POSTNOVA
Leading in FFF

The Field-Flow Fractionation Platform

Advanced Nano, Polymer and Protein Characterization

www.postnova.com

Postnova – The FFF Inventors

30 Years of Innovation and Excellence in FFF and Light Scattering

The Invention of Field-Flow Fractionation

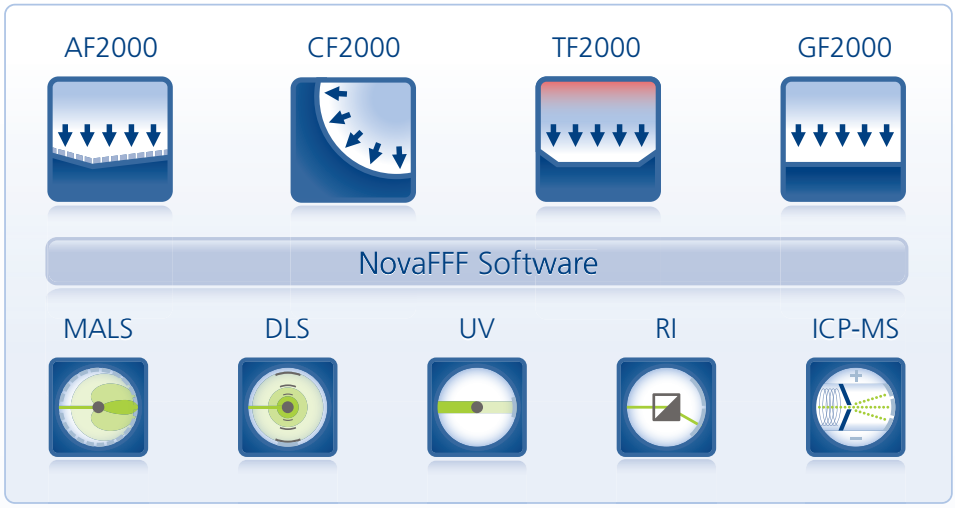
The story of Postnova FFF started when Prof. Calvin Giddings from University Utah, Salt Lake City, USA invented and patented Field-Flow Fractionation in 1966. Giddings was a passionate scientist in the area of separation science and a two-times Nobel Prize nominee. He and his co-workers laid the theoretical foundations for FFF and founded the world's first FFF company FFFractionation in 1986. Giddings and his group invented all major FFF versions which were commercialized first by FFFractionation (now Postnova USA) in the 1980s.

The New Era of Field-Flow Fractionation

A complete new era in FFF started with the commercialization of the first automated Asymmetric Flow FFF (AF4) which was developed at Technical University of Munich in 1995, followed up by the foundation of Postnova Analytics in 1997 in order to market this technology. In the 1990s Postnova was able to establish its new automated AF4 technology at leading chemical and pharmaceutical companies and research institutions worldwide.
Then in 2001 FFFractionation, the FFF Inventor's company became part of the Postnova family and in the following years Postnova build up the most comprehensive and complete FFF product line based on the original work, know-how and patented technologies of Prof. Giddings. Since then Postnova has been clearly the leading innovator in the field of FFF, by continuously inventing new FFF Technologies which pushed FFF to new levels of performance, sensitivity, reliability and flexibility.

The Field-Flow Fractionation Platform

Today the unique Postnova FFF Platform contains Asymmetric Flow FFF (AF4), Hollow Fiber Flow FFF (HF5), Centrifugal FFF (CF3), Thermal FFF (TF3) and Gravitational FFF (GF3). All these FFF variants share the same modules and online detectors such as MALS, DLS, Visco and MS.



The flexibility of the Postnova FFF Platform is manifested by the fact that all mayor modules can be used at the same time for Flow FFF, Centrifugal FFF and Thermal FFF. Many modules, such as the pumps, degassers, auto injectors, fraction collectors and detectors can be shared between the FFF technologies. All is controlled by the single NovaFFF software and also detectors such as MALS, VISCO, DLS and ICP-MS are integrated making data analysis and evaluation a simple task.
The FFF Platform is the only complete solution on the market, which includes all modules provided by one manufacturer, single software control and integration of Flow, Centrifugal and Thermal FFF. This makes the Postnova FFF Platform the gold standard and the most flexible choice available without typical worries about service and support as this is all taken care by Postnova.

Milestones & Achievements

2016 First Online Viscometer
Launch of first Postnova Online Viscometer for FFF, SEC and GPC

2013 First dedicated FFF-MALS
Postnova presents the world's first Multi Low Angle MALS with 21 angles

2011 First Hollow Fiber Flow FFF
Postnova presents its first own commercial Hollow Fiber Flow FFF (HF5)

2008 Thermostated Flow FFF
Postnova presents the new AF2000 thermostated Flow FFF

2006 First High Temp. Flow FFF
Postnova Analytics & Dow Chemical invent and develop the world's first High Temperature Flow FFF

2001 Foundation of Postnova USA
FFFractionation Inc. becomes part of the Postnova family

1997 Foundation of Postnova
Dr. Thorsten Klein founds Postnova Analytics in Munich, Germany

1995 Commercial Asym. Flow FFF
Development of first automated Asym. Flow FFF by Dr. Thorsten Klein at Technical University Munich, Germany

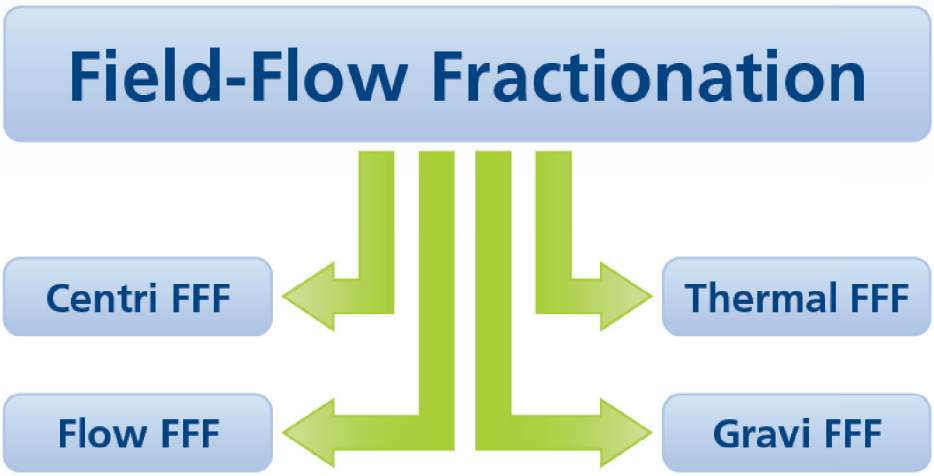
1986-1988 Worlds first FFFs
Introduction of first commercial FFF system by FFFractionation: F1000 Flow FFF, T100 Thermal FFF, S101 Sedi FFF

1986 Foundation of FFFractionation
Prof. Calvin Giddings, Inventor of FFF, founds FFFractionation in Salt Lake City

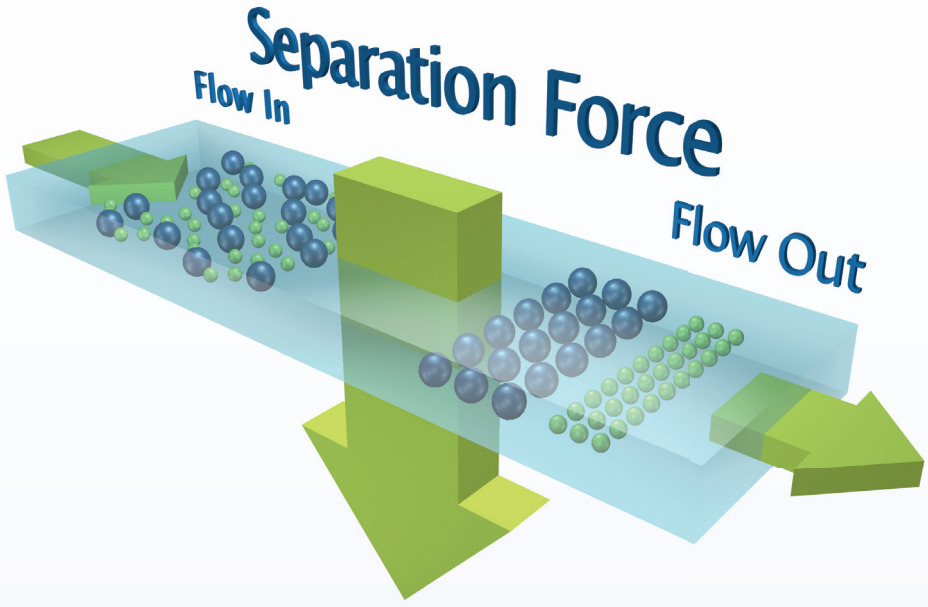
1966 Invention of FFF
Prof. Calvin Giddings invents Field-Flow Fractionation at University of Utah in Salt Lake City, USA

FFF Principle

Field-Flow Fractionation is a family of unique separation techniques, comprising of various different subtechniques, just like chromatography. All FFF versions utilize the same basic separation principle, but employ different separation fields. Depending on the used separation field, the technique is called Flow FFF, Centrifugal FFF, Thermal FFF and Gravitaional FFF.



FFF is providing fast, gentle and high resolution separations of any particulate matter from 1 nm up to 100 µm in any liquid media. The sample is separated inside an open flow channel without the presence of any packing or stationary phase inside. Inside the channel a laminar flow with a parabolic stream profile is formed. The different used force fields, such as liquid flow, centrifugal force, temperature gradient or gravity, are applied perpendicular to the main flow which transports the sample through the channel. Under the influence of these force fields and the counteracting diffusion of the particles, different equilibrium layer heights are formed by the different particle size fractions. Smaller particles, with stronger diffusion are located higher in the channel in stream lines and elute first. Bigger particles with a lower diffusion coefficient are located in slow stream lines and elute later.



AF2000 MultiFlow FFF Universal Separator

Separation based on Hydrodynamic Size. For Proteins, Antibodies, Vaccines, Biomolecules, Polymers, Nanoparticles.

Separation Range
1 nm to 10 µm

Available Versions
AF2000 Ambient Temp AF4
AF2000 Mid Temp AF4
AF2000 High Temp AF4
AF2000 Hollow Fiber AF4

CF2000 Centri FFF Particle Separator

Separation based on Hydrodynamic Size/ Density. For Nano- and Micro-Particles, Emulsions, Carbon Nanomaterials.

Separation Range
10 nm to 50 µm

Available Versions
CF2000 Standard CF3

TF2000 Thermal FFF Polymer Separator

Separation based on Molar Mass/Chem. Composition. For natural and synthetic, cross-linked, branched Polymers and Gels.

Separation Range
1 nm to 10 µm

Available Versions
TF2000 Standard TF3

GF2000 Gravimetric FFF Particle Fractionator

Separation based on Mass/Density/ Shape. For Sediments, Diatoms, Algae, Plancton and synthetic Microparticles.

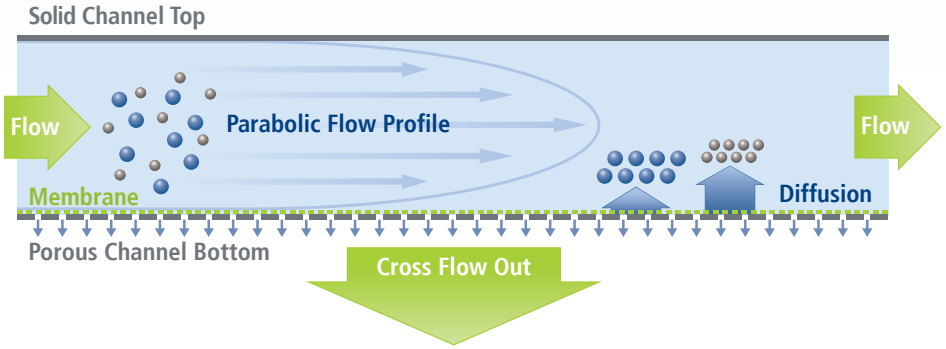
Separation Range
1 µm to 300 µm

Available Versions
GF2000 STD Gravitational FFF

Asymmetric Flow FFF - AF4

AF2000 MF MultiFlow System

Flow FFF has been the most important FFF technique since over two decades now, whereas Asymmetric Flow FFF is a subcategory of Flow FFF. Postnova Analytics has been setting the standard in this area since the beginning. The company developed and introduced the first Flow FFF instrument (Model F1000) in 1986, launched the first commercial automated Asymmetric Flow FFF (Model HRFFF-10.000) in 1997, first Dual-Pump Focusing Asym. Flow FFF in 2004 and finally invented and presented the first temperature controlled Mid and High Temperature Asymmetric Flow FFF in 2004. In 2011 then Postnova presented its first Hollow Fiber Flow FFF.



Today, Postnova offers its customers the most advanced and flexible FFF technology available, protected by and based on several patents. In Asymmetric Flow FFF the separation force is generated by a cross flow field inside the channel. The cross flow is divided from the main flow, pumped through the channel and is directed through a semi-permeable membrane which is located at the bottom wall. The membrane pores size prevents the sample to pass through, but allows the solvent to exit the channel easily. The sample fractions are eluted out of the channel in direction to the detectors by the remaining channel flow.

AF2000 MF Versions

AF2000 AT (Ambient Temperature)

The AF2000 AT is a standard Flow FFF working at ambient temperature which is ideal for the use in general level research in universities, companies and public scientific centers. It is available as aqueous metal-free, stainless steel and multisolvent version and can be run with a broad range of aqueous and organic solvents.

AF2000 MT (Mid Temperature)

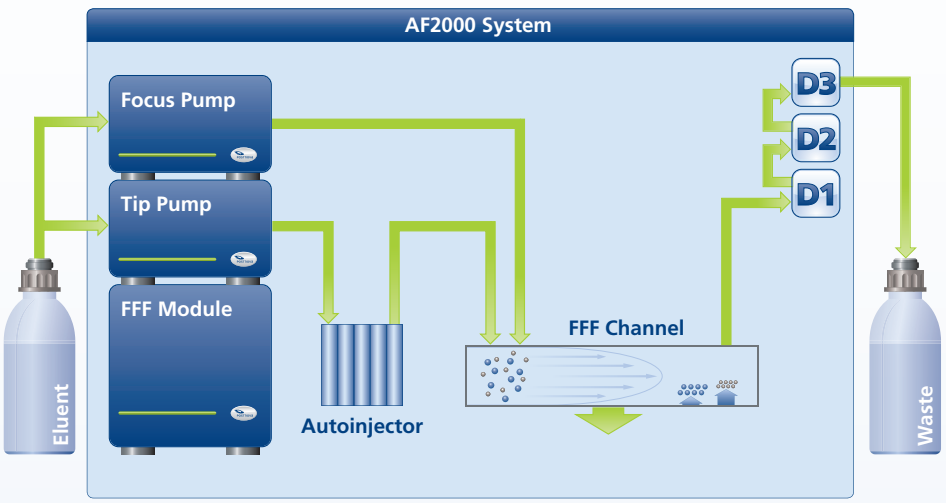
The AF2000 MT is a temperature controlled advanced Flow FFF system, which is ideal for the use in higher level research at universities and public research institutions as well as professional research and commercial-industrial applications in the area of product development, manufacturing and quality control.

AF2000 HT (High Temperature)

The AF2000 HT is a special temperature controlled toplevel Flow FFF system, which is ideal for the use in research, development and quality control of polyolefins and high temperature macromolecules in universities, public research institutions and industry.

Professional Modular Platform

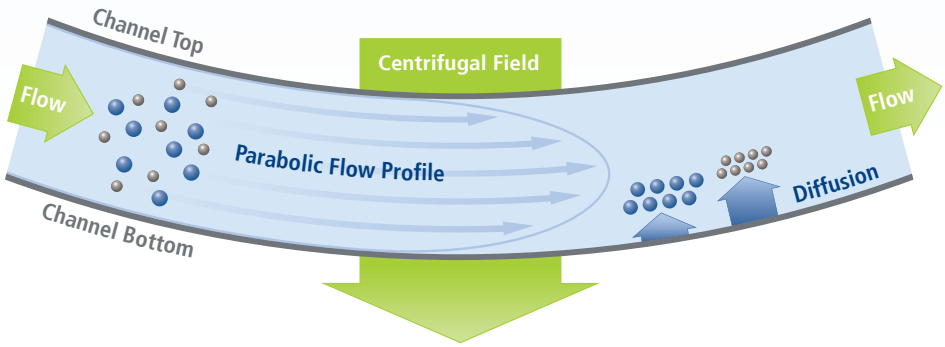
The new Postnova AF2000 MultiFlow FFF Series was developed to become the first professional modular Flow FFF platform available running under just one software. It is completely integrated by the NovaFFF single software platform which runs the entire system from autosampler to detectors. The AF2000 Series incorporates the know-how and the patented technologies from over three decades of leadership in FFF. Due to its unique design, the AF2000 MultiFlow platform offers more flexibility, higher robustness and better performance than any other system before. The technology sets the standard in the area of Flow FFF and marks a real break-through in FFF science and therefore has naturally become the leading Flow FFF solution for many scientists around the world.



Centrifugal FFF - CF3

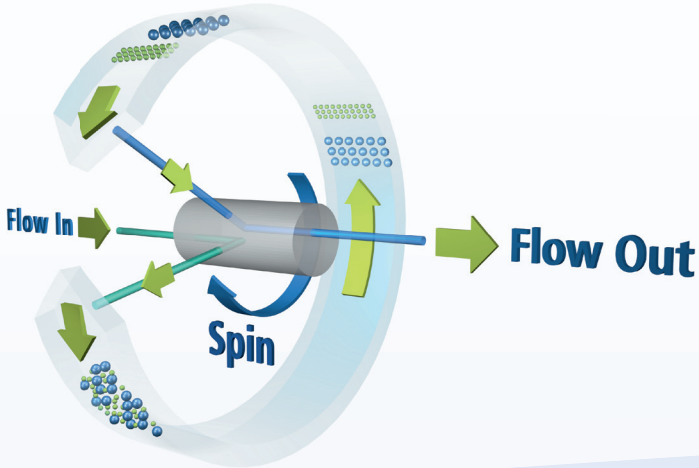
CF2000 Centrifugal System

Centrifugal FFF has been an important member of the FFF family since its invention in 1974 by Giddings et al. In the literature the technique is mostly referred to as Sedimentation FFF. The first commercial Centrifugal FFF in the 1980s was a system based on a commercially available Ultracentrifuge, the Model SF3 – 1000 Sedimentation Field Flow Fractionator. After that in the 1990s the S-101 Sedimentation FFF was launched.



Since 2001 the model CF1000 was provided, which was followed up in 2010 by the new CF2000 Series for advanced nanoparticle separation and characterization. In all this years Postnova has been setting the standard in the area of Sedimentation/ Centrifugal FFF and has continuously improved this proprietary technology. Thus today, Postnova offers its customers the most advanced particle separation technology available based on the Centrifugal FFF principle.

In Centrifugal FFF the separation force is generated by rotating the entire ring shaped flow channel. As the main flow carries the sample particles through the channel they are affected by the centrifugal field which is generated by the rotation. The larger/ heavier particles are more strongly forced towards the channel bottom than the smaller and lighter particles which stay away from the channel bottom wall. As a result of this, smaller particles are located in the area of faster stream lines and thus will be eluted first out of the channel, followed by larger particles which are located in the region of slower streamlines. The separation in Centrifugal FFF is based on particle mass (size and density) and allows a very high resolution separation of particles showing only 5 % difference in size. The unique system design allows the sample to be directed into the rotating channel, where the particles are separated by their size and mass. While the channel is rotating with a speed of up to 4900 rpm the different sample fractions elute out of the channel directly into the online coupled detectors. As Centrifugal FFF offers a high resolution separation of particles, the coupled detectors are used for further characterization and quantization. Typical detection principles for Centrifugal FFF are UV, DLS and MALS to yield concentration, particle size and elemental distribution.



Broad Separation Range

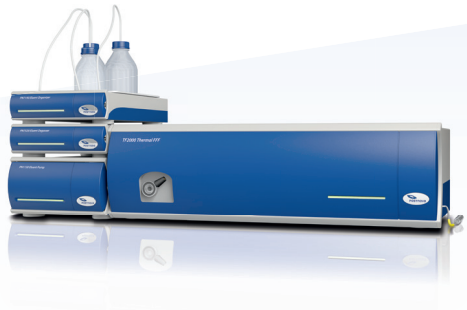
The CF2000 system has a wide separation range and is able to separate smaller species, such as proteins and polymers from larger particles in one run with high resolution. The system is ideal for nanoparticles and works up into the microparticle range. Typical samples for the CF2000 Centrifugal FFF are latex, silica, TiO_2, ZnO, Ag and Au particles. But also sediment and various organic and inorganic particles from surface, ground and waste waters can be separated and further analyzed after fractionation. In contrast to traditional particle sizing techniques which work in the batch mode, the Centrifugal FFF technique physically separates each particle fraction prior to sizing. This avoids numerous disadvantages of the batch techniques such as, low size resolution, discrimination and underestimation of smaller by larger particles. Same as with Flow FFF no special sample treatment is necessary as they can be injected directly without filtration, allowing the characterization of quite complex particulate sample systems without alteration and damage.

Particle Size and Density Separation

The CF2000 Series system uses a centrifugal field as driving force for the separation. Particles affected by this field are separated by dynamic diffusion on the basis of both, particle size and density. This unique feature allows the separation of different particle materials having the same particle size. Therefore, the CF2000 can be used for the separation of complex particle samples in the area of environmental, food-agro-cosmetics and nanomaterial analysis.

Thermal FFF - TF3

TF2000 Thermal System



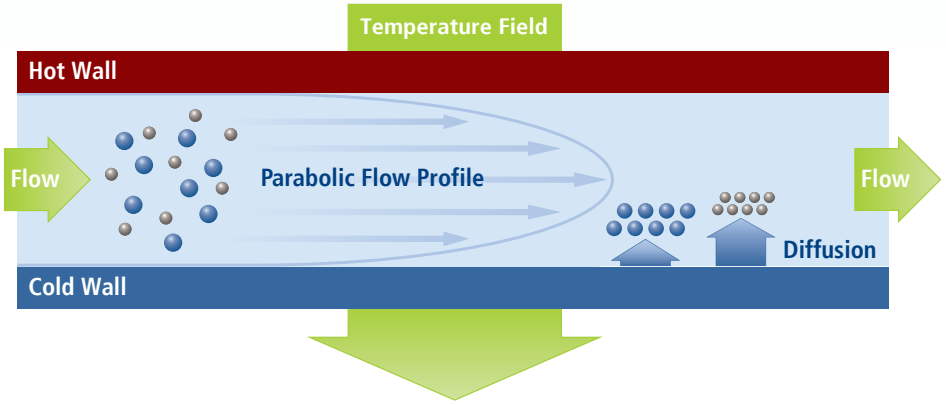
Thermal FFF has been employed as an innovative technique for polymer characterization since the early 70s after it was invented. However, in the beginning years only a basic version of the instrumentation was available and just lately newer and more advanced Thermal FFFs have been commercialized. The technology is mostly used with organic eluents and is well-established in the rubber and chemical industry. It does not need any membrane inside the channel and can separate by molar mass and chemical composition. Postnova Analytics has set the gold standard in this area since the beginning. The company developed and introduced the first commercial Thermal FFF instrument (Model T-100) in 1986 and launched a revised version Model TF1000 in 2001.

Broad Separation Range

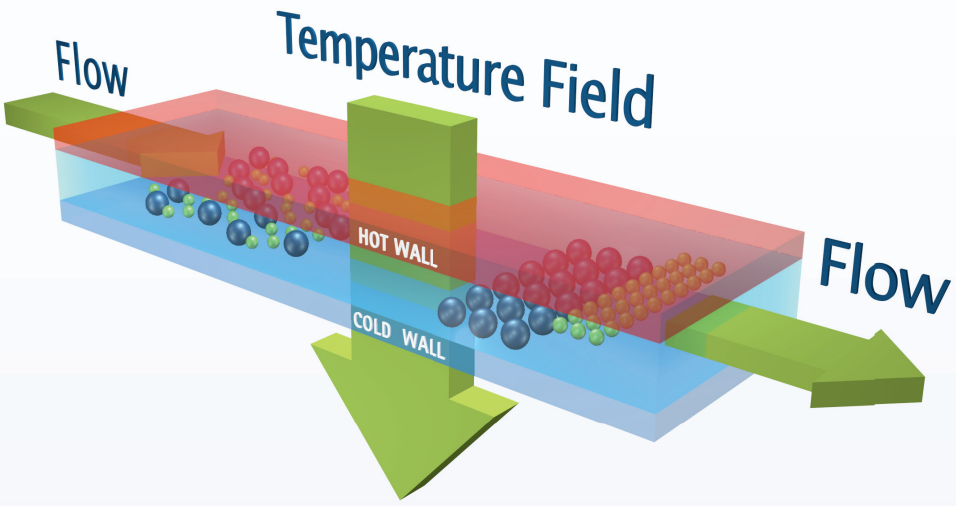
The TF2000 system has a wide separation range and is able to separate small and large molar masses with high resolution. This allows the separation of various polymers, such as starches, polystyrenes, polymethylmetacrylates, synthetic and natural rubbers as well as other elastomers. In contrast to traditional chromatographyic separation techniques such as GPC/SEC, no sample treatment is necessary as the samples can be injected without filtration. This allows the characterization of quite complex polymer samples without any potential alteration and damage. Also, Thermal FFF has no Size Exclusion limit and because of this even ultra-high molar mass, branched and cross-linked polymers as well as gels, aggregates and particles can be separated.

Molar Mass and Composition Separation

The TF2000 Series system is based on the Thermal FFF principle, using a temperature gradient as driving force for the separation. Polymers affected by this field show thermal diffusion which allows the separation by both, molar mass and chemical composition. This unique feature allows the separation of different polymer materials having the same molar mass. The separation can be further optimized by the use of different eluents and various temperature programs. Hence, the TF2000 can be ideally used for separation of complex polymer samples in the area of petrochemicals, adhesives, rubbers, polymers and nanomaterials.



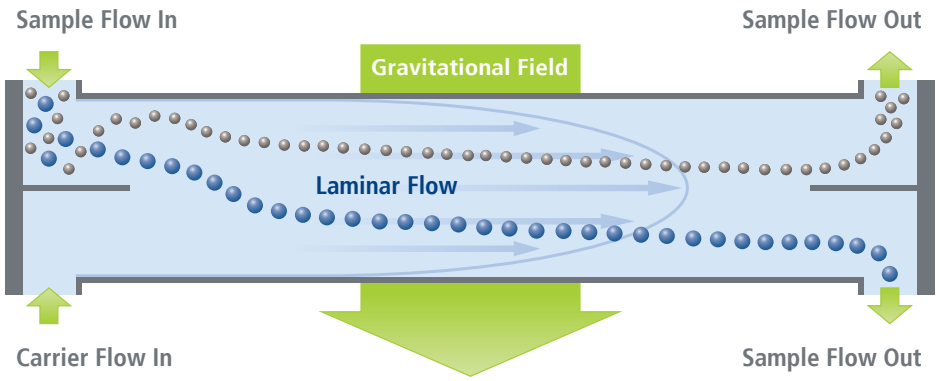
Finally in 2007, a fully automated Thermal FFF Model TF2000 with state of the art electronics was presented. The TF2000 can be used in R&D and QC as it meets the most strict international safety regulations. The system uses less power and heating/cooling than previous systems, is controlled by Ethernet TCP/IP interface, and can be controlled by the NovaFFF software platform which is used for all Postnova FFF systems. In Thermal FFF the separation force is generated by a temperature gradient field across the channel. The top wall of the channel is heated up to 190 °C whereas the bottom wall of the channel is thermostated to a lower temperature in the range of 15-20 °C. The polymer molecules which enter the channel are forced in direction of the bottom wall by this temperature gradient. This process is called thermal diffusion (described by the Soret Coefficient). The dynamic diffusion (Brownian Motion) is counteracting from bottom to top resulting in an equilibrium layer for smaller polymers which are located higher in the channel and for larger polymers and gels which are located lower in the channel which is closer to the bottom wall. As a result of this the smaller molar masses located in the faster stream lines elute first out of the channel followed by the larger molar mass fractions which elute later in the direction to the detectors.



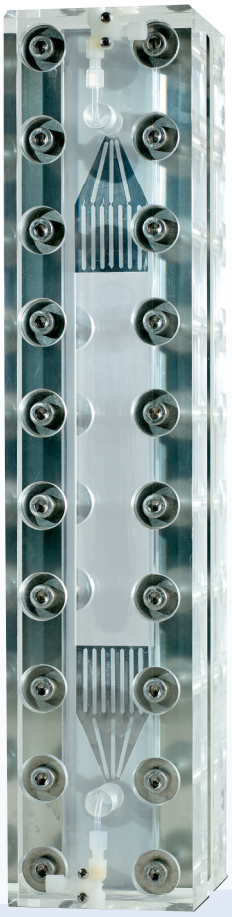
Gravitational FFF - GF3

GF2000 Gravitational System

Gravitational FFF has been the last method developed by Giddings and although it belongs to the FFF family of methods, Gravitational FFF has a slightly different working principle than the other FFF modes. Since the beginning GF3 had the role of being the preparative FFF technique, while the other FFF version were acting as analytical methods. The sample amounts used in GF3 can be several milligrams, grams or even more, whereas in the other FFF techniques microgram to milligram quantities are injected. Another big difference is that the sample feed is introduced continuously into the GF3 channel and thus a high through-put can be achieved. After Gravitational FFF was developed in the 1980s the first instruments have been introduced by Postnova Analytics in 1990, Model SF1000, followed by the first fully integrated system Model SF1000 STD, which was launched in 2001.



After that, in 2009 an even more advanced system was developed, the Model GF2000, which was coupled to the PN3000 XPT Optical Particle Detector for on-line size and shape determination. Today, Postnova offers its customers the most advanced GF3 technology, available in different versions and with optimized online detectors, such as XPT. Gravitational FFF is employing an FFF-like separation channel. But unlike the other FFF versions, the channel has two in- and two outlets. Also there are two splitters located centrally in the middle of the channel in the inlet and outlet regions. The sample is continuously introduced at the top inlet of the channel, whereas a second carrier flow is pumped into the channel via the bottom inlet. While traveling through the channel, larger particles settle down faster than smaller particles and thus larger particles exit the channel at the lower outlet whereas smaller particles are removed from channel by the upper outlet. The size cut-off, purity and through-put is controlled by adjusting the ratio and the absolute flow rates which are pumped into and out of the channel in- and outlet ports.



Same as in the other FFF versions, also in Gravitational FFF different physical separation fields can be utilized. These forces can be based on earth gravity, but also centrifugal or magnetic forces have been used. When using gravity, the applied field is 1G and called Gravitational FFF. This GF3 technology is suitable for separation of any particles which show sufficient sedimentation velocities under the influence of earth gravity. This is typical the case for particles above 1 µm in size. The upper limit of Gravitational FFF is reached when particles are getting too large for the channel dimensions (380 to 1150 µm) or when their settling velocity is too fast compared to the lateral channel flow rate. This limits the upper usable size range to about 300 µm.

Broad Separation Range

The system uses a gravity field and thus can separate microparticles from about 1 to 300 µm in typical aqueous based carrier solutions. A resolution of 1 µm size difference can be achieved for smaller particles.

Gentle Separation Conditions

Because of the open channel and the absence of any stationary phase the separation in Graviational FFF can be performed under the absence of shear forces and stress avoiding particle aggregation. Also various water-based eluents can be used, so that the ideal conditions for suspending the particles can be maintained.

NovaFFF XPT Particle Detection

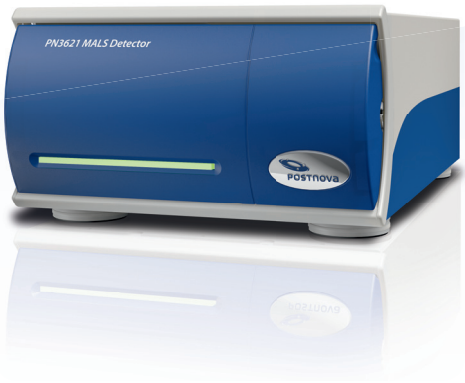
The GF2000 has an online coupled Optical Particle Detection system, PN3000 XPT, as back end. This detection system allows to completely characterize the separated particle size fractions as they elute from the GF3 channel. The included software allows determining the particles size, shape and number as well as the collection of pictures of each particle size fraction.

On-line and Off-Line Detection

The GF2000 system can be easily hyphenated on- and offline to additional advanced detection systems, such as Absorbance (UV/Vis), Fluorescence (FLD), Dynamic Light Scattering (DLS), Optical Particle Detection (XPT), X-Ray, Laser Diffraction and Microscopy. By investigating the separated particle size fractions these detection systems can provide improved and more comprehensive compared to using them without any front end GF3 separation system.

Multi-Angle Light Scattering - MALS

PN3600 Series



The PN3600 Series of Multi-Angle Light Scattering detectors has been especially developed for coupling with Postnova Field-Flow Fractionation separation systems. The MALS Light Scattering platform consists of different variants offering a flexible solution for all kind of FFF applications. Based on over two decades of practical experience in using and hyphenating FFF and MALS, Postnova offers the most flexible and powerful MALS solution available today. The unique PN3621 MALS is the top model of this PN3600 detector series, meeting the highest requirements in terms of robustness, precision and flexibility, and offers unique technical features:

Advanced Opto-Electronics

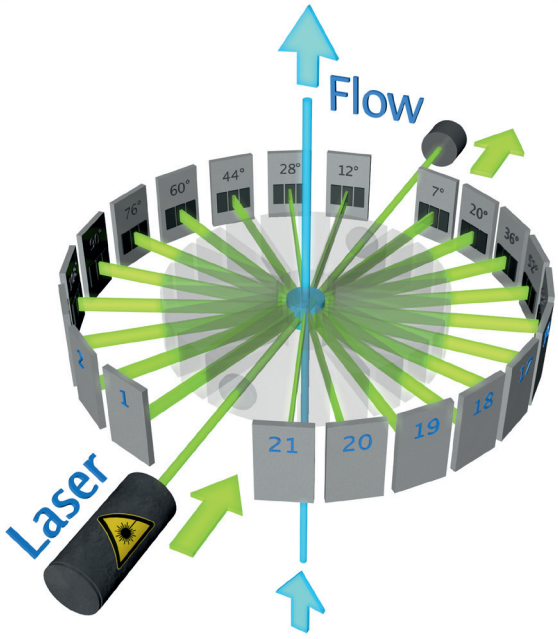
The PN3621 MALS employs the latest opto-electronics and laser designs, including digital signal processing for each of the 21 angles. The electronics is based on a true 24 bit resolution AD system and offers a broad dynamic signal range. For maximum flexibility it is possible to connect up to 3 external analogue signals. The PN3621 is very compact and light weight with a small footprint, saving limited lab space and allowing a flexible use and transportation to different locations.

Vertical Flow Cell

MALS is typically used to measure larger sample species, such as protein aggregates, high molar mass macromolecules and particles. Because of their size and fragile nature these samples need a gentle treatment to avoid any alteration. Potential shear forces, chain degradation, conformational changes and deterioration or complete loss of bioactivity can be induced by turbulent light scattering flow cells. Also aggregation, adsorption and sedimentation phenomena can cause problems inside horizontal light scattering cells, especially when constructed with internal flow obstacles, edges and dead volumes. The new Postnova PN3621 avoids all this and offers a vertical flow cell where the sample can easily pass through without any alteration. There is no need for constant ultra-sonic cleaning.

Maximum Number of Angles

The Postnova PN3621 MALS detector system incorporates 21 fully working angles available in aqueous and organic solvents. This is the broadest angular range of any commercial light scattering instrument available today. The 21 angles are crucial to fulfill the high requirements set for measuring complex particular samples, ensuring the highest precision in molecular weight and particle size determination. With 21 angles the PN3621 allows to achieve better results by improved data fits and provides the best results in your laboratory, especially for high molar mass polymers, particles and protein aggregates.



Unique Low Angle Range

The precision of molar mass and particle size determination is not only dependent on the total number of angles available, but even more on the number of working low angles which can be used for calculation. Especially angles below 35° are crucial for a correct molar mass and size determination, such as for branched polymers, high molar mass macromolecules, protein aggregates and particles. The Postnova PN3621 MALS meets this standard and offers a complete set of stable working low angles at 7°, 12°, 20° and 28° onwards which is far more than currently available in traditional MALS instruments.

Broad Application Range

Because of its unique design, flexibility and advanced performance features, the instrument is ideally suited for the most challenging nano- and macro-applications from various areas in science:

- Biotechnology: Alginates, Carrageenans, Hyaluronic Acids, Cell Organells, Exosomes
- Biopharmaceutical: Peptides, Proteins, Antibodies, Virus Aggregates and Conjugates
- Food and Agro Science: Starches, Pectins, Polysaccharides, Proteins, Casein Micelles
- Polymer Science: Rubbers, Latex Dispersions, Polyolefins, Polyelectrolytes
- Environmental Research: Humic-Fulvic Colloids, Iron Oxides, Clays, Silica Particles
- Nanotechnology: TiO_2, CNT, C60, Latex, ZnO and Silica Nanoparticles

Dynamic Light Scattering - DLS

Malvern Zetasizer Nano Series ®

The High Sensitivity Online Dynamic Light Scattering Detector is specially costumized for the hyphenation with Field-Flow Fractionation (AF2000, CF2000 and TF2000). By performing online DLS measurements, the Zetasizer Nano enables the determination of particle size (Rh), molecular weight (Mw), zetapotential and corresponding distributions of dispersed particles and molecules separated by Flow, Centrifugal and Thermal Field-Flow Fractionation.

Online Mode Specifications

Particle size range (Dh): 2.0 nm - 2.0 µm*
Molecular weight range estimated from Dh or calculated from Debye plot:
10^4 - 10^7 Da*
Sensitivity: 200 µg total sample for 67.000 Da BSA; 50 µg of 60nm polystyrene latex,
Typical FFF flow rate range:
0.05 to 1.0 mL/min
Pressure range: maximum 1.5 bar differential pressure at cuvette inlet/outlet
* Depending on sample material, concentration and FFF flow rate

Batch Mode Specifications

Particle size range (Dh): 0.3 nm - 10 µm
Peak mode range (Dh): 0.6 nm - 8.9 µm
Molecular weight range estimated from Dh: 342 - 2x10^7 Da*
Molecular weight range calculated via Debye plot: 980 - 2x10^7 Da*
Sensitivity: 0.1 ppm*, 0.1 mg/mL, 15 kDa protein; 0.1 ppm of 60 nm polystyrene latex, conc. maximum: 40% w/v*
Minimum sample volume: 12 µL
* Depending on sample material, concentration and FFF flow rate

Zetasizer Flow Detector

The advanced detector hardware allows operation in Online Mode connected to FFF with a special flow cell for continuous DLS and also in Offline Mode using standard cuvette cells as stand-alone detector for batch DLS measurements. The system allows input of up to two additional external FFF detectors (e.g. RI, UV, FLD, etc.) and automated operation when used together with the PN9020 Interface Box for remote start capability. The Zetasizer Nano is connected as the last detector inline. Switch between flow and batch mode measurements is achieved by simply changing the cuvette within seconds. The system automatically identifies eluted FFF peaks without any calibration, expressed as size or molecular mass. Software allows overlay of RI, UV and FLD traces with Rh data and also static light scattering intensity signal. Using the Zetasizer Nano there is no need to rely on size or molecular weight calibration standards for FFF anymore.

Zetasizer Flow Software

The advanced detector software allows fully automated operation and ease of use by employing SOPs for repeatability between operators, systems and sites. There is a custom report generator integrated to meet the requirements of every laboratory. Several parameters can be easily monitored, such as temperature trend analysis, time trend analysis, selected parameter trend analysis, overplotting of results for direct comparison and a full range of statistical plots.

Options (to be selected)

- High power laser/alternative wave length 50 mW, 532 nm
- High temperature up to 120°C
- Narrow band filters for 633 nm or 532 nm to improve signal for fluoresce samples
- Pharma 21 CFR part 11 software option, enabling an operating mode that assists with ER/ES compliance
- Research software option for advanced system utilities
- Zetapotential measurement option

Inductively Coupled Plasma – MS

Agilent 7900 and 8800 ICP-MS

Unrivaled performance driven by hardware innovation

- Unprecedented matrix tolerance His torically, ICP-MS has been limited to samples that contain <0.2% total dissolved solids (TDS). A robust plasma (indicated by a CeO/Ce ratio <1%) enables the 7900 ICP-MS to easily tolerate this matrix level. The ultra high matrix introduction (UHMI) option enables you to routinely measure samples containing up to 25% TDS - 100 times higher than the traditional limit, and far beyond the capability of any other ICP-MS.
- Better trace-level detection a novel interface design and optimized expansion-stage vacuum system increase ion transmission, providing >109 cps/ppm sensitivity at <2% CeO. What's more, the new orthogonal detector reduces background, dramatically improving signal to noise for lower detection limits and more accurate ultra-trace measurements.
- Faster analysis of transient signals Fast transient signal measurement - used for applications such as capillary chromatography, single-nanoparticle analysis, and laser ablation - requires an instrument with very short integration times. The ICP-MS provides ultra-fast data acquisition, with 10,000 separate measurements per second.

Agilent Technologies

Channel Partner

The Agilent 8800 is the world's first ICP Triple Quad (ICP-QQQ) – a truly groundbreaking instrument that transforms the ICP-MS landscape. Combining the proven capabilities of ICP-MS with the unique power of MS/MS, the 8800 ICP-QQQ is a new analytical tool that can handle even the most difficult samples and applications with ease. With MS/MS, the 8800 ICP-QQQ unlocks the potential of reaction cell chemistry to remove spectral interferences, delivering greater accuracy and more consistent results. Equally at home in demanding, high throughput laboratories and research facilities, the 8800 excels in applications ranging from environmental to semiconductor. And with its unique combination of flexibility, ease of use and unmatched analytical power, the 8800 takes ICP-MS to a whole new level of performance.

The power of MS/MS

- Unparalleled accuracy – MS/MS unleashes the full power of reaction cell ICP-MS by eliminating the variability associated with reaction mode on existing quadrupole ICP-MS (ICP-QMS). In ICP-QQQ, the first quadrupole prevents all off-mass ions from entering the cell, allowing more controlled and efficient interference removal in reaction mode. The result is more accurate and reliable data – regardless of sample type.
- Incomparable performance – the 8800 also sets new performance benchmarks in no gas mode and collision mode, with outstanding signal to noise compared to ICP-QMS. And MS/MS gives the 8800 the highest abundance sensitivity ever seen in ICP-MS: <10-10, further improving data integrity in high matrix samples.
- Total flexibility – although it is designed to meet the demands of high throughput routine laboratories, the 8800 also offers complete flexibility in operation, making it a perfect research tool. An array of advanced MS/MS acquisition modes is available, enabling the study of ion-molecule reactions, polyatomic ion formation and much more.

Intuitive, configurable MassHunter software

From automated startup checks following plasma ignition, through batch and queue method setup and sequencing, to integrated data processing and final report generation, the ICP-MS MassHunter Workstation software ensures your Agilent 8800 is always performing at an exceptional level.

- AutoTune and application-specific preset methods enable users to quickly produce reliable, consistent results.
- A single hardware control pane (shown below) provides a comprehensive overview of hardware configuration, performance reports, early maintenance feedback, and system diagnostics.
- Batch and queue interface puts critical method setup and sample analysis at your fingertips.
- The batch pane brings together tune settings, acquisition/data analysis parameters, and sample list, so that all experimental details are accessed through a single convenient interface.
- The queue pane displays current and scheduled tasks, current batch sequence, and real-time status of the current sample.

Product Portfolio

Components and Brands Overview

Analytical Systems: Flow FFF – Centri FFF – Thermo FFF – Grav FFF – MALS – DLS – ICP-MS

Field-Flow Fractionation (FFF) for advanced Separation, Characterization, Speciation and Fractionation of Proteins, Viruses, Liposomes, Biomacromolecules, Synthetic Polymers, Nano and Micro Particles

- AF2000: Asymmetric Flow Field-Flow Fractionation for Protein, Polymer, Particle Separation
- CF2000: Centrifugal Field-Flow Fractionation for Particle Separation
- TF2000: Thermal Field-Flow Fractionation for Polymer Separation
- GF2000: Gravitational Field-Flow Fractionation for Microparticle Fractionation

Multi-Angle Light Scattering (MALS), Dynamic Light Scattering (DLS) and Inductively-Coupled-Plasma Mass-Spectrometry (ICP-MS) for Molar Mass and Size Determination of Proteins, Viruses, Liposomes, Bio/Polymers and Nano and Micro Particles

- PN3100: Refractive Index Detectors optimized for FFF with High Sensitivity and Baseline Stability
- PN3200: Ultraviolet Absorbance Detectors for FFF with Variable Wavelengths
- PN3300: Viscometric Detectors for powerful Polymer Characterization
- PN3400: Fluorescence Detectors for FFF with Ultra-High Sensitivity and Spectra
- PN3500: Evaporative Light Scattering Detectors for FFF
- PN3600: Multi Angle Light Scattering for Molar Mass and Gyration Radius (Rg) Determination
- PN3700: Dynamic Light Scattering Zetasizer Nano for Hydrodynamic Radius (Rh) Determination
- PN3900: Inductively-Coupled-Plasma Mass-Spectrometry (ICP-MS) for FFF

Analytical Services: Flow FFF – Centri FFF – Thermo FFF – Grav FFF – MALS – DLS – ICP-MS

Application Method Development using Flow, Centrifugal, Thermal and Grav Field-Flow Fractionation hyphenated online to RI, UV, FLD, MALS, DLS and ICP-MS for Molar Mass and Size Characterization of Biomacromolecules, Polymers, Proteins and Particles.
Sample Analysis with Flow, Centrifugal, Thermal and Grav Field-Flow Fractionation hyphenated online to RI, UV, FLD, MALS, DLS and ICP-MS for Biomacromolecules, Polymers, Proteins and Particles.
Trainings, Workshops and Seminars about Flow, Centrifugal, Thermal and Grav Field-Flow Fractionation hyphenated online to RI, UV, FLD, MALS, DLS and ICP-MS for Biopolymers, Proteins and Particles.

Analytical Supplies: GC – CE – LC – SEC – FFF – UVis – FLD – ICP-MS – AAS

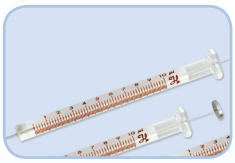
Leading Quality Brand Chromatography Consumables and Analytical Supplies from a Single Source

Fittings & Tubings

UPCHURCH® SCIENTIFIC

Chromatography Supplies

Agilent Technologies
Channel Partner



Syringes

HAMILTON

Valves

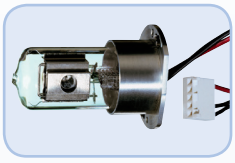
RHEODYNE

Peristaltic Pumps

ISMATEC®

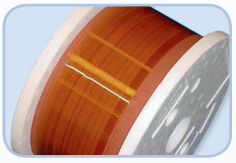
Filtration

MERCK MILLIPORE



Spectral Lamps

POSTNOVA

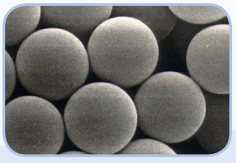


Fused Silica Capillaries

POSTNOVA

Vials

POSTNOVA



Particles & Polymers

POSTNOVA

POSTNOVA
Leading in FFF

Contacts

Worldwide Locations and Offices

HEAD QUARTERS

Postnova Analytics GmbH
Max-Planck-Strasse 14
86899 Landsberg, GERMANY
Tel: +49 8191 985 688-0
Fax: +49 8191 985 688-99
info@postnova.com
www.postnova.com

UNITED KINGDOM

Postnova Analytics UK Ltd.
Unit 56, The Hop Store,
Bishops Frome,
Herefordshire, WR6 5BT, UK
Tel: +44 1885 475007
info-uk@postnova.com
www.postnova.com

NORTH AMERICA

Postnova Analytics Inc.
230 South, 500 East, S. 120
84102 Salt Lake City, USA
Tel: +1 801 5212-004
Fax: +1 801 5212-884
info-us@postnova.com
www.postnova.com

SCANDINAVIA

Postnova Northern Europe
P.O Box 44
01721 Vantaa, FINLAND
Tel: +358 9 854 551-0
Fax: +358 9 854 551-51
norlab@norlab.fi
www.norlab.fi