

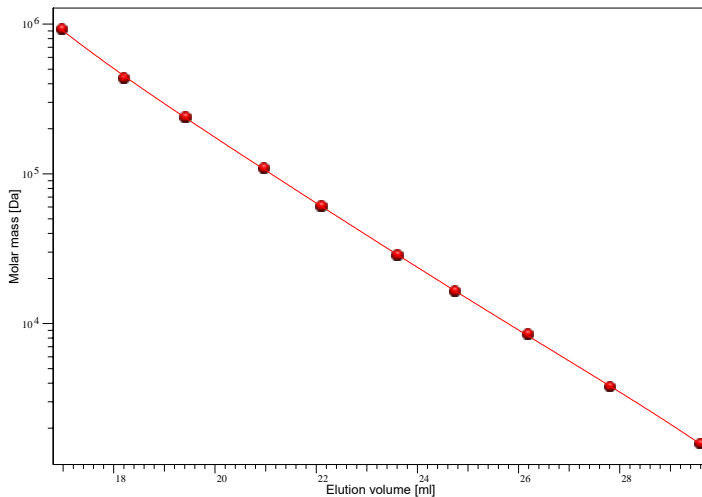
Certificate of Analysis

Kit Poly(alpha-methylstyrene)

Part No: PSS-amskit

Lot No: amskit-01

GPC/SEC Calibration - Curve



Calibration - Conditions

| | |
|---------------------------|-----------------------------------|
| Solvent | THF |
| Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | none |
| Columns [8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å |
| Inject volume | 20 µl |
| Internal standard | Toluene at 34,78 ml |
| Data Acquisition Software | PSS WinGPC |
| Calibration by | S. Fugmann |
| Fit quality | |
| Fit-type | PSS Poly 5 |
| R | 0,999967 |

| Elution volume [ml] | Mp [Da] | Polymer Lot No: | Deviation [%] |
|---------------------|---------|-----------------|---------------|
| 16,9700 | 932000 | ams3076 | - 1,28 |
| 18,1949 | 440000 | ams7056 | 3,36 |
| 19,4095 | 242000 | ams18066 | - 1,57 |
| 20,9533 | 110000 | ams19066 | - 1,56 |
| 22,0941 | 61000 | ams17066 | 0,18 |
| 23,5955 | 28700 | ams8076 | 1,18 |
| 24,7299 | 16500 | ams2056 | 1,14 |
| 26,1791 | 8500 | ams1056 | - 2,11 |
| 27,7979 | 3810 | ams14066 | 0,95 |
| 29,5819 | 1580 | ams4076 | - 0,15 |

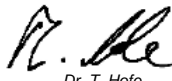
Note:

Mp = Molar Mass at the Peak Maximum

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 and control according to PSS method of analysis

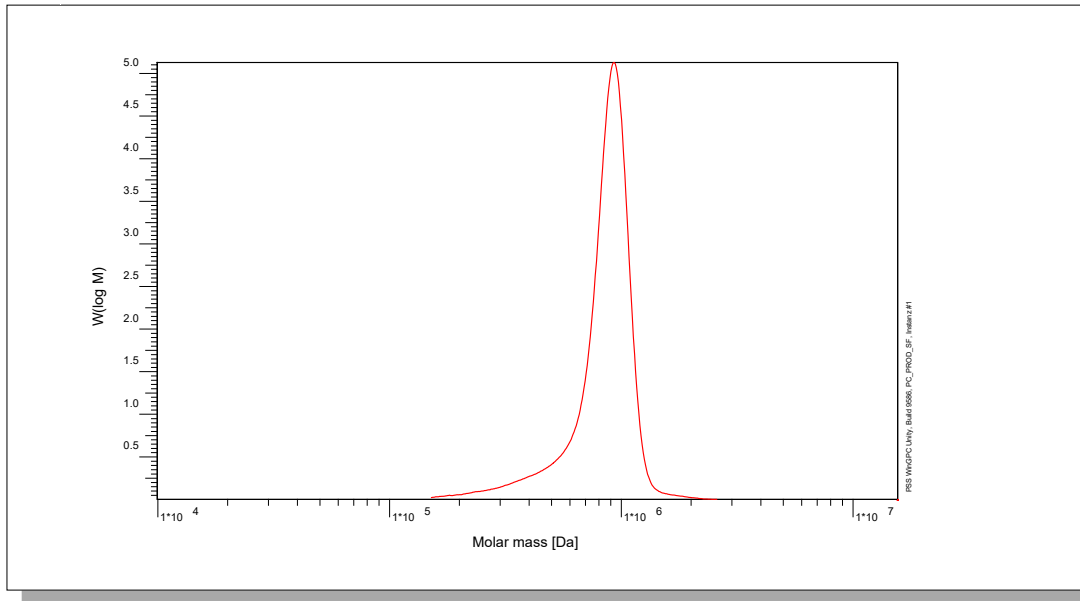

 Dr. T. Hofe
 production director



Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams850k
 Lot No: ams3076

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|-------------|
| Sample concentration | 0,60 g/l | Inject volume | 20 µl |
| Solvent | THF | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | Temperature | 23 °C |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | S. Fugmann |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 868000 | 807000 | 932000 | 1,08 |

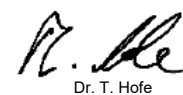
Note:

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 and control according to PSS method of analysis

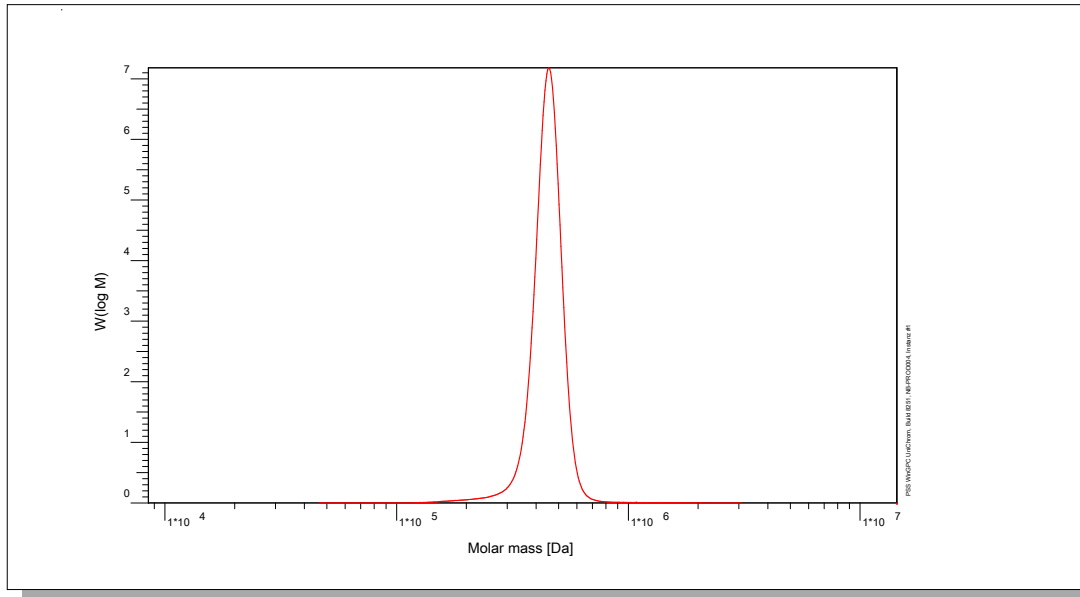


Dr. T. Hofe
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Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams430k
 Lot No: ams7056

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|---------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Flow rate | 1,00 ml/min | Temperature | 23 °C |
| Solvent | Tetrahydrofuran | | |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | | |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | J.Preis |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 437000 | 427000 | 440000 | 1,02 |

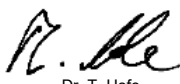
Note:

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

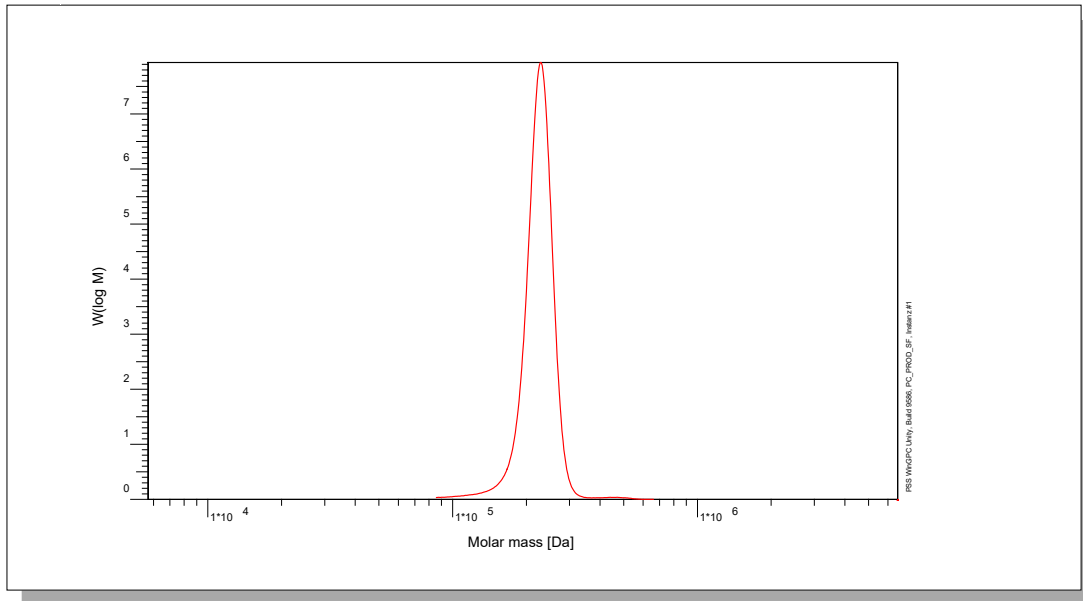
Manufacture and control according to PSS method of analysis


 Dr. T. Hofe
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Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams230k
 Lot No: ams18066

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|-------------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Solvent | THF | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | Temperature | 23 °C |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | S. Fugmann |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 233000 | 227000 | 242000 | 1,03 |

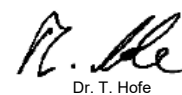
Note:

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 and control according to PSS method of analysis

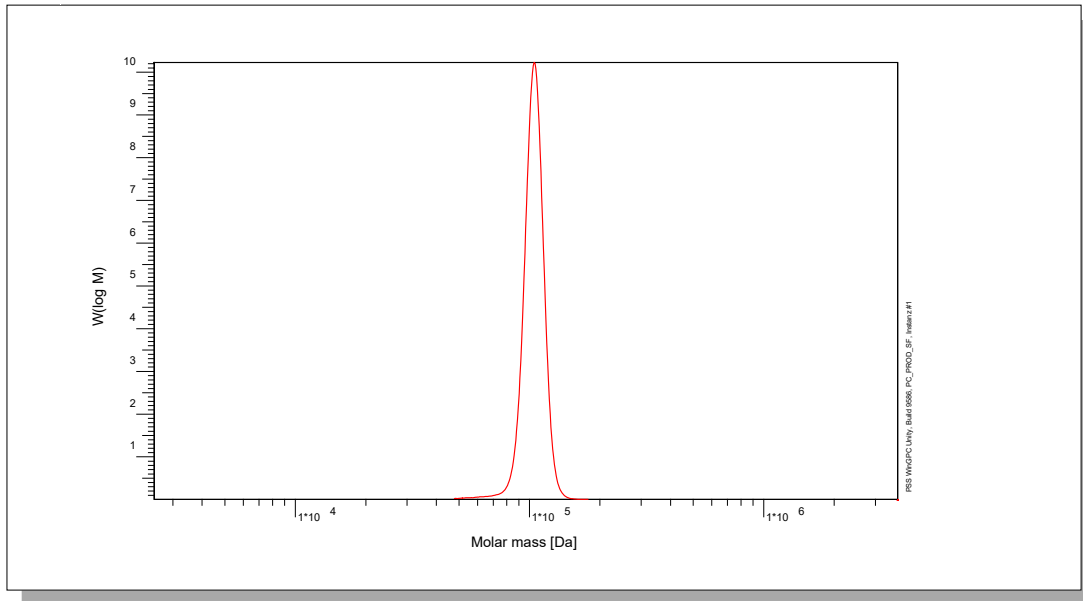


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Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams110k
 Lot No: ams19066

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|-------------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Solvent | THF | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | Temperature | 23 °C |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3A / 10e5A / 10e6A | | |
| Data Acquisition Software | PSS WinGPC | Operator | S. Fugmann |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 108000 | 106000 | 110000 | 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 and control according to PSS method of analysis

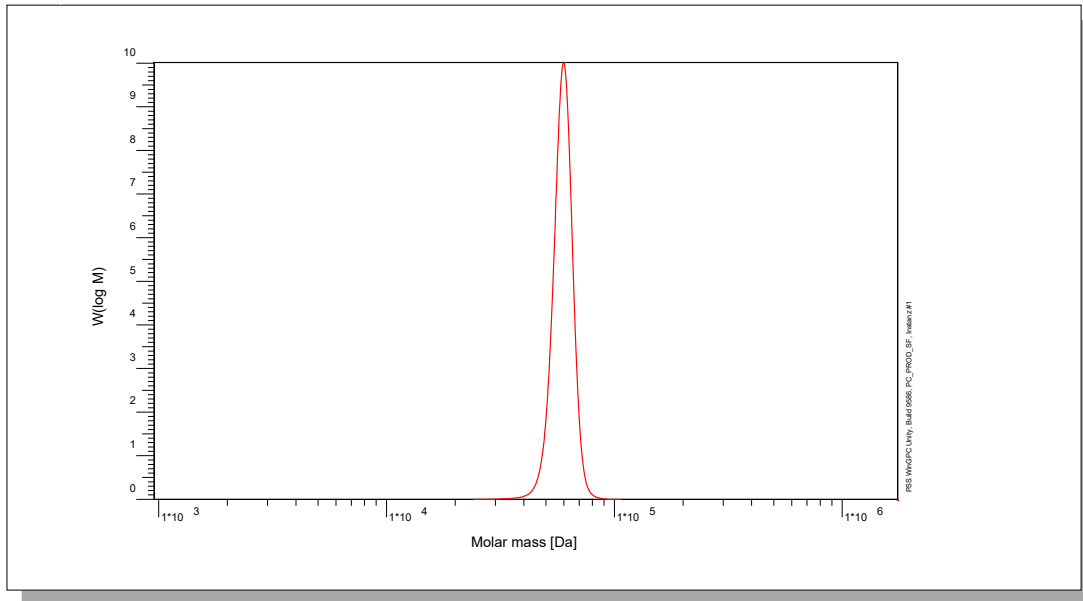


Dr. T. Hofe
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Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams60k
 Lot No: ams17066

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|-------------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Solvent | THF | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | Temperature | 23 °C |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | S. Fugmann |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 59100 | 58000 | 61000 | 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 and control according to PSS method of analysis

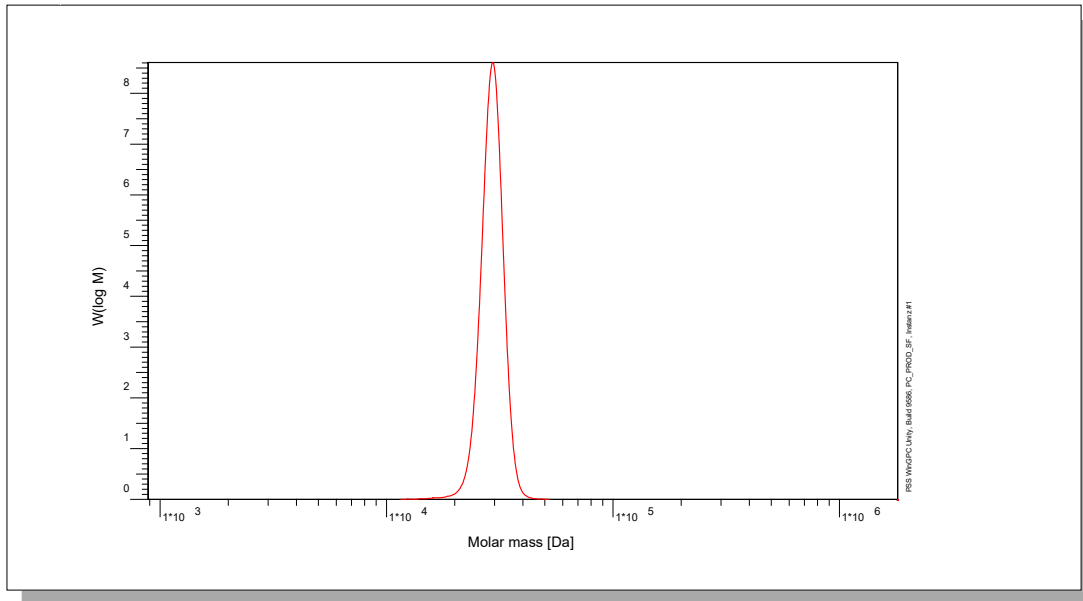


Dr. T. Hofe
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Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams29k
 Lot No: ams8076

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|-------------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Solvent | THF | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | Temperature | 23 °C |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | S. Fugmann |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 28200 | 27600 | 28700 | 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 and control according to PSS method of analysis

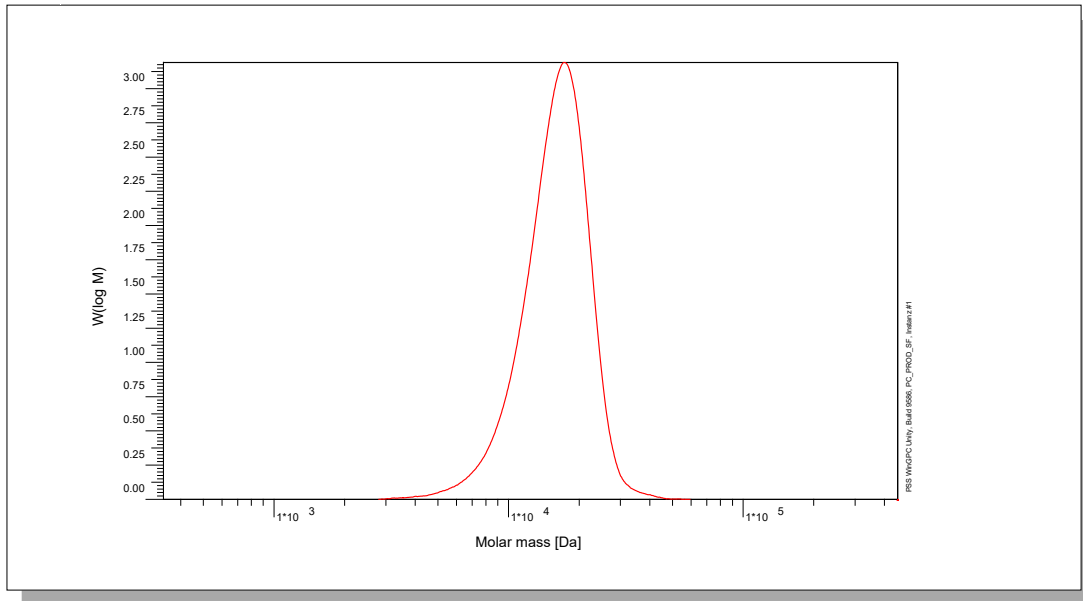


Dr. T. Hofe
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Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams16k
 Lot No: ams2056

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|-------------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Solvent | THF | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | Temperature | 23 °C |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | S. Fugmann |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 15900 | 14200 | 16500 | 1,12 |

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 and control according to PSS method of analysis

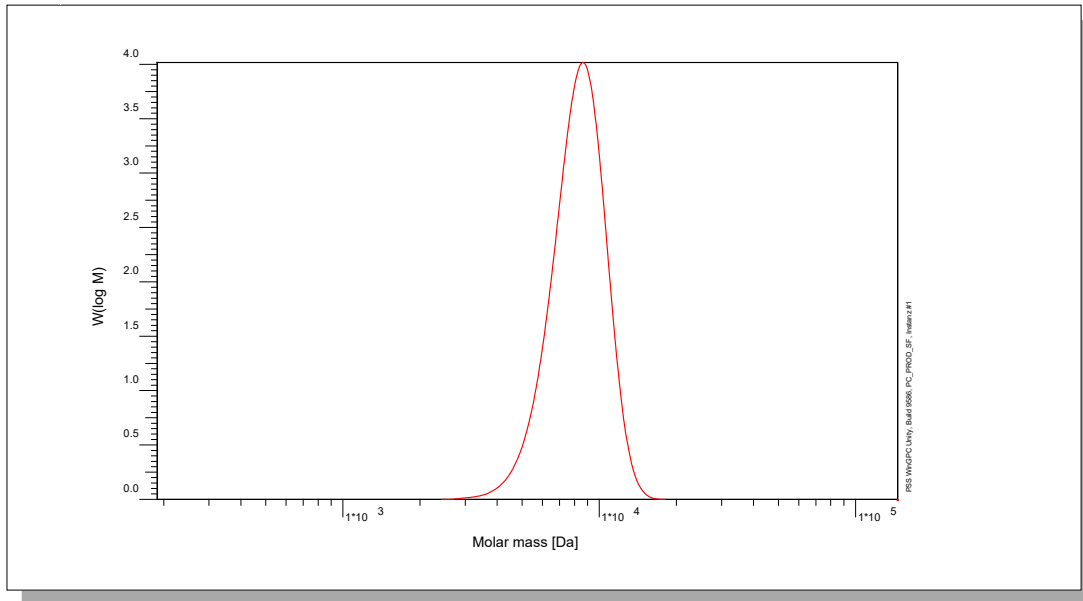


Dr. T. Hofe
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Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams8k
 Lot No: ams1056

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|-------------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Solvent | THF | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | Temperature | 23 °C |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | S. Fugmann |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 8300 | 7800 | 8500 | 1,07 |

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 and control according to PSS method of analysis

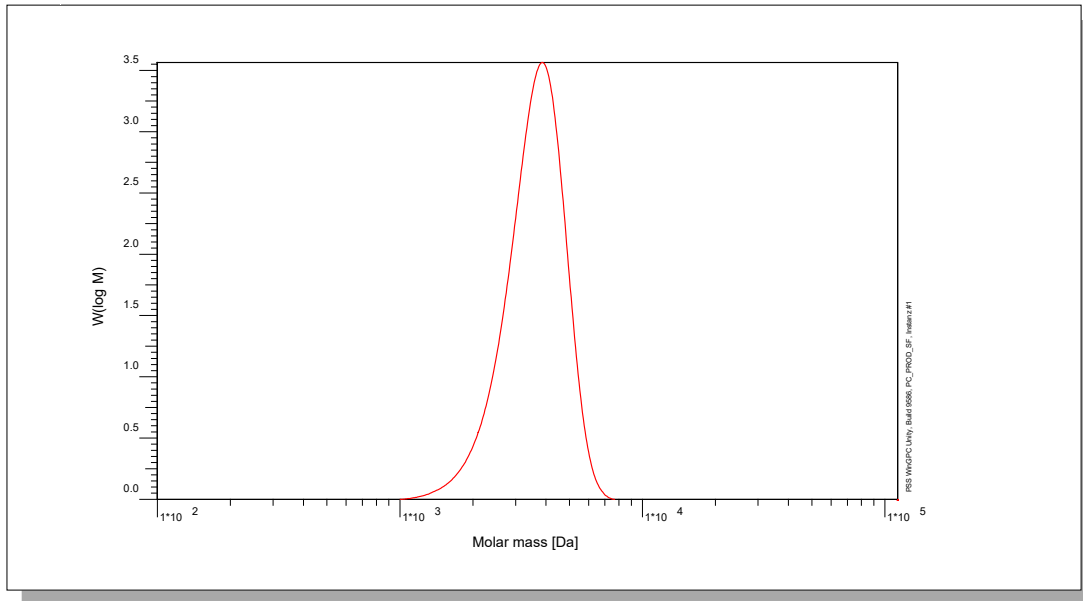


Dr. T. Hofe
production director

Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams4k
 Lot No: ams14066

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|-------------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Solvent | THF | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | Temperature | 23 °C |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | S. Fugmann |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 3660 | 3350 | 3810 | 1,09 |

Note:

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

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 and control according to PSS method of analysis

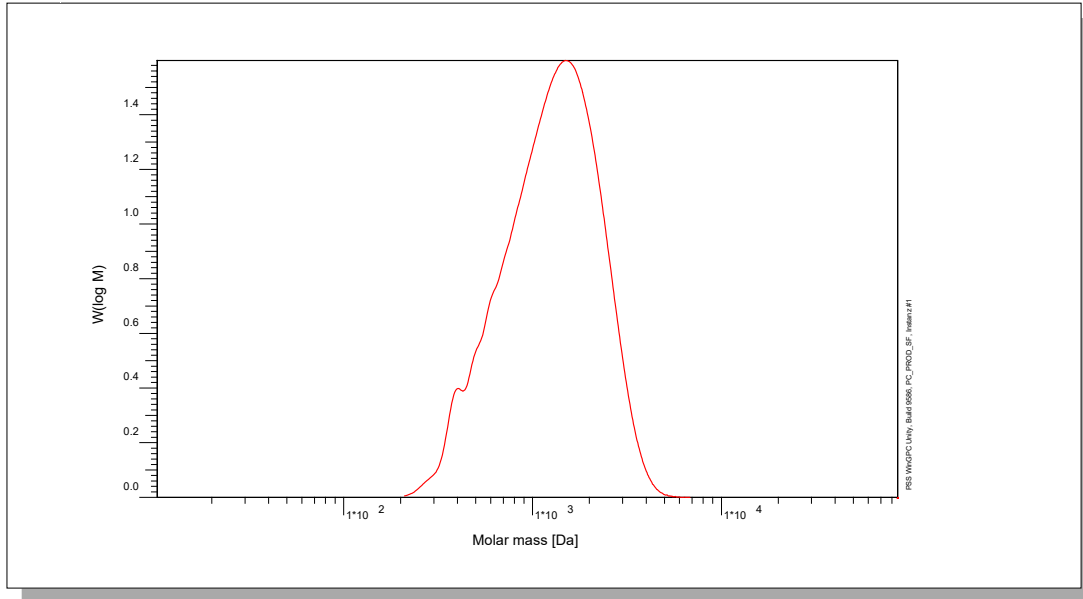


Dr. T. Hofe
production director

Certificate of Analysis

Polymer type: Poly(alpha-methylstyrene)
 Part No: PSS-ams1.5k
 Lot No: ams4076

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|-----------------------------------|---------------|-------------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Solvent | THF | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS SDV 5µm | Temperature | 23 °C |
| Columns [analytical, each 8 x 300 mm] | PSS SDV 5µm 10e3Å / 10e5Å / 10e6Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | S. Fugmann |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|------------------|---------|---------|---------|-------------|
| PSS SECcurity RI | 1500 | 1160 | 1580 | 1,29 |

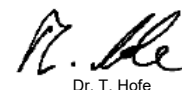
Note:

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 and control according to PSS method of analysis



Dr. T. Hofe
production director