

LAB-X5000 Series

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LAB-X5000 for the rapid analysis of plating solutions

BACKGROUND

The monitoring and control of the metallic content of electroplating solutions are critical to the coatings process. If the metals' concentrations in the plating baths are too high or too low, the process is likely to deliver poor surface finishes such as blistering or uneven colouring, and have a detrimental effect on the coated parts' properties. The requirement for a rapid, simple analysis (carried out by non-laboratory staff) on site makes energy dispersive X-ray fluorescence (EDXRF) spectrometry the ideal analytical technique.

Benchtop energy dispersive X-ray fluorescence (EDXRF) analysers such as the LAB-X5000 can be found in many treatment facilities and development labs with the instruments often operated by production staff on a 24/7 basis, providing accurate results day after day. EDXRF is well regarded for its excellent performance, ease of use, versatility, speed and cost effectiveness.

PLATING SOLUTIONS ANALYSIS MADE EASY

With the Hitachi High Tech LAB-X5000 energy dispersive X-ray fluorescence (EDXRF) analyser, the analysis of plating solutions couldn't be easier. This rugged, compact analyser is designed to provide reliable and reproducible results in laboratories, production environments and mobile inspection operations. The intuitive user interface is displayed on a large, industrial touch screen. Routine analysis is carried out by placing the sample cup in the analysis port and pressing a button to start the measurement. Preliminary results are displayed within seconds, allowing users to make process adjustments decisions fast.

The LAB-X5000 includes several features that help protect against damage caused by sample spills or leaks. Sample cups fit inside a secondary safety window that contains leaks from the cup. These windows are fitted with Mylar® film. They are re-usable and the film can be changed in seconds (no need for a tool). The Lab-X includes an automated turntable that only places the sample above the X-ray tube and detector for the duration of the analysis, minimising the risk of damage or contamination to critical components. And an audible alert is generated when the analysis is finished to remind users that the sample should be removed.

The LAB-X5000 provides full data handling flexibility: connect via WiFi to ExTOPE Connect, our cloud-based service to upload and manage results anytime, anywhere; store up to 100,000 results and spectra on-board the analyser; print them on the integrated printer or export them on a USB memory device. The choice is yours.



SAMPLE PREPARATION

The sample preparation is simple: just pour the solution into a sample cup fitted with Mylar® film, place it in the safety window in the LAB-X's analysis port, and press the Start button.



PERFORMANCE AND RESULTS

The LAB-X5000 can be used to determine the composition of single and multi-elements solutions. The data shown in this section highlights the typical performance that the LAB-X delivers. A simple empirical calibration was created for each application, by measuring a series of solutions with known composition to establish the relationship between metal content and X-ray signal.

Each solution was measured for 60 seconds.

Note: Users can develop their own calibrations as required, with the assistance of our applications engineers when/if needed.

Table 1: Typical calibration performance for single and multi-element solutions.

Analyte	Concentration range (g/l)	Standard error of calibration (g/l)	Measurement time (s)	Precision at mid-range (95 % confidence) (g/l)
Sn	0 - 50	0.3	60	0.08
Ag	15 - 35	0.3	60	0.04
Zn (in ZnNi solutions)	0 - 15	0.1	60	0.09
Ni (in ZnNi solutions)	0 - 2.5	0.1		0.01

SUMMARY

Once calibrated (a simple procedure), Hitachi High-Tech's LAB-X5000 provides accurate and repeatable solution analysis for a wide variety of electroplating applications. The LAB-X's ease of use and ruggedness make it an ideal tool on the shop floor for plating process control. With results available in seconds, the baths' chemistry can be adjusted rapidly, preventing the rejection of plated parts that do not meet specifications, maximising productivity and savings costs.



ORDERING INFORMATION MINIMUM REQUIRED:

- | LAB-X5000 analyser with Pd target x-ray tube
- | Basic accessories pack LX5K-PACK1: power cord, printer paper, secondary safety windows etc.
- | Accessories pack LX5K-PACK3: acid-resistant sample cups, 100 disposable inners and 100 lids, rack for sample cups
- | Hitachi High Tech 6 μ m Mylar film (part number 54-L70)

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Visit www.hitachi-hightech.com/hha for more information.

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