

ACQUITY RI Detector

Low-dispersion, refractive index detection for UPLC and APC has arrived



The ACQUITY RI Detector.

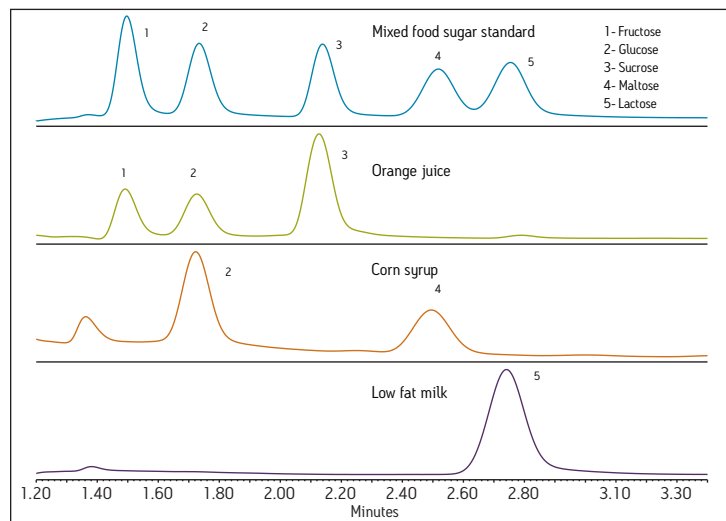
ENABLING FASTER SEPARATIONS, WITHOUT COMPROMISING DATA QUALITY

The key to UPLC® and APC™ separation quality is minimizing the overall system dispersion. Historically, refractive index detection has had very high dispersion due to the higher volumes needed to stabilize the detector response. Therefore, adapting refractive index detectors to low-dispersion LC instrumentation demands specific attention not only to volume reduction, but also to maintaining a high degree of temperature stability, all while ensuring critical performance attributes, such as low baseline noise and a wide-linear dynamic range, are not compromised.

The ACQUITY® Refractive Index (RI) Detector has addressed these challenging technical and environmental hurdles by providing accurate and precise detection for your non-UV absorbing analytes, delivering unrivaled quantification for your UltraPerformance LC® and Advanced Polymer Chromatography™ applications.

Get faster answers for your quality control applications

Laboratories around the world have deployed UPLC technology to improve data quality and throughput by reducing analysis run times and increasing chromatographic resolution, making integration and quantification easier and more reliable. These same benefits can now be realized for samples that contain analytes that require RI detection due to the absence of a UV-chromophore.



Analysis of the five common food sugars in various matrices on the ACQUITY UPLC® H-Class System with the ACQUITY RI Detector in under four minutes.

Universal detection for your non-UV analytes

Combine the ACQUITY RI Detector with your ACQUITY System to improve resolution and throughput for your isocratic applications, including:

- Advanced Polymer Chromatography (APC)
- Food QC Applications
- Pharmaceutical USP Methods
- Industrial Process Monitoring

INNOVATIVE TECHNOLOGY FOR THE CHROMATOGRAPHIC LABORATORY

Minimized dispersion enhancements

- Flow cell volume of 1.3 μL to preserve narrow UPLC peak volumes
- Maintains excellent peak shape
- High energy throughput for maximum sensitivity

Refined thermal management

- Countercurrent heat-exchanger balances the temperature of in-coming solvent to reduce baseline drift
- Optics housed in a thermally isolated compartment to minimize environmental fluctuations

Integrated fluidic management

- Integrated solvent recycle valve empowers you to reduce costly solvent consumption and is method programmable
- Automatic reference cell purging to maintain optimal baseline performance

Enhanced control and diagnostics

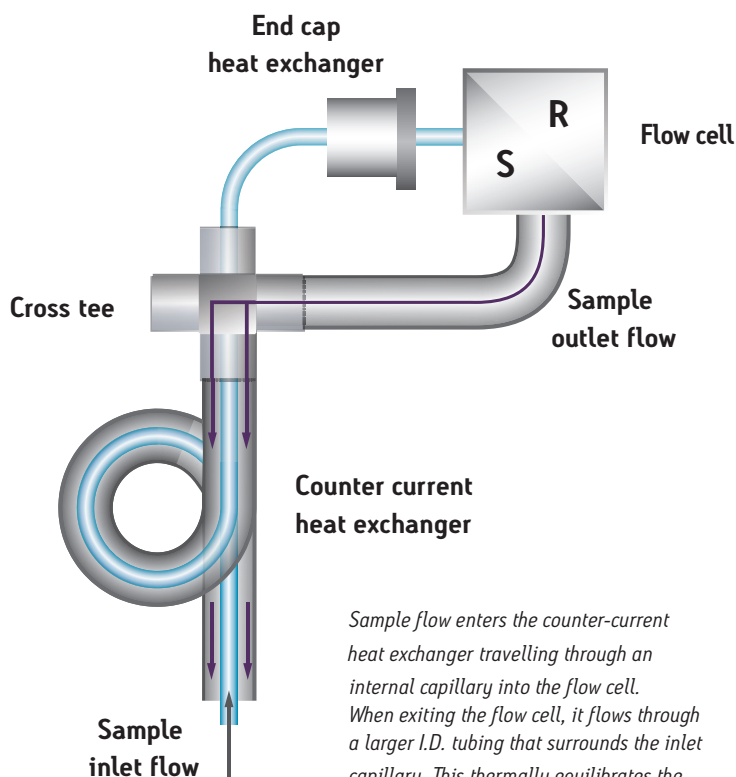
- Equipped with a customizable instrument console giving you access to control, set-up, and status monitoring features
- Simple navigational approach
- Diagnostic features at your fingertips

Enhanced data acquisition

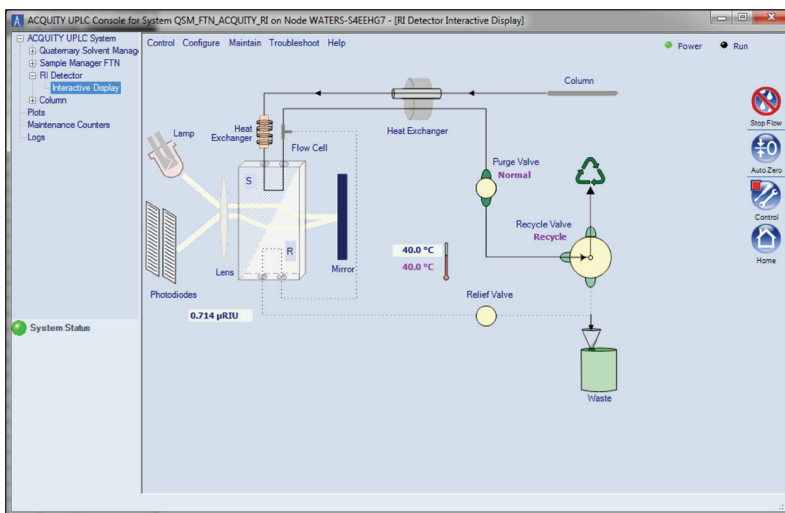
- Sampling rates from 1 to 80 points/s to ensure accurate definition of your narrow UPLC peaks
- Independent optimization of filter time constants and sampling rates delivers the best combination of sensitivity and resolution for your application

Enhanced sensitivity

- High energy LED delivers exceptional energy transmittance through the flow cell
- Long-lifetime lamp with consistent performance



Sample flow enters the counter-current heat exchanger travelling through an internal capillary into the flow cell. When exiting the flow cell, it flows through a larger I.D. tubing that surrounds the inlet capillary. This thermally equilibrates the incoming sample-flow temperature, and dramatically minimizes drift.

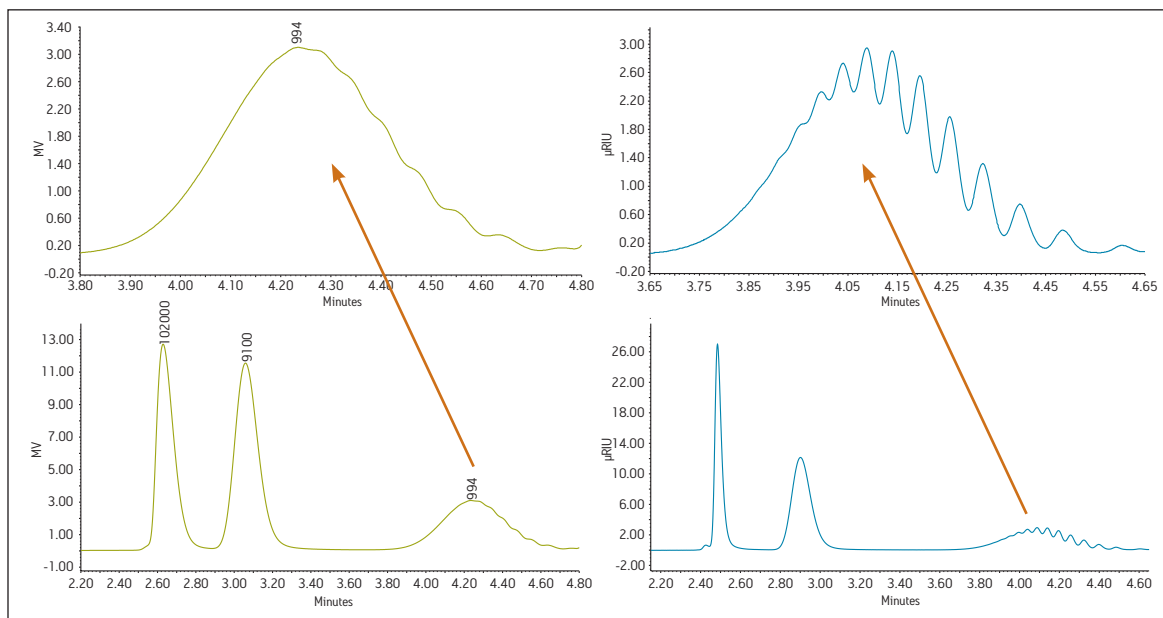


The ACQUITY RI Detector interactive display within the Instrument Console.

A KEY COMPONENT FOR ADVANCED POLYMER CHROMATOGRAPHY... LOW-DISPERSION DETECTION

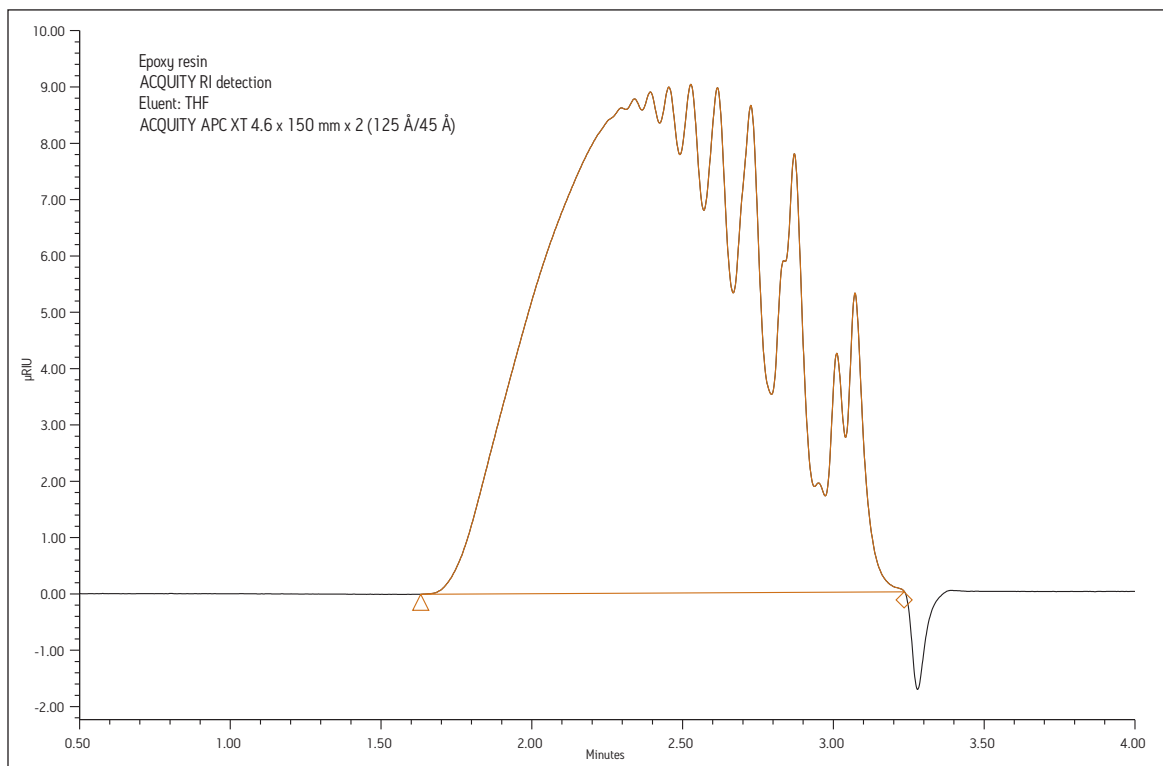
The ACQUITY Advanced Polymer Chromatography (APC) System defines a new category of chromatographic polymer analysis that gives you more information about your polymers, faster than ever before. Combining low-dispersion system fluidics with rigid, small particle columns of a wide range of pore sizes, the system defines the ultimate in polymer peak resolution, particularly for low molecular weight oligomers.

One of the key enablers of this break-through technology is low-dispersion, refractive index detection. GPC applications are typically limited to larger I.D. columns due to the impact of the detector's dispersion on the resolution of the polymeric peak. The effect of system dispersion can result in incorrect molecular weight averages and polydispersity measurements. However, the low dispersion in the ACQUITY RI Detector makes it entirely compatible with narrow, high resolution APC columns, which promotes reduced solvent consumption and provides unprecedented resolution of low molecular weight polymers.



The same 10^3 to 10^5 polystyrene standards were run on an ACQUITY APC System with a standard HPLC refractive index detector [A], and the ACQUITY RI Detector [B].

The loss in resolution due to the HPLC detector volume is clearly evident when zoomed in to the 10^3 standard. When the HPLC detector is used, all of the resolution of the low MW oligomers is lost to the HPLC detector's dispersion.



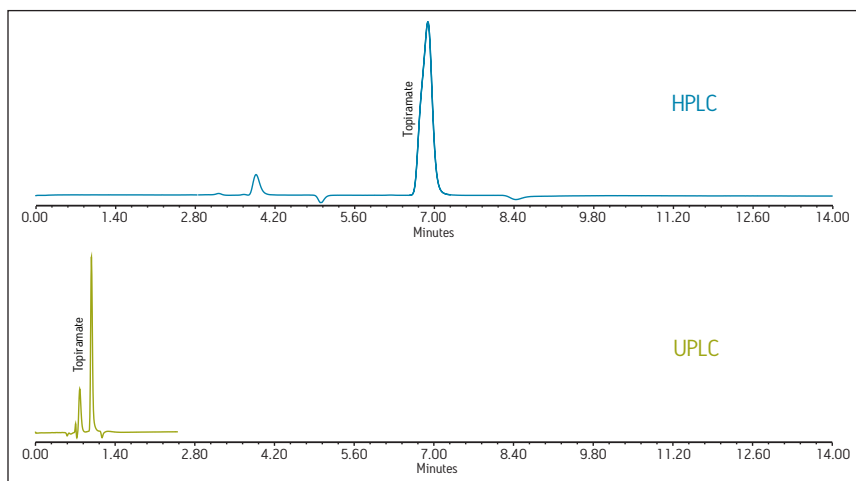
The high-resolution separation achieved with the ACQUITY RI Detector on an ACQUITY APC System provides better characterization of low MW polymers and their oligomers, such as this epoxy resin.

SIMPLIFIED METHOD TRANSFER - TAKE YOUR CURRENT HPLC/RI METHODS TO THE NEXT LEVEL

The benefits of transferring your existing HPLC methods to UPLC have been demonstrated time and time again, across multiple application types. Now, HPLC methods that require refractive index detection can also be seamlessly transferred to UPLC. Intuitive tools, including the ACQUITY UPLC Columns Calculator and the Reversed-Phase Column Selectivity Chart, are available to help you select the proper UPLC stationary phase and scale your existing HPLC/RI methods to your UPLC/RI system.

Benefits of UPLC Analysis:

- Improved chromatographic resolution
- Increased sample throughput
- Reduced solvent consumption and cost per analysis



The transfer of the HPLC USP method for Topiramate to the ACQUITY UPLC H-Class System with the ACQUITY RI Detector has resulted in an 80% reduction in runtime while maintaining equivalent chromatographic performance.

BE ASSURED.

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The ACQUITY UPLC H-Class System with the ACQUITY RI Detector.

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