



Driving GPC/SEC Forward



WinGPC UniChrom

# About PSS

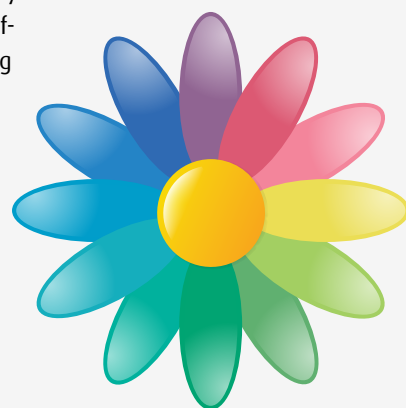
## Driving GPC/SEC Forward

PSS GmbH was founded in 1985 by two PhD students at the Physical Chemistry Department, University of Mainz, Germany, producing polymer standards at the University facilities. In the following years PSS expanded staff and products including tailor-made polymers, organic and aqueous GPC/SEC columns, GPC/SEC software and moved 2001 to own facilities located in Mainz, Germany. PSS-USA opened its office in 1994, operates and serves North and South American customers from Amherst, Massachusetts. To date, PSS has successfully gained leadership in the overall GPC/SEC market, making innovative contributions not only in Germany and the USA, but around the world.

PSS is fully dedicated to the advancement of macromolecular liquid chromatography, by means of materials design, synthesis, manufacturing, consulting, service, and innovative research, applying the highest standard of expertise and reliability. Our close relationship with our customers has helped us to continuously improve the quality of our products and services. Our high caliber staff, mostly chemists, is experienced, creative and trained in problem solving. Corporations, universities, and organizations in more than 60 countries use our products and profit from our outstanding service and know-how.

## Certified DIN ISO EN 9001

PSS is certified (DIN ISO EN 9001:2008) to produce high quality reference polymers, GPC/SEC columns and software for the characterization of polymers by their molecular weight and their structural characteristics. PSS employs the latest findings in polymer science for the synthesis and characterization of polymers, block copolymers and biopolymers. PSS operates a manufacturing facility equipped with a complete state-of-the-art characterization laboratory at the headquarters in Mainz, Germany, fully supporting customers working under stringent requirements i.e., GLP, DIN, ISO certifications.



## Contact

PSS Polymer Standards Service GmbH  
In der Dalheimer Wiese 5  
D-55120 Mainz, Germany  
Phone: +49 6131 96239-0  
Fax: +49 6131 96239-11  
info@polymer.de  
www.polymer.de

PSS-Polymer Standards Service – USA Inc  
Amherst Fields Research Park  
160 Old Farm Rd, Suite A  
Amherst, MA 01002 USA  
Phone: (413) 835 0265  
Fax: (413) 835 0354  
pssusa@pssgpcshop.com  
www.pssgpcshop.com



### Why WinGPC UniChrom?

UNified Macromolecular Chromatography	4
UNIversal Applicability	4
UNIque Solutions	5

### Designed for Now and the Future

<b>From single instrument to Client/Server</b>	<b>6</b>
ChromPilot System Control	7
Client/Server Solutions	7

### Full Compliant and Validated

Complete traceability, reproducibility and trustworthy results	8
UniChrom Compliance Pack	9

### Powerful Software Modules for all Tasks

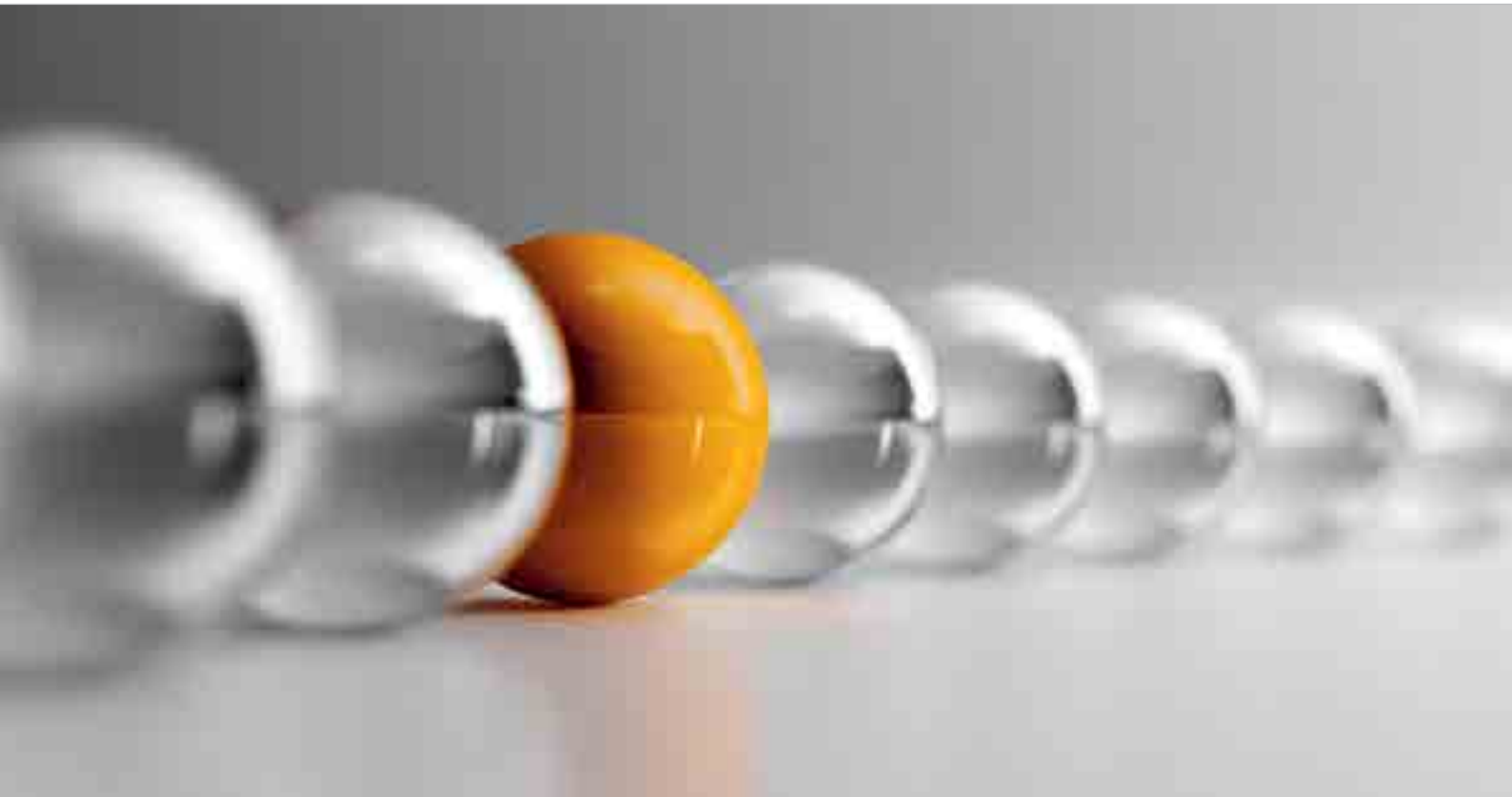
<b>Copolymer analysis tools</b>	<b>10</b>
Module for 2D Chromatography	11
Module for Chemical Heterogeneity	11
Module for Copolymer Analysis	11
<b>Absolute molar mass and structure tools</b>	<b>12</b>
Modules for Light Scattering	12
Module for Viscometry	13
Module for Mass Spectrometry	13
Module for End Group Analysis	13

### Reporting is a Breeze!

WinGPC UniChrom solutions for reporting	14
WinGPC UniChrom Report Designer	14

### Supplies and Services for Comprehensive Characterization of Natural and Synthetic Macromolecules

Reference Polymer Standards	15
Software	15
Analytical Services	15
GPC/SEC Columns	15
GPC/SEC Instruments	15
GPC/SEC Schools and Support	15



## Why WinGPC UniChrom?

### Unified Macromolecular Chromatography

**UniChrom** is a dedicated, modular macromolecular chromatography data system (MCDS) for all separation and detection techniques required for the successful analysis of synthetic and natural (bio)polymers, macromolecules and proteins. No longer will there be a need to learn multiple programs to fully implement macromolecular chromatography within the laboratory.

Time and Cost Savings are the result of more efficient allocation of human resources, instruments and increased laboratory productivity: only one environment to learn, validate and maintain.

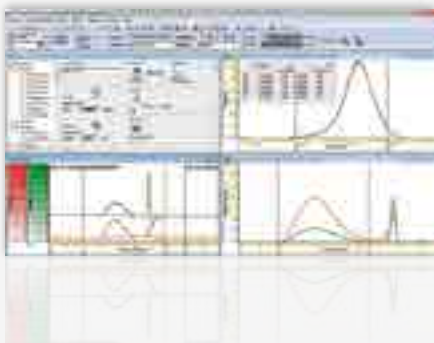
### UNiversal Applicability

**WinGPC UniChrom's** Market-Wide Compatibility lets you acquire data from any commercial system in the market, allowing you to capitalize on previous instrumentation investment. Convenient instrument control is available for many systems and vendors. The **WinGPC UniChrom** permits simultaneous control of multiple instruments and detectors.

The modular software design fits your changing needs by offering a complete path for expansion from a single instrument to network installations up to true Client/Server solutions. Seamlessly fitting software modules for new methods can be added any time making training on new features easy.

### Ease of Use:

Method, Raw Data, Results plus uncertainty values updated as you go.



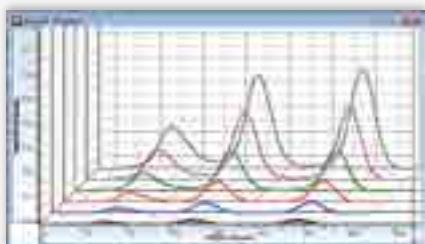
### Be save:

The WinGPC UniChrom project manager provides fast information retrieval and highest data security.



### Get the most out of your data:

Combined HPLC and GPC/SEC analysis and many other options...



## UNIQUE SOLUTIONS

### Ease of Use

#### Keep track:

**A** A clear user interface lets you always see what is going on. A bird-eye-view shows all important parameters and results simultaneously. All windows are updated as you go. WinGPC UniChrom lets you monitor multiple injections, assures complete method documentation and traceability, offers unlimited data acquisition time and allows to prioritize samples.

### Exceptional Data Security

**B** Be safe: Database driven collection and retrieval of data provides fast access to sample information and maximum data security. All information about method, calibration and processing parameters is automatically stored in the database providing an audit-ready environment with complete documentation in an internal log book. Raw data are always protected and cannot be deleted, modified or accidentally be overwritten. The powerful search option ensures fast retrieval of data and all related information.

### Convenient Automation & High Throughput

**C** Concentrate on result interpretation while WinGPC produces results: Wizards and automatic routines for calibration, re-calibration, data evaluation and calculation of product specific parameters and quality related numbers save mouse clicks and provide results... fast!

### Intelligent Solutions and Powerful Tools

**D** Enhance the productivity without sacrificing the resolution:

WinGPC UniChrom's overlaid injection feature saves about 30% time (and eluent) required per injection allowing to inject a sample before the last sample run has completed. Achieve the highest throughput by using WinGPC UniChrom in connection with PSS HighSpeed Columns and the PSS ReadyCal Standards.

#### Precise and accurate results:

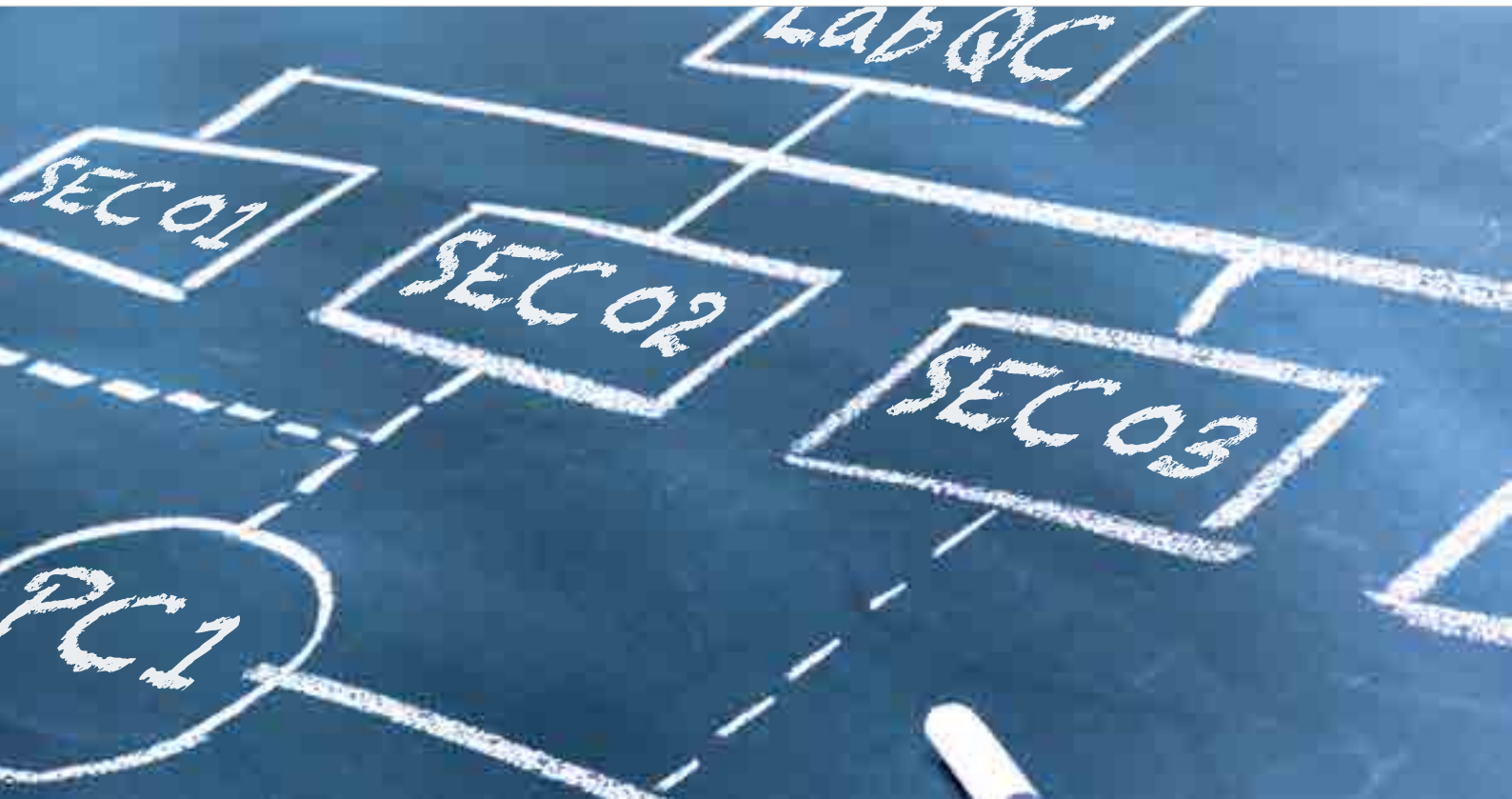
WinGPC UniChrom analyses automatically the quality of raw and meta data and calculates uncertainty values for all results and all methods. The detailed description of the parameters contributing to the result uncertainty helps to identify areas of improvement to produce results with higher quality.

#### Get the most out of your data:

Unique algorithms, focused software modules, meaningful overlays and dedicated tools for many applications provide versatility and eliminate the need for spread sheet calculations. Rely on WinGPC UniChrom for providing traceable and validated results, even for special applications. Ask about our dedicated solutions which are done on a custom programming basis in close cooperation with our users!

A detailed description of general software features, results, supported methods and detectors can be found on our website:

[www.polymer.de](http://www.polymer.de)



## Designed for Now and the Future

### From single instrument to Client/Server



WinGPC UniChrom is the ideal solution for all laboratories. The flexible design fits your changing needs by offering a complete path for expansion from a single user/single instrument with only a limited number of detectors to large installations with multiple users and instruments, even up to true Client/Server setups, where all instruments are available any time, anywhere without any local installation.

#### **Addition of instruments to an existing installation is seamless and easy:**

- Plug-in the instrument(s)
- Add the license file for more instruments
- Benefit from running independent systems in a single environment.

The new instruments gain the **WinGPC UniChrom** advantages already experienced, maintaining the existing configurations, data and methods. Seamless software integration alleviates the need for re-installation, re-validation or additional training.

## ChromPilot System Control

Multiple vendors, multiple systems, multiple detectors all controlled by the WinGPC UniChrom ChromPilot.

## ChromPilot System Control



### Increase traceability and streamline your workflow

The ChromPilot adds comprehensive and convenient system control for many vendors. The future-proven and flexible instrument driver approach guarantees easy, fast and seamless integration of new systems, when they are launched. Mixed systems and configurations are fully supported.



Status and settings of the controlled system are displayed in the Instrument Manager, providing all information at one glance. Typical GPC/SEC timed events like turning off modules, setting parameters (e.g. flow-rate, wavelength) can be done conveniently in one overview window. All system communication is logged in an encrypted instrument audit trail.

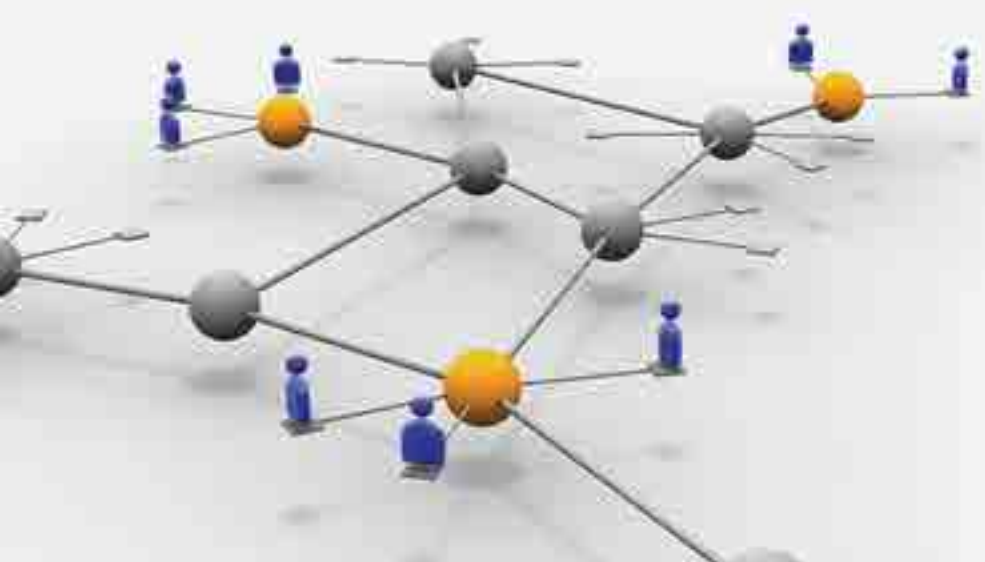
## Client/Server Solutions



### Highest flexibility and convenience

The NetConnect software manages all chromatography systems within the department or even company wide via network. Authorized users may reserve the requested instruments before starting tests. While the data acquisition is activated, the run can be controlled, modified, or processed by any network client with access permission rights. The built in access control guarantees measurements free of interference from other users.

UniChrom Client/Server installations improve compliance and enhance productivity by reduced costs and administration requirements. Contact us to select the ideal setup for your lab.





## Full Compliant and Validated

### Complete traceability, reproducibility and trustworthy results

The PSS Quality Management System ensures design, production, sales and support following the standard ISO 9001.

**WinGPC UniChrom** assures the quality, integrity and reliability of the complete data system by meeting all validation and compliance requirements in R&D and QC environments alike. **WinGPC UniChrom** fully complies with national and international GPC standards: ISO/EN 13885, DIN55672, ASTM D 5296-05, JIS, BR etc.

**WinGPC UniChrom** is a commercial off the shelf chromatography program and is a closed system. It is designed to ensure that the installed product is always identical. The user accessible functionality is controlled by a license key. This allows general validation and verification tools that can be directly executed by the user on-site.

#### Validation

PSS **WinGPC UniChrom** uses additional theoretical molar mass distributions to validate software algorithms and data flow path. The documentation of this validation is provided with every license. The validation can be repeated on every customer workstation to prove operation and correct data flow path on the workstation.



## UniChrom Compliance Pack



WinGPC UniChrom is designed in accordance with FDA 21CFR11 to provide a full feature set to help companies using macromolecular chromatography comply with these regulations.

### Secure login:

Secure login is guaranteed using a unique username and password. A direct link to the Windows authentication ensures that company policy is followed.

### Administration and User Levels:

WinGPC UniChrom offers four different user levels. The Administration tool allows you to add and remove users, to assign a level and to set UniChrom administration rights and group privileges.

The default PSS settings for UniChrom privileges can be adapted by administrators to reflect the tasks in the lab.

### Electronic Signatures:

Results can be electronically signed by users in a two-step process with signing and reviewing. For signing, username and password identification are required as well as the corresponding WinGPC privilege "Assign electronic signatures" or "Approve electronic signatures".

### Traceability with Audit Trails

Four different audit trails independently record operator actions:

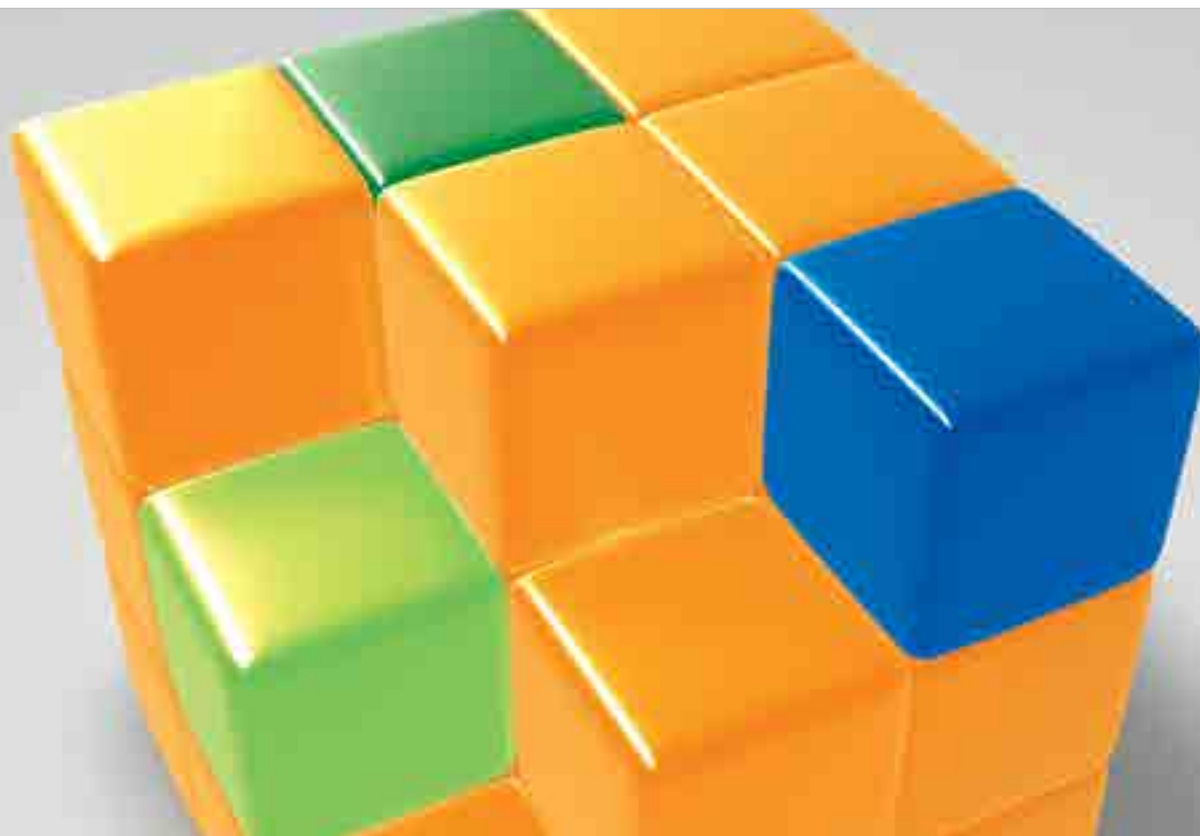
- WinGPC sample audit trail
- WinGPC session audit trail
- WinGPC system audit trail
- WinGPC administration audit trail

Audit trail entries are time stamped and document user, workstation, action, actual value, if applicable previous value, and if selected the reason for change. Audit trails are encrypted, only human readable within UniChrom and can not be edited or modified.

## UniChrom Compliance Pack

21CFR 11 compliance made easy and convenient.





## Powerful Software Modules for all Tasks

### Copolymer analysis tools



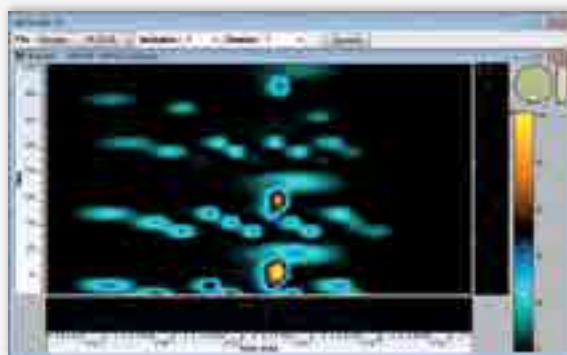
#### Learn more about the chemistry of your macromolecular samples

Many samples are copolymers which have a comonomer distribution and a molar mass distribution. The chemical heterogeneity of a product can be an important parameter for performance and quality.

**WinGPC UniChrom** is the only software that seamlessly integrates any method and detector. Data can be processed/reprocessed on-line or post-run by freely selecting the most appropriate data analysis method or method combination. This reveals a wealth of product properties which are never available in any other software.

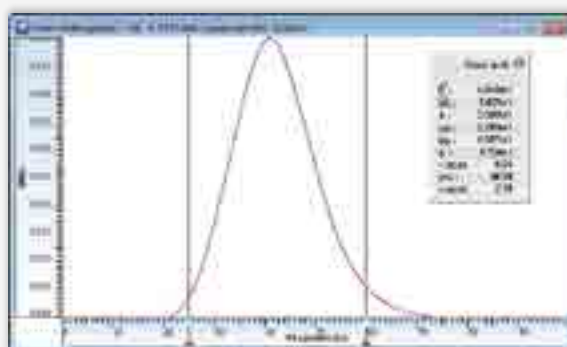
**WinGPC UniChrom** offers a variety of data analysis options to meet any R&D and QA requirement of modern high-tech products. Access the full range of product properties through **WinGPC UniChrom's** advanced and unique characterization modules.

## Module for 2D Chromatography



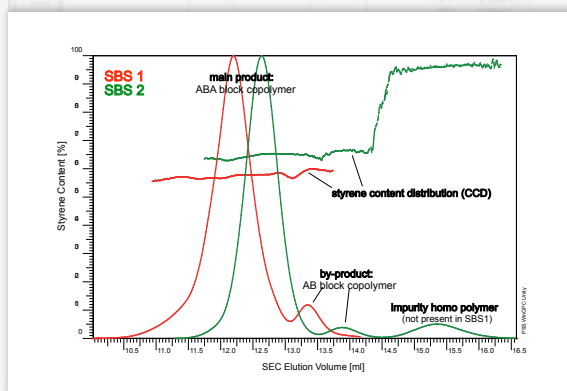
The 2D analysis software module combines the separation power of two different chromatographic methods (HPLC, SEC/GPC, TREF, IC, CE, GC etc.). This results in a dramatic enhancement of resolution and peak capacity as well as in-depth information on complex products. Data acquisition and control of the fraction transfer between dimensions is fully automated. Multiple views of raw and consolidated data, like 3D surface plots or contour maps, are available. **WinGPC UniChrom** is the only software that determines and quantifies multiple property distributions simultaneously.

## Module for Chemical Heterogeneity

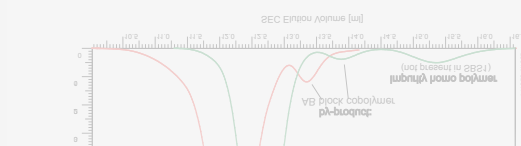


The chemical heterogeneity software module calculates the chemical composition, the skew and width of the compositional distribution based on HPLC-type separations (Polymer-LAC, GPEC). It relies on a composition calibration of the chromatography time base. This calibration can be done either with standards of known composition or via multiple detection (Copolymer Analysis module).

## Module for Copolymer Analysis



The copolymer analysis software module calculates the average chemical composition, the comonomer distribution and the copolymer average molecular weights. It uses multiple detectors in GPC/SEC separations. This data processing method needs at least two independent concentration signals for the automatic determination. It relies on the calibration of the individual signal responses to measure comonomer concentration in an absolute way.



## Powerful Software Modules for all tasks

### Absolute molar mass and structure tools



#### Determine true molar masses and more with advanced detection

The characterization of modern and highly specialized macromolecules is challenged by the various types of monomers and topologies. The macromolecular architecture strongly affects the application properties according to processing ability, rheological behavior and transport properties. GPC/SEC elucidation of these products has become more feasible with the availability of on-line mass spectrometers and molar mass sensitive detectors like light scattering or viscometer devices. They provide absolute molecular weights, the type of branching architecture and the degree of branching.

The correlating of light scattering and viscometry information adds reliability and substance by combining primary information. The use of viscometry in conjunction with RALLS (Triple Detection) has become standard methodology to overcome the limitations posed by 90° light scattering only. The combination of the LS module and the viscosity module adds triple evaluation capability. However, **WinGPC UniChrom** goes one step further by combining MALLS with viscometry. This allows for the unambiguous absolute measurement of branching, aggregation, agglomeration, structure parameters and gel content.

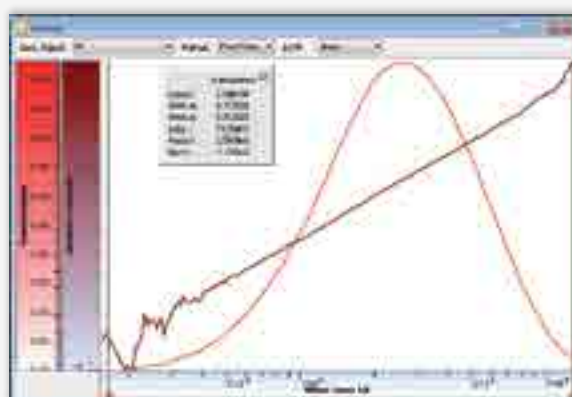
### Modules for Light Scattering



**WinGPC UniChrom** offers two light scattering modules which differ in the number of supported angles. For applications that can be restricted to a single angle the LS module is the suitable choice for any RALLS or LALLS instrument. Validated light scattering data evaluation yields absolute and reliable measurement of all molar mass averages and their distribution, including  $dn/dc$  or recovery determination.

The light scattering module for multi angles has all the single angle features as well as the following additional information: molecular size ( $R_g$ ) and its distribution evaluated with Zimm's, Debye's or Berry's method, degree of branching and structure coefficients. **WinGPC UniChrom** allows monitoring of up to 18 different angles and 6 auxiliary analog signals from RI, UV or viscometer at the same time.

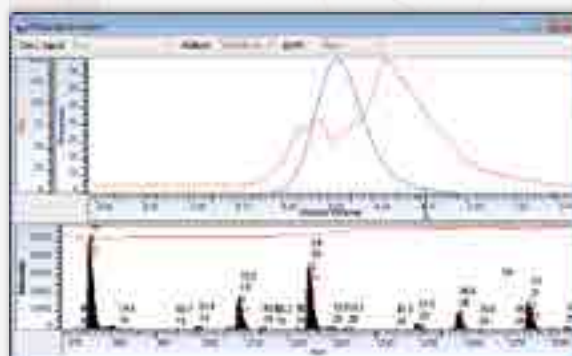
## Module for Viscometry



The viscosity module supports all viscometers regardless of manufacturer or design principle (e.g. single or dual capillary, asymmetric or symmetric bridge). Viscometers directly measure intrinsic viscosity without relying on assumptions.

Validated and proprietary viscometry data processing methods derive true molecular weights and reliable Mark-Houwink constants based on the universal calibration principle. The branching index  $g'$  can be measured across the molar mass distribution.

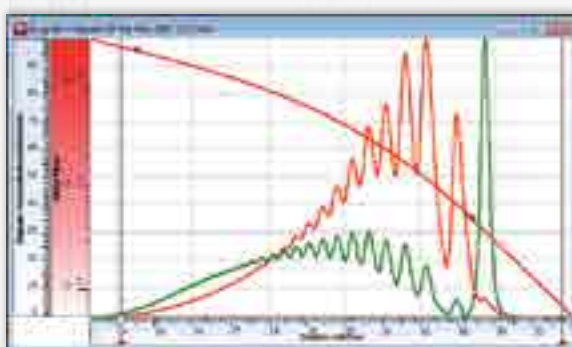
## Module for Mass Spectrometry



The mass spectrometry module supports mzXML data import of mass spectrometry data to **WinGPC Uni-Chrom**. The mass spectrum for every elution volume slice can be reviewed with automatic assignment of degree of charge, the degree of polymerization and the molar mass of the end group.

A dedicated calibration curve can be created after automatic band broadening correction to generate true molar masses.

## Module for End Group Analysis



The end group analysis software module allows the determination of functionality distribution and absolute molecular weights without the need for calibration standards or light scattering detection. End group data analysis only needs two independent detector signals for the automatic calculation of desired results.

In addition, the calculation of heparin product quality in full compliance with national and international pharmacopoeias (e.g. EP, USP, JP, DAB) can be done.



## Reporting is a Breeze!

### WinGPC UniChrom solutions for reporting

WinGPC UniChrom lets you report and distribute information in multiple ways:

- Export the graphics to word processing tools
- Transfer data to LIMS
- Prepare electronic reports in various formats such as pdf or html
- Prepare powerful overlays and distribute them to anyone, anyhow, anywhere

Complete control of the design and content of your report is achieved from the optional WinGPC UniChrom Report Designer.

## Innovative Ideas

The WinGPC UniChrom Report Designer offers options that outshine any report presentation tool. Workflow support on many levels helps to organize and manage samples, reports and resources:

- produce lab statistics such as degree of utilization for instruments or samples/account
- use automatic custom calculation, e.g. average results for repeated injections
- select automatic intelligent rounding of results
- add comments during printout
- set user selectable QC flags automatically
- produce powerful overlays with automatic sorting for sample screening experiments

# Supplies and Services for Comprehensive Characterization of Natural and Synthetic Macromolecules

## Reference Polymer Standards

- GPC/SEC Standards and Kits
- Certified Reference Materials
- MALDI Kits
- Viscosity & Light Scattering Validation Kits
- ReadyCal Kits
- Deuterated Polymers
- Tailor made Polymers and Copolymers

## Software

### WinGPC UniChrom MACROMOLECULAR CHROMATOGRAPHY DATA SYSTEM

- Light Scattering Module for LALLS, RALLS, TALLS, MALLS
- Viscosity Module
- Copolymer Module
- End-group Analysis Module
- 2-dimensional Chromatography Module
- Heparin Module
- LAN/Server Solutions
- Compliance Pack

### PoroCheck SOFTWARE FOR PORESIZE ANALYSIS AND INVERSE GPC/SEC

## Analytical Services

- Molar Mass Determination
- Branching/Structure Information
- Method Development and Transfer
- Complete Product Deformulation
- Consulting

## GPC/SEC Columns

- For all Organic Eluents
- For all Aqueous Eluents
- For High and Low Molecular Weight Synthetic and Bio-Polymers
- From Micro GPC/SEC up to Preparative Scale
- HighSpeed Columns for fast Analysis

## GPC/SEC Instruments

- Complete Systems and Components
- Light Scattering Detectors
- Viscosity Detectors
- dn/dc Instrumentation

## GPC/SEC Schools and Support

- Full Services from Installation to Validation, Operation, and Repair
- GPC/SEC and Software Training Schools
- GPC/SEC In-house Training
- User Meetings
- NetCommunity with Application and Publication Downloads



your local distributor



[www.polymer.de](http://www.polymer.de)