

Healthcare & Analytical Systems

1 Contributing to Healthcare through a Medical Solution Services Platform

In clinical testing that supports healthcare, there is a need to improve the quality of test data and the efficiency of lab operations. Hitachi High-Tech Corporation has developed a medical solution services platform (SSP) to provide services aimed at optimizing clinical lab operations.

SSP collects the operation information of clinical labs in the cloud server to provide valuable services for stakeholders related to clinical labs. First, Hitachi will start a service to help streamline clinical lab operations and equipment maintenance. Each stakeholder can utilize applications developed through co-creation with customers to resolve problems in clinical lab operations and equipment maintenance.

In the future, Hitachi will contribute to improving the quality of healthcare and reducing medical costs by achieving higher quality and efficiency in clinical testing such as quality assurance for test data and the predictive diagnosis of equipment failures, etc.
(Hitachi High-Tech Corporation)

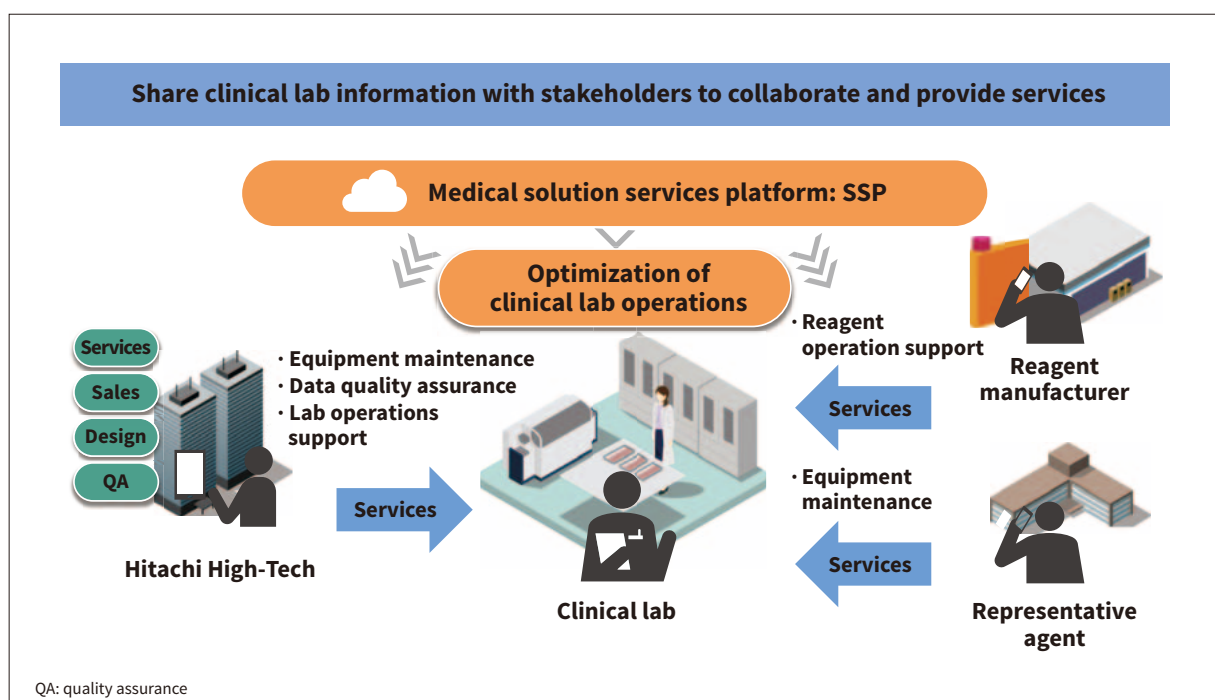
2 Medium-sized Capillary DNA Sequencer Successor Model SeqStudio Flex

Capillary electrophoresis deoxyribonucleic acid (DNA) sequencers analyze the base sequences in DNA and the length of DNA fragments, the blueprint of life. Such sequencers have come to be used by a variety of users not only for research purposes, but also for personal identification in criminal investigations, the medical and health fields, and other application markets, and there is a growing need for new applications.

To respond to this, Hitachi High-Tech has commercialized SeqStudio® Flex in collaboration with the US company, Thermo Fisher Scientific Inc. While maintaining the analysis performance of the previous 3500 Genetic Analyzer model, this product possesses the following four features as a more user-friendly instrument.

(1) Priority support for urgent samples

Supports feeding of urgent samples even during measurement, allowing users to feed in samples whenever they want, at any time.



1 Medical solution services platform concept



2 SeqStudio Flex 24-ch medium-sized capillary DNA sequencer main unit (left), capillary array (24 channels) (upper right), and capillary array (8 channels) (lower right)

(2) Increased number of installed samples

The new model can accommodate twice the number of samples as before (maximum of 1,536 samples).

(3) Easy operation

The improved capillary array, a consumable that requires careful handling, can be replaced easily and safely.

(4) Space-saving

Incorporates a touch panel to integrate the operation PC with the instrument. The install footprint is approximately half that of the previous model.

With this sequencer, the company aims to expand its business by promoting the replacement of previous models while also attracting new customers in application markets.

(Hitachi High-Tech Corporation)

*See the list of “Trademarks.”

3 Lumione BL3000 Rapid Microbial Testing System

The Lumione BL3000 rapid microbial testing system from Hitachi High-Tech Science Corporation can detect microbes in a short period of time without cultivation using a bioluminescent technique based on firefly luminescence as its detection principle. For example, while the testing of water used in the manufacture of pharmaceutical products can take 3 to 14 days with conventional cultivation methods, the Lumione BL3000 can detect microbes in one hour, and it is expected to be widely used in industries that require microbial control such as pharmaceuticals, beverages, foodstuffs, and hygiene materials, etc.

With the goal of further market expansion, the Lumione BL3000 offers higher throughput and a more compact size as well as superior cost performance that is roughly half that of the previous model. The key features are as follows.

(1) By shortening the luminescent measurement time per sample, it realizes a throughput of 24 samples per hour (double the throughput of the previous model).

(2) The dynamic range was expanded to 0 to 500,000 amol to support high-concentration samples (a two-digit increase compared to the previous model).

(3) Capable of measuring various sample solutions by retaining 10 types of calibration curves (10 times that of the previous model).

(4) Improved the calibration precision through the optimal concentration range with multipoint calibration curves (12 times the concentration number of the previous model). Going forward, the company aims to expand into regenerative medicine and other new fields where future growth is expected.

(Hitachi High-Tech Science Corporation)



3 Lumione BL3000 rapid microbial testing system

4

UH5200/UH5210 Spectrophotometers

Spectrophotometers are used in research and development and testing in a wide range of fields from optical components and construction materials to chemistry, pharmaceuticals, foodstuffs, and the environment. Hitachi productized the UH5200 spectrophotometer as an instrument which is easy even for beginners to understand and use to provide a smooth measurement environment for applications for which optical characteristics are measured in the ultraviolet-visible (UV-VIS) range.

This product is equipped with a measurement condition shortcut feature and a sample name barcode reader input feature. In addition, it incorporates new design graphics with superior visibility to realize a comfortable operating environment. Moreover, it supports many accessories^{*1} such as an autosampler, autosipper, and micro-cells, which can be applied to measurement automation and a wide range of applications. The key features are as follows.

- (1) A standalone model (UH5200) and a PC-controlled model (UH5210) are provided according to the intended application.
- (2) Incorporates a 10.4 inch large-sized/high-resolution liquid crystal display not found on competing products.
- (3) Supports commercially-available thermal paper printer and USB printers^{*2}.

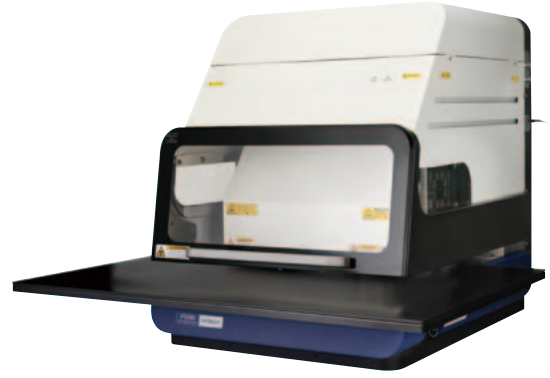
(Hitachi High-Tech Science Corporation)

*1 Product sold separately

*2 Supported models are limited.



4 UH5200/UH5210 spectrophotometers



5 FT230 high-volume X-ray fluorescence coatings and materials analyzer

5

Smarter X-ray Fluorescence for Coating Thickness and Composition Measurement

Coatings analysis with X-ray fluorescence (XRF) is a long-established practice for verifying the thickness and composition of coatings applied to critical electronic and mechanical components. This testing is essential for ensuring the components reliably perform as specified as well as for cost and resource control in production, as frequent testing can quickly identify defects and help reduce excessive use of common expensive coating materials such as gold or platinum.

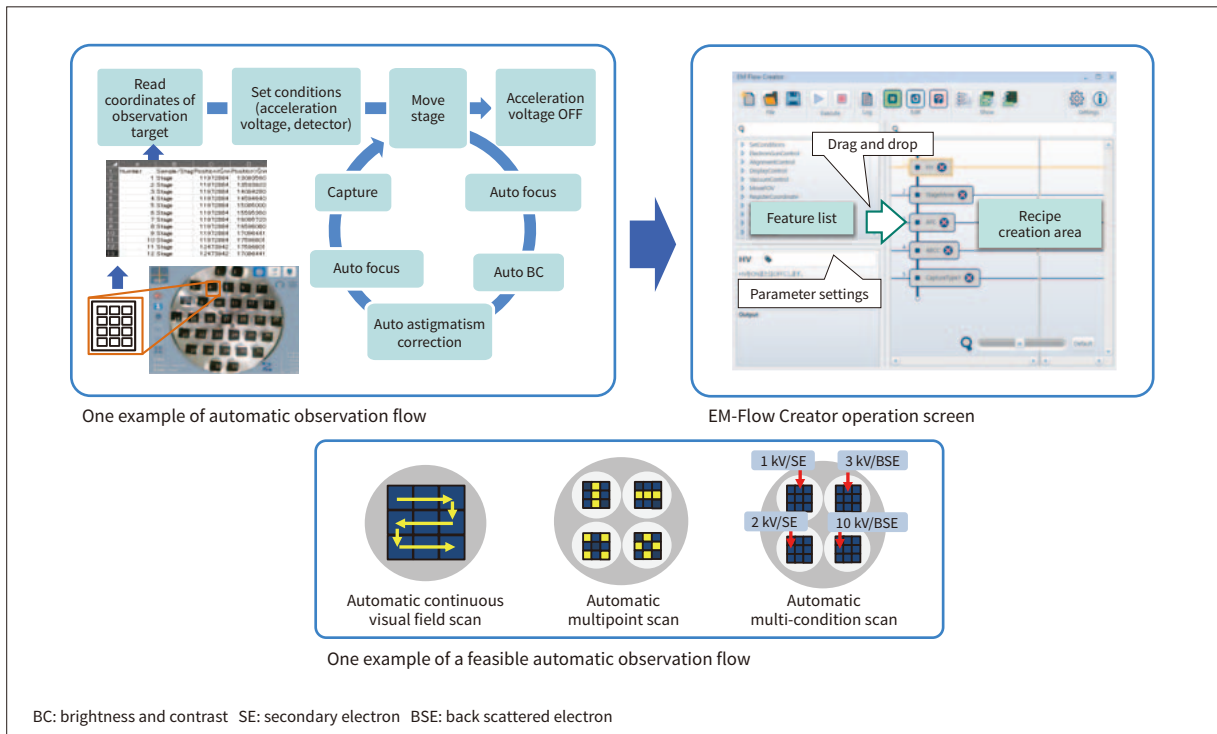
There is growing demand in the automotive, aerospace, medical, communications, and other industries to perform 100% inspection at the component level, which adds more load on XRF analyzers and operators in production control and quality control. With XRF coatings analysis, the measurement step that takes the longest is typically not the analysis, but sample presentation—locating areas to be measured, aligning (focusing) the part, and selecting analytical parameters. Hitachi High-Tech Analytical Science Ltd. has combined advanced features including an operational support function and new machine vision technology called Find My Part to simplify measurement setup and significantly reduce the amount of time spent by operators making decisions. This enables the production facility to test many more parts in less time, avoid mistakes, reduce scrap, and reduce energy and material consumption.

(Hitachi High-Tech Analytical Science Ltd.)

6

EM Flow Creator SEM Automatic Data Acquisition Support Feature

With advances in information processing technologies, data-driven research and development, which requires



6 Overview of EM Flow Creator

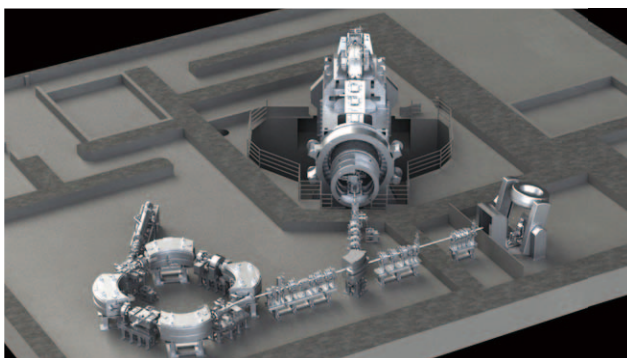
the acquisition of large amounts of data, is being promoted in various fields such as semiconductors, materials, and life sciences. In the field emission-scanning electron microscopes (FE-SEM) that are widely utilized for the purpose of observing and analyzing the microstructure of samples as well, there is a need to acquire large amounts of data in a short period of time and to reduce the operational burden on the user.

The recently developed EM Flow Creator is software for creating and executing scanning electron microscope (SEM) observation recipes that incorporates visual programming technologies. For SEM observation recipes, a series of automatic observation recipes can be easily created by selecting the necessary features from a feature list, arranging them by dragging and dropping them into the recipe creation area, and setting the SEM parameters.

The easy-to-operate user interface enables the rapid creation of diverse observation flows and enables the acquisition of a large volume of data with stable and continuous operation. This software is expected to reduce the operational burden on users and promote further data acquisition and analysis. EM Flow Creator can be installed on two FE-SEM models, SU8600 and SU8700. (Hitachi High-Tech Corporation)

7 Development of Advanced Proton Beam Therapy System

In addition to proton beams, the utilization of carbon ion beams is advancing in particle therapy systems, and diverse needs are emerging. Thus far, Hitachi has globally



7 Image of the proton beam therapy system (left figure) equipped with a rotating gantry (center) and the UPPS (right) and the UPPS from Leo Cancer Care (right figure)

deployed an extensive range of proton beam and carbon ion beam therapy system solutions.

The company is developing an advanced proton beam therapy system that combines Hitachi's proton beam therapy system with an upright patient positioning system (UPPS) from UK company, Leo Cancer Care Ltd. In existing particle therapy, patients are typically required to lie down on the patient couch. However, enabling treatment in an upright orientation on a patient positioning

chair, which is a more natural way, can be expected to improve the workflow and reduce the treatment time while also alleviating the burden on the patient. Moreover, because the system uses a smaller installation footprint for the therapeutic device than that of the facilities with multiple rotating gantry treatment rooms, it reduces the building volume while also leading to a reduction in implementation costs.