

# Measuring & Analytical Instruments

## 1 VS1800 Nano 3D Optical Interferometer

A requirement during the research and development of industrial products, and for their quality inspection once in production, is to be able to measure the surface quality of the parts and materials used. The challenge, however, as the performance and functionality of these products improves, is that high levels of resolution and precision are required for these measurements. There is also strong demand for making measurements faster and easier to perform.

In response to these requirements, Hitachi has launched the VS1800\* nano 3D optical interferometer. The VS1800 uses the principle of optical interference to measure surface quality over a wide area (up to 6.4 mm) in just a few seconds, achieving vertical resolution of 0.01 nm, equivalent to that of a scanning probe microscope (SPM). Its capabilities also include the cross-sectional measurement of multi-layer transparent film, providing noncontact/nondestructive detection of things like film thickness and the presence of delamination or impurities in the film.

The VS1800 also expands the scan range and sample thicknesses compared to the scanning white light interferometric microscopes supplied in the past, being able to measure heights of up to 10 mm on samples with thicknesses up to 100 mm. In other words, the VS1800 can perform height measurements from the nanometer to the millimeter scale.

(Hitachi High-Technologies Corporation)

\* The VS1800 is only available in Japan, China, and Taiwan.



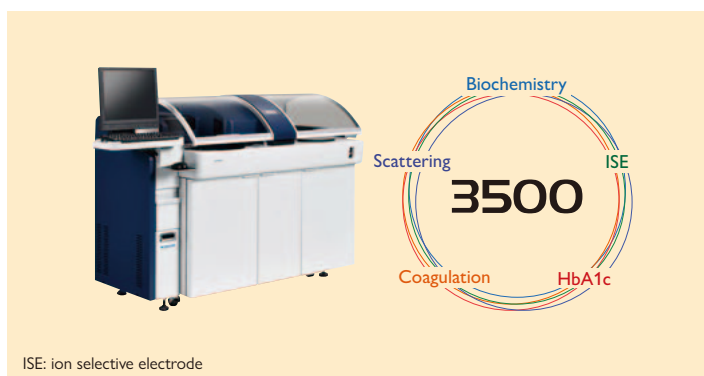
1 VS1800 Nano 3D Optical Interferometer

## 2 3500 Multi-function Automatic Blood Analyzer

Disease diagnoses by practitioners in medical institutions are conducted based on the analysis of multiple test results for a wide variety of test items. Blood testing, one of the commonly conducted laboratory tests, involves a wide range of test items with a plurality of analyzers, and accordingly on-site laboratory technicians strongly demand ways to make their clinical work more efficient.

In response to those requirements, Hitachi High-Technologies Corporation has launched the 3500 Multi-function Automatic Blood Analyzer, which is integrated to perform five different types of tests including those that are available on existing instruments, i.e. biochemistry assays, electrolyte and HbA1c analysis, in addition to those that are newly implemented, i.e. immunoassay and blood coagulation testing.

The light-scattering photometer newly developed for immunoassays enhances sensitivity at low concentrations, being used in tandem with the results of absorption photometer measurement, to realize operation in a wider measurement range from low to high concentrations. Meanwhile, the coagulation test analysis features higher actual throughput using our distinctive operation sequence wherein biochemistry analysis and coagulation analysis are combined.



2 3500 Multi-function Automatic Blood Analyzer

With its ability to perform five different types of testing in a single instrument that is similar in size to the previous analyzers, the 3500 contributes to higher efficiency and workflow improvement in clinical laboratories.

(Hitachi High-Technologies Corporation)

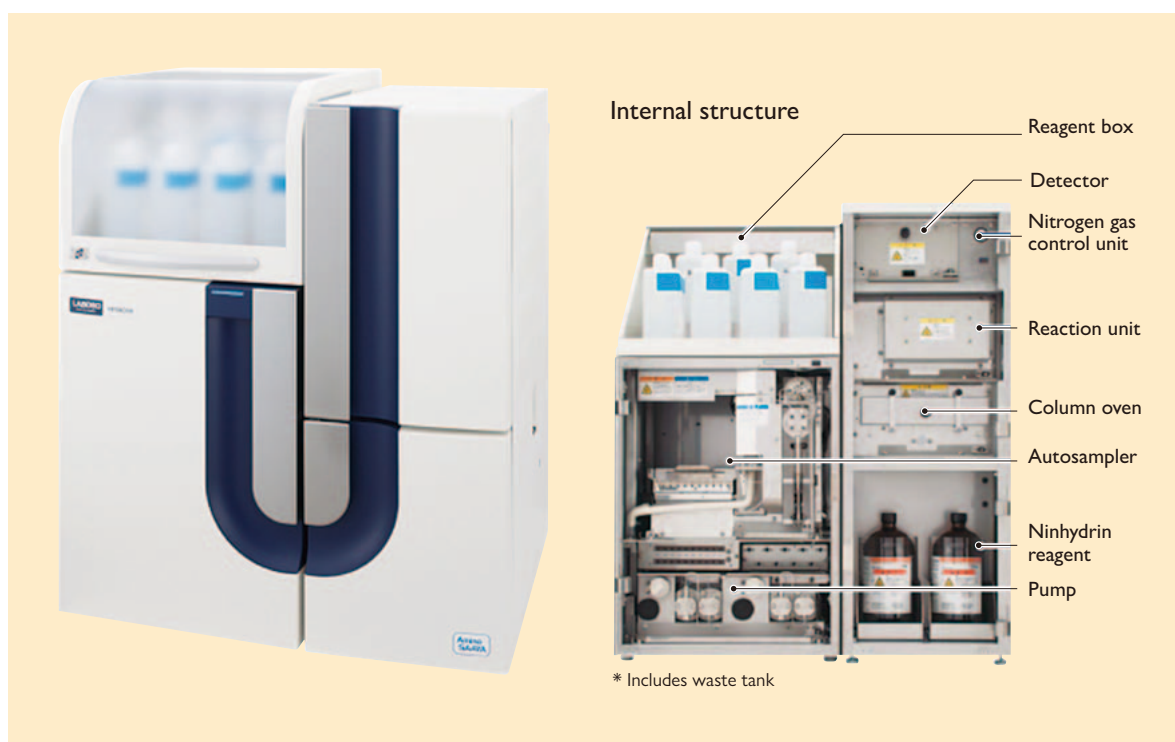
### 3 New Deployment of Benchtop Type Amino Acid Analyzer

The newly developed LA8080 represents the eighth generation of Hitachi amino acid analyzers, which date back to the KLA-2 model launched in 1962 that was the first such instrument to be produced in Japan. The analyzer uses the ion exchange chromatography technique devised by Dr. Stanford Moore and Dr. William Stein, both winners of a Nobel Prize in Chemistry, that uses post-column derivatization with a ninhydrin reagent. Rather than ultra high performance liquid chromatography (UHPLC) and all the various other techniques that have been proposed, the reason why ninhydrin has become the standard method for amino acid analysis in industries such as food and pharmaceuticals is because of the high reliability of the data, underpinned by the stability of the reaction with the reagent.

The new LA8080 is an enhancement of the freestanding designs used in the past, making it the first such instrument to be supplied as a benchtop unit. Its compact design is also about 30% smaller in terms of installation footprint. The design of the LA8080 takes account of ergonomic factors such as how it is operated and the sight lines during user operation, being designed for ease of use, including optimization of the height of reagent bottles and the placement of reagent vials. The new model also retains the analysis methods available on the previous L-8800 and L-8900 models, achieving good quantitative precision.

Amino acid analysis can be used in two different ways. One involves the analysis of the products of protein hydrolysis in which hydrochloric acid is used to break the protein up into its individual amino acids to allow quantitative determination of the amino acid composition. The other is a quantitative analysis of the amino acids and amino acid analogs in physiological fluids such as blood serum or urine taken from animals. As the analysis of taurine (Tau),  $\gamma$ -aminobutyric acid ( $\gamma$ -ABA), and ornithine (Orn) is also possible, applications include quality control for health supplements.

(Hitachi High-Tech Science Corporation)



3 LA8080 High Speed Amino Acid Analyzer and its internal structure