AF2000 HT Series

High Temperature AF4

postnova analytics

High Resolution Polyolefin Separator

Technical specifications are subject to change without further notice.

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AF2000 HT SERIES

Specifications

- Measurement Range:
  Polymers: 104-109 Da
  Nanoparticles: 1 nm-10 µm
- Channel Cartridge System:
  - New Ceramic-Stainless Steel composite channel
  - Lower Membrane cut-off: 5x104 Da (polystyrene)
  - Inner Volume: 0.5 -1.5 mL depending on spacer
  - Inner Channel Heigh 350 µm
  - Outer Dimensions: 335 x 60 x 40 mm
- Applicable Solvent Systems:
  - Organic: TCB and other typical organic solvents
  - Aqueous: Polar aqueous solvents may be used for certain applications
- Connected Detector Systems:
  The same which are used in HT GPC can also be used in HTFFF:
  - Low/Right/Multi Angle Light Scattering for MW/Rg
  - Viscometric Detection MW/Rh
  - RI for Concentration
  - Infrared Detection for Polyolefin Concentration
  - Other Technologies possible
- Flow Rates / Pressure Ratings:
  Detector flow from channel outlet 0.01-2.0 mL/min
  Cross Flow 0 -10 mL/min;
  Channel is pressure up to 50 bar
- Required Analysis Time:
  Typically 10-20 min
- Electrical Power Requirements:
  230V, 50Hz: Min-Max / 1.2 kW-3.6kW at 6.3-15,6A
  110V, 60Hz: Min-Max / 0.6 kW-1.8kW at 6.3-15,6A
- PC Requirements:
  Windows OS, min.1024 MB RAM, 2 Ethenet ports
- Software System:
  Unique NovaFFF software plat form for complete system con trol (autosampler, pumps, detec tors), data acquisition (detector signals, pressure, flows) and data evaluation as well as reporting functions
- Typical Injection Volume:
  10-1.000 µL with autosampler injection and 10-10.000 µL with manual injection;
- Injected Sample Mass:
  Typically injected sample mass is 10-100 µg. Maximum sample mass up to 500 µg

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Asymmetric Flow Field-Flow Fractionation, also called AF4, is a new technology for the efficient separation and characterization of polymers and nanoparticles in a fast and gentle way. The AF4 technology was first commercialized by Postnova in 1996/1997. In 2004 Postnova introduced the AF2000 Series platform, using this unique AF4 technology in various systems for different applications. All AF2000 Series instruments are based on the same patented technology and are using the same principle channel set-up. In 2006 the newest member of this group, the High Temperature Asymmetric Flow FFF (Model AF2000 HT), was presented. The new patented ceramic membrane of the AF2000 HT marks a real break-through in FFF science. This special membrane opens a complete new field of applications which now can be targeted by FFF and overcomes the current limitations of traditionally used polymeric membranes of other systems. Inside the HTFFF this membrane technology can be used for the characterization of high molar mass polymers at elevated temperatures up to 220°C.
Because of several integrated patents, the Postnova AF2000 Series platform is the most advanced AF4 technology available on the market today, making it the benchmark for the industry and delivering the maximum performance possible. The AF2000 Series has the highest separation power, the most advanced channel technology and can be used for more applications than any other FFF device. Only a single software platform system is used for controlling the different FFF and detector systems and to acquire and evaluate the collected data. The system has a large, nearly universal separation range, from polymers to nanoparticles. It outperforms HTGPC especially in the range of high molar mass polymers, because the separation occurs based on the diffusion coefficient in the open flow channel without any stationary phase.

UNIQUE FEATURES OF AF2000 HT

Ceramic Membrane Channel Cartridge

The channel cartridge used in the AF2000 HT systems, is based on Postnova's new ceramic composite membrane technology (Patent pending). This membrane is inert, high temperature stable and can be regenerated many times before it needs to be replaced by a new cartridge.

Broad Molar Mass Separation Range

HTFFF can separate polymers up to molar masses of 109 Da, which is not possible with HTGPC. The technology shows no size exclusion as in HTGPC, making HTFFF the ideal tool for the separation of large and ultra-large polymers.

Gentle Separation Conditions

Because of the open channel geometry and the absence of any stationary phase the separation can be performed without shear forces and stress induced onto the macromolecule. Typical HTGPC problems, such as filtering, adsorption effects, shear induced chain degradation and late elution effects, are avoided by HTFFF.

Patented Cross-Flow Control

The system has a special patented cross-flow control interated, using a unique dual syringe pump module with non-pulsing flow delivery for most precise separation conditions. The completely inert cross flow path is made of glass/teflon/stainless steel and thus allows the use of a variety of different organic solvents at high temperatures. The cross-flow is established without any time delay or hysteresis and the general rugged design avoids problems with plugging and corrosion. Furthermore, by using the syringe pump technology, a superiour flow rate range can be accessed.

Patended FOCUS Technology

The AF2000 HT incorporates the patented FOCUS technology, which is necessary in order to ensure a continuous and constant detector flow at any time. This is one reason for the high recovery, resolution and sensitivity of the AF2000 HT system. Using the Focus technology also now makes it possible to successfully couple flow sensitive detectors, such as viscometers and RI detectors to HTFFF.

NovaFFF Software Platform

Postnova offers a unique single software platform, which integrates the system control, data acquisition and evaluation of the different FFF/LS systems in one product. The software incorporates an advanced Light Scattering module for data acquistion, data evaluation and special molar mass and particles size calculations.

APPLICATIONS OF AF2000 HT

Polyethylene : LDPE, LLDPE, HDPE, UHMWPE
Polypropylene : Polypropylene in its different variations
HTFFF in general, is the ideal choice for high and ultra-high molar mass polymers.