

Thermo Scientific Vanquish Flex UHPLC System

Outstanding Long-term Reproducibility for Utmost Data Confidence

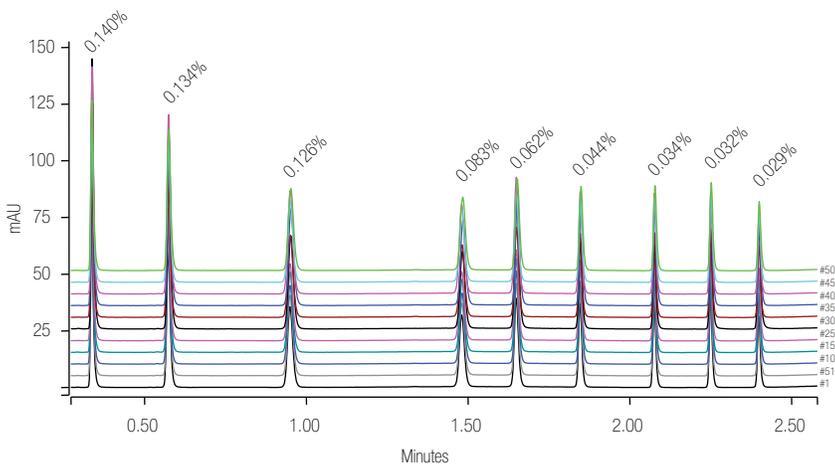
Product Spotlight

No matter what questions need to be answered, all chromatographers rely on the reproducibility of their UHPLC system. Superior retention time and peak area precision is of paramount importance for data confidence, as well as the instrument's ability to produce consistent results every single time. The Thermo Scientific™ Vanquish™ Flex UHPLC system has been designed to fulfill these needs.

Vanquish Flex System – Expanding the Vanquish UHPLC Portfolio

The Vanquish platform is designed to fulfill the performance and throughput demands of modern laboratories. The entire Vanquish pump portfolio features the industry-leading SmartFlow™ pumping technology with automatic compensation for changing eluent compressibility. In addition, the autosampler pre-compresses the sample prior to the injection, which eliminates virtually any flow inconsistencies during sample injection. The pre-pressurization also protects the column from pressure shocks, extending the column lifetime.

The thermostatted column compartment contributes to the overall system reproducibility by providing very accurate temperature control and an independent active pre-heating of the eluent. The combination of these thermostating technologies ensures the highest consistency of the separation temperature, resulting in highly precise retention times while also providing maximal chromatographic efficiency.



Column: Thermo Scientific™ Accucore™ C18, 2.6 μm, 2.1 x 100 mm
Eluent A: Water
Eluent B: Acetonitrile
Flow Rate: 735 μL/min
Gradient: 0-1.2 min from 40 to 100% B, 1.2 -1.6 min 100% B, 1.6-5 min 40% B
Temperature: 40 °C Still Air

Figure 1: Stacked overview plot of 11 chromatograms spanning a sequence of 500 injections.

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Long-term Stability Without Any Compromise to Data Quality

A total of 500 injections were performed in a long-term stability test on the Vanquish Flex UHPLC system. The system consists of a Vanquish quaternary low-pressure mixing pump, a Vanquish Flex autosampler, a Vanquish column compartment and a Vanquish Diode Array Detector. The retention time stability and separation consistency over all injections was used to demonstrate the long-term stability of the system.

Figure 1 shows the chromatogram of every 50th injection out of a series of 500 subsequent runs. The retention time trend is plotted for each component over all 500 injections in Figure 2. No variation in retention times can be observed for any of the analyzed compounds demonstrating the outstanding instrument and column robustness. The relative standard deviation of the retention times was maximal 0.140% for the least retained substance and as low as 0.029% for the last eluting compound.

The primary reasons for this superior stability are the interaction of the Vanquish pump with the Vanquish autosampler as well as the accurate column thermostating. In addition to the SmartFlow technology, a synchronization of the quaternary pump pistons with the injection process ensures exactly the same solvent composition at the injection of each individual sample.

The combination of these Vanquish system inherent technologies guarantees the highest reproducibility, even for the most demanding chromatography analyses. This work and another long-term stability study of the Vanquish system¹ demonstrate the ability of the Vanquish platform to provide the data confidence and the stability chromatographers need today.

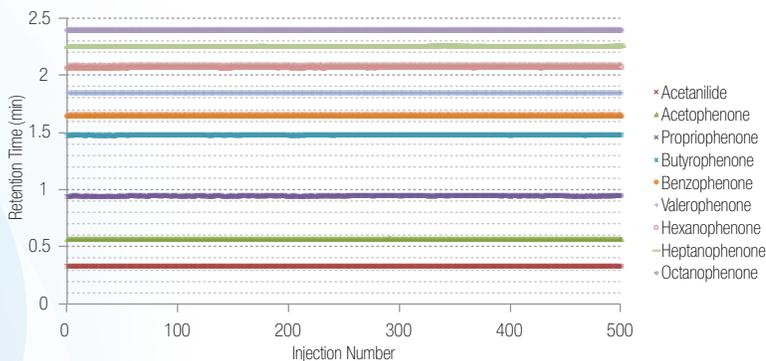


Figure 2: Plotted trends of retention time for each component over all 500 injections shown in Figure 1.

Reference:

1. Thermo Scientific Application Note 1123: Increased Long-term Stability of Peptide Mapping using the Vanquish UHPLC System. Germering, Germany, 2015.