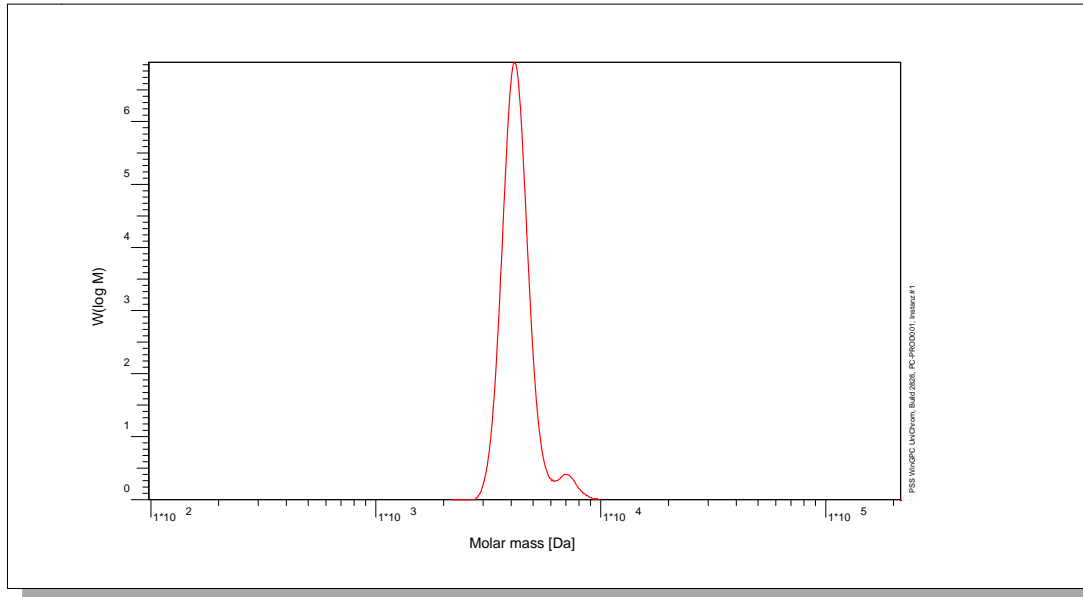
Manufacture control according to PSS method of analysis


 Dr. T. Hofe
 production director

Certificate of Analysis

Polymer type: Poly(propylene glycol)
 Part No: PSS-ppg4.5k
 Lot No: ppg231014

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	1,00 g/l	Inject volume	20 µl
Solvent	Tetrahydrofuran	Flow rate	1,00 ml/min
Precolumn [8 x 50 mm]	PSS SDV 3µm	Temperature	23 °C
Columns [analytical, each 8 x 300 mm]	PSS SDV 3µm 50Å / 100Å / 100Å		
Data Acquisition Software	PSS WinGPC	Operator	J.Preis

GPC/SEC - Results

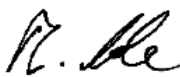
Detector	Mw [Da]	Mn [Da]	Mp [Da]	PDI [Mw/Mn]
PSS SECcurity RI	4340	4220	4150	1,03

Note:

Mw = Weight average molecular weight
 Mn = Number average molecular weight
 Mp = Molar mass at the peak maximum
 PDI = Polydispersity Index

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. a refrigerator (4 °C).
Date of expiry: yyyy/mm/dd (See also product label.)
Date of approval: yyyy/mm/dd

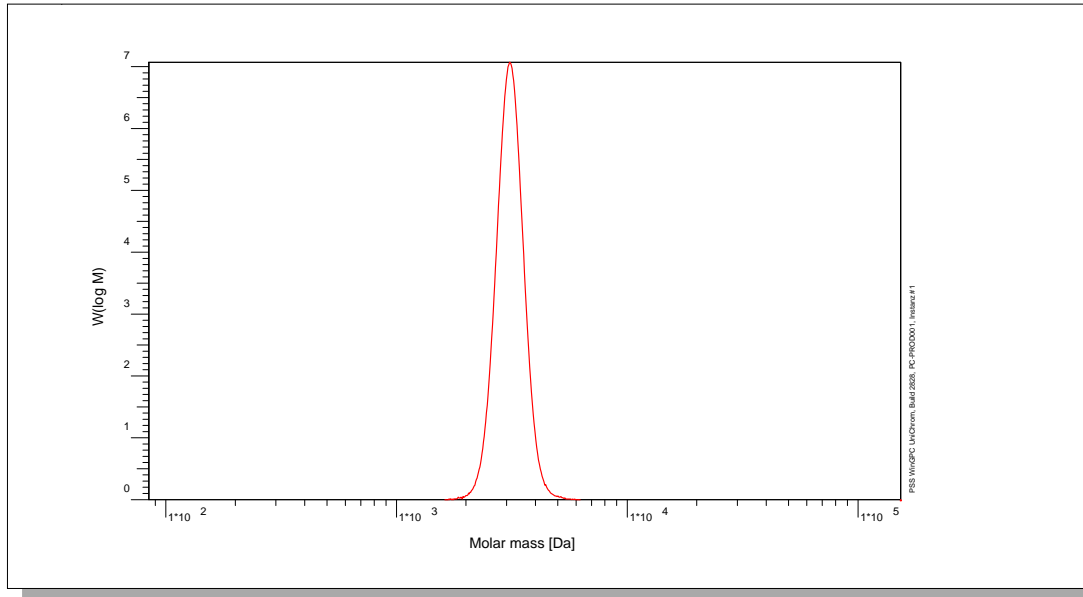
Manufacture control according to PSS method of analysis


 Dr. T. Hofe
 production director

Certificate of Analysis

Polymer type: Poly(propylene glycol)
 Part No: PSS-ppg3k
 Lot No: ppg241014

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	1,00 g/l	Inject volume	20 µl
Solvent	Tetrahydrofuran	Flow rate	1,00 ml/min
Precolumn [8 x 50 mm]	PSS SDV 3µm	Temperature	23 °C
Columns [analytical, each 8 x 300 mm]	PSS SDV 3µm 50Å / 100Å / 100Å		
Data Acquisition Software	PSS WinGPC	Operator	J.Preis

GPC/SEC - Results

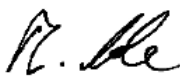
Detector	Mw [Da]	Mn [Da]	Mp [Da]	PDI [Mw/Mn]
PSS SECcurity RI	3130	3070	3110	1,02

Note:

Mw = Weight average molecular weight
 Mn = Number average molecular weight
 Mp = Molar mass at the peak maximum
 PDI = Polydispersity Index

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. a refrigerator (4 °C).
Date of expiry: yyyy/mm/dd (See also product label.)
Date of approval: yyyy/mm/dd

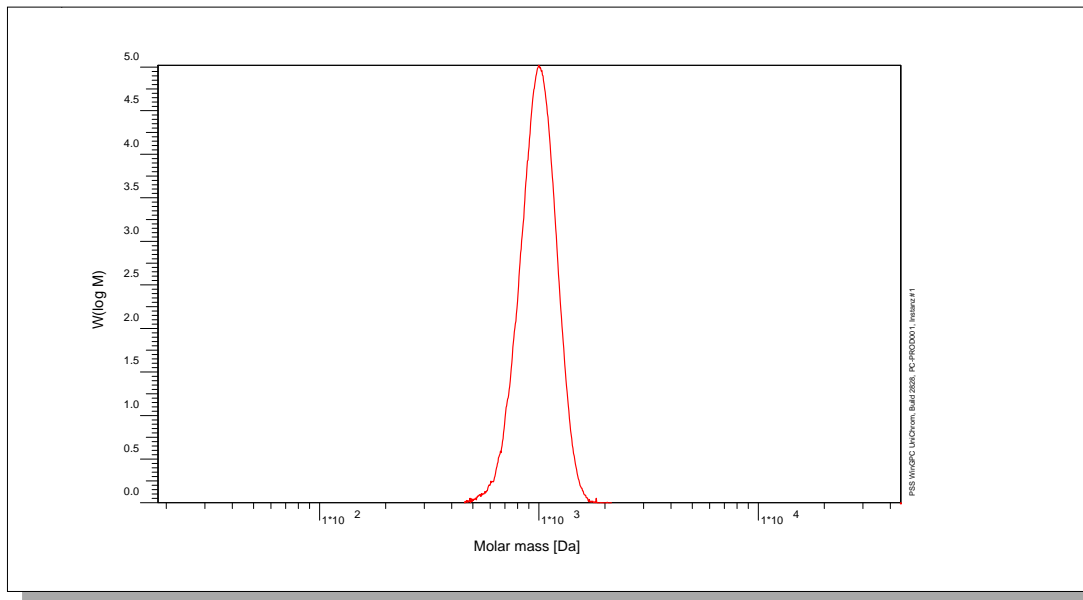
Manufacture control according to PSS method of analysis


 Dr. T. Hofe
 production director

Certificate of Analysis

Polymer type: Poly(propylene glycol)
 Part No: PSS-ppg1k
 Lot No: ppg251014

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	1,00 g/l	Inject volume	20 µl
Solvent	Tetrahydrofuran	Flow rate	1,00 ml/min
Precolumn [8 x 50 mm]	PSS SDV 3µm	Temperature	23 °C
Columns [analytical, each 8 x 300 mm]	PSS SDV 3µm 50Å / 100Å / 100Å		
Data Acquisition Software	PSS WinGPC	Operator	J.Preis

GPC/SEC - Results

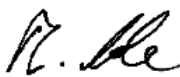
Detector	Mw [Da]	Mn [Da]	Mp [Da]	PDI [Mw/Mn]
PSS SECcurity RI	1010	972	999	1,04

Note:

Mw = Weight average molecular weight
 Mn = Number average molecular weight
 Mp = Molar mass at the peak maximum
 PDI = Polydispersity Index

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. a refrigerator (4 °C).
Date of expiry: yyyy/mm/dd (See also product label.)
Date of approval: yyyy/mm/dd

Manufacture control according to PSS method of analysis

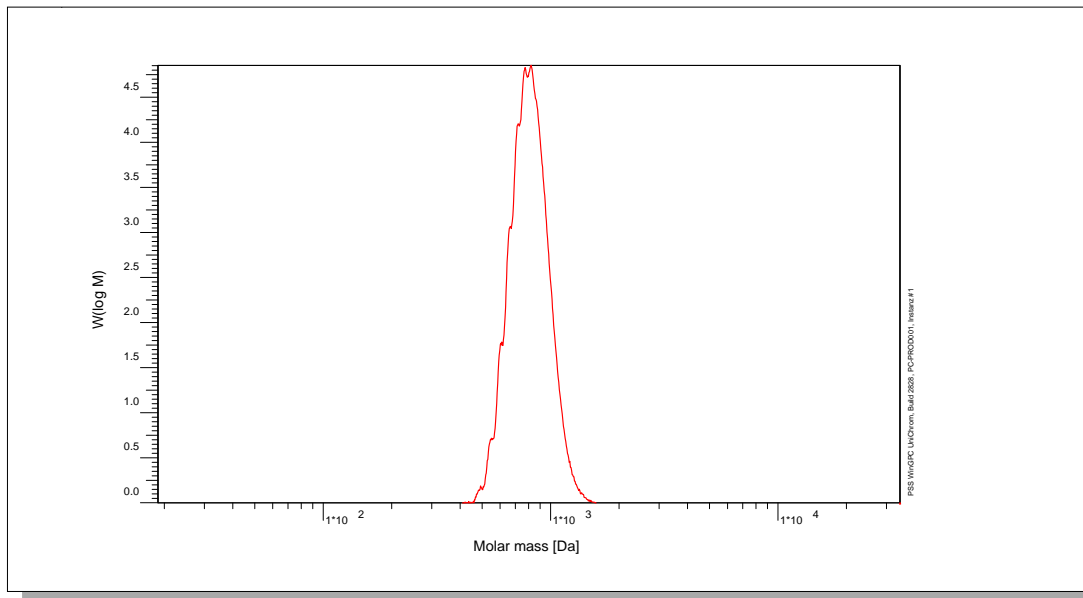

 Dr. T. Hofe
 production director



Certificate of Analysis

Polymer type: Poly(propylene glycol)
 Part No: PSS-ppg790
 Lot No: ppg261014

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	1,00 g/l	Inject volume	20 µl
Solvent	Tetrahydrofuran	Flow rate	1,00 ml/min
Precolumn [8 x 50 mm]	PSS SDV 3µm	Temperature	23 °C
Columns [analytical, each 8 x 300 mm]	PSS SDV 3µm 50Å / 100Å / 100Å		
Data Acquisition Software	PSS WinGPC	Operator	J.Preis

GPC/SEC - Results

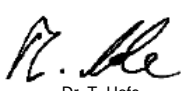
Detector	Mw [Da]	Mn [Da]	Mp [Da]	PDI [Mw/Mn]
PSS SECcurity RI	817	789	830	1,04

Note:

Mw = Weight average molecular weight
 Mn = Number average molecular weight
 Mp = Molar mass at the peak maximum
 PDI = Polydispersity Index

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. a refrigerator (4 °C).
Date of expiry: yyyy/mm/dd (See also product label.)
Date of approval: yyyy/mm/dd

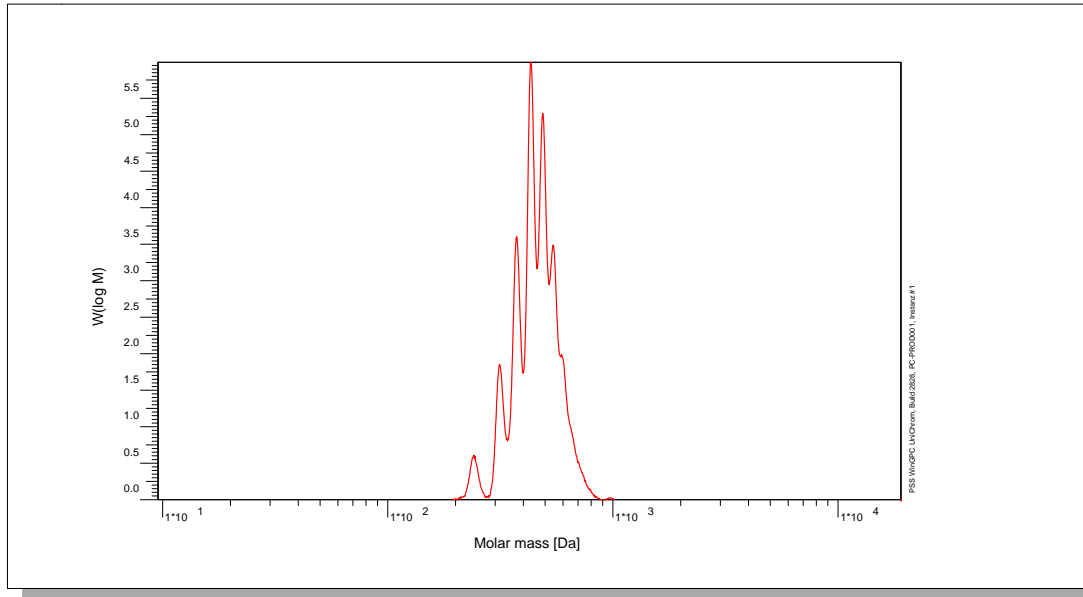
Manufacture control according to PSS method of analysis


 Dr. T. Hofe
 production director

Certificate of Analysis

Polymer type: Poly(propylene glycol)
 Part No: PSS-ppg450
 Lot No: ppg271014

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	1,00 g/l	Inject volume	20 µl
Solvent	Tetrahydrofuran	Flow rate	1,00 ml/min
Precolumn [8 x 50 mm]	PSS SDV 3µm	Temperature	23 °C
Columns [analytical, each 8 x 300 mm]	PSS SDV 3µm 50Å / 100Å / 100Å		
Data Acquisition Software	PSS WinGPC	Operator	J.Preis

GPC/SEC - Results

Detector	Mw [Da]	Mn [Da]	Mp [Da]	PDI [Mw/Mn]
PSS SECcurity RI	462	439	435	1,05

Note:

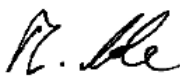
Mw = Weight average molecular weight
 Mn = Number average molecular weight
 Mp = Molar mass at the peak maximum
 PDI = Polydispersity Index

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. a refrigerator (4 °C).

Date of expiry: yyyy/mm/dd (See also product label.)

Date of approval: yyyy/mm/dd

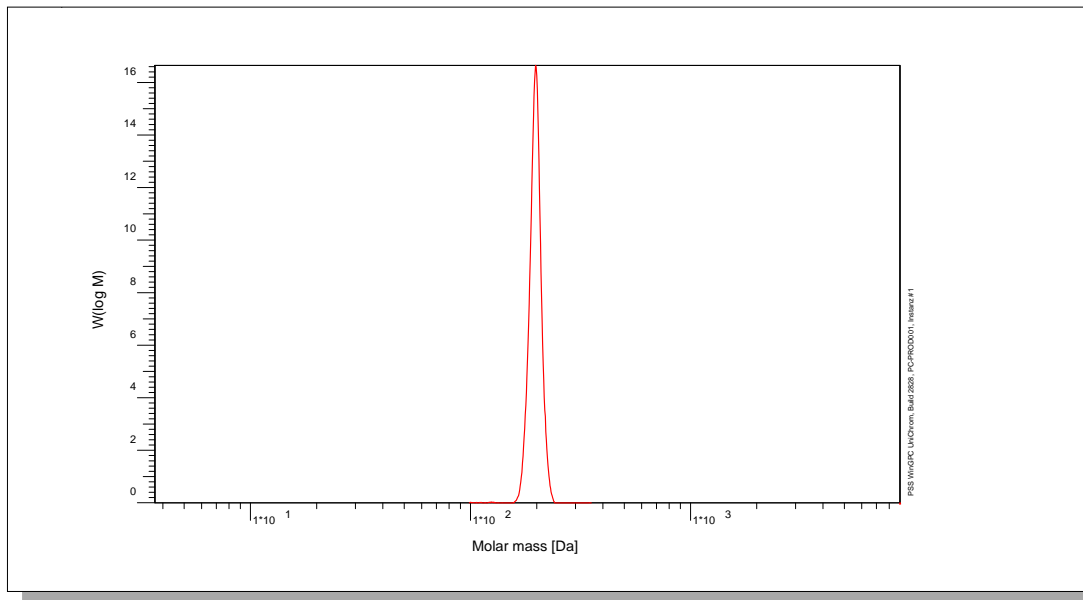
Manufacture control according to PSS method of analysis


 Dr. T. Hofe
 production director

Certificate of Analysis

Polymer type: Poly(propylene glycol)
 Part No: PSS-ppg192
 Lot No: ppg192

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	1,00 g/l	Inject volume	20 µl
Solvent	Tetrahydrofuran	Flow rate	1,00 ml/min
Precolumn [8 x 50 mm]	PSS SDV 3µm	Temperature	23 °C
Columns [analytical, each 8 x 300 mm]	PSS SDV 3µm 50Å / 100Å / 100Å		
Data Acquisition Software	PSS WinGPC	Operator	J.Preis

GPC/SEC - Results

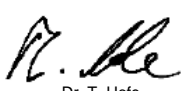
Detector	Mw [Da]	Mn [Da]	Mp [Da]	PDI [Mw/Mn]
PSS SECcurity RI	192	192	192	1,00

Note:

Mw = Weight average molecular weight
 Mn = Number average molecular weight
 Mp = Molar mass at the peak maximum
 PDI = Polydispersity Index

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. a refrigerator (4 °C).
Date of expiry: yyyy/mm/dd (See also product label.)
Date of approval: yyyy/mm/dd

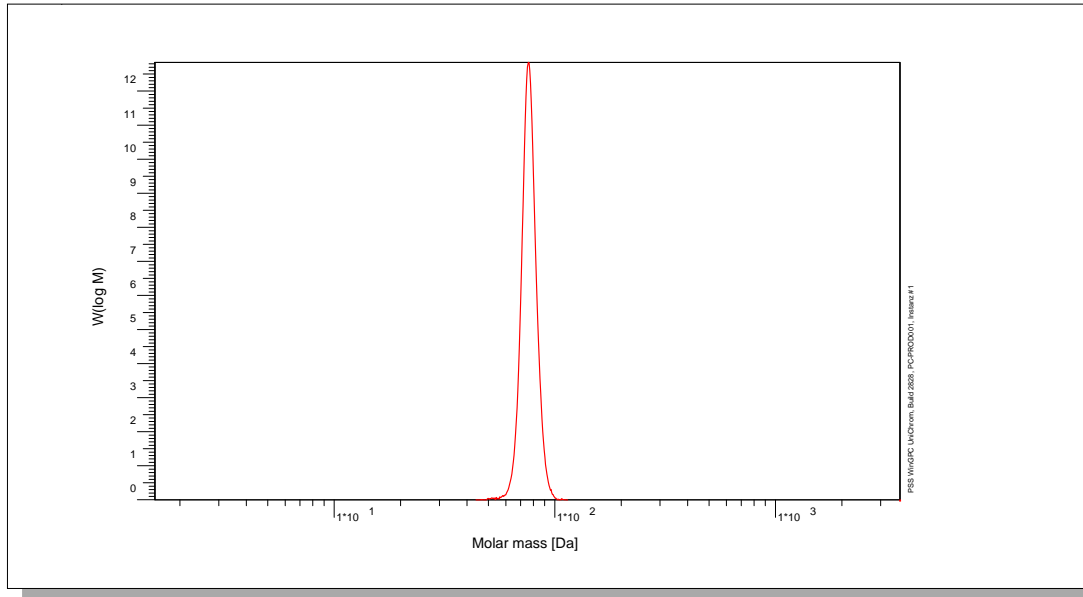
Manufacture control according to PSS method of analysis


 Dr. T. Hofe
 production director

Certificate of Analysis

Polymer type: Poly(propylene glycol)
 Part No: PSS-ppg76
 Lot No: ppg76

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	1,00 g/l	Inject volume	20 µl
Solvent	Tetrahydrofuran	Flow rate	1,00 ml/min
Precolumn [8 x 50 mm]	PSS SDV 3µm	Temperature	23 °C
Columns [analytical, each 8 x 300 mm]	PSS SDV 3µm 50Å / 100Å / 100Å		
Data Acquisition Software	PSS WinGPC	Operator	J.Preis

GPC/SEC - Results

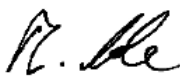
Detector	Mw [Da]	Mn [Da]	Mp [Da]	PDI [Mw/Mn]
PSS SECcurity RI	76	76	76	1,00

Note:

Mw = Weight average molecular weight
 Mn = Number average molecular weight
 Mp = Molar mass at the peak maximum
 PDI = Polydispersity Index

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. a refrigerator (4 °C).
Date of expiry: yyyy/mm/dd (See also product label.)
Date of approval: yyyy/mm/dd

Manufacture control according to PSS method of analysis


 Dr. T. Hofe
 production director