APPLICATION NOTE - 04

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LAB-X5000

LAB-X5000 for analysis of wood preservatives

BACKGROUND

Among numerous building materials, wood is ideal as it is renewable, strong and easily shaped. Its biggest inconvenience is that it is vulnerable to decay and insects. To make it more durable, wood is usually pressure-treated with wood protection solutions that have insecticide, fungicide and herbicide properties.

Two widely used wood protection chemistries are chromated copper arsenate (CCA) and ammoniacal copper quat (ACQ). Additional preservatives available for a range of performance characteristics and applications include pentachlorophenol (penta), ammoniacal copper zinc arsenate (ACZA) and iodopropynyl butyl carbamate (IPBC).

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 conforming to accepted test norms. EDXRF is well regarded for its excellent performance, ease of use, versatility, speed and cost effectiveness.

Analyte	Concentration range (%)	Standard error of calibration (%)	Measurement time (s)	Precision at mid range 95 % confidence (%)
CrO_3	0.33 - 0.93	0.029	90	0.004
CuO	0.12 - 0.35	0.010	90	0.001
As_2O_5	0.25 - 0.70	0.020	90	0.002

Table 1. Typical calibration performance for CCA solutions.

Analyte	Concentration range (%)	Standard error of calibration (%)	Measurement time (s)	Precision at mid range 95 % confidence (%)
CrO_3	0.00 - 4.15	0.061	90	0.019
CuO	0.00 - 1.59	0.043	90	0.007
As_2O_5	0.00 - 3.02	0.079	90	0.009

Table 2. Typical calibration performance for CCA sawdust.

Analyte	Concentration range (%)	Standard error of calibration (%)	Measurement time (s)	Precision at mid range 95 % confidence (%)
Cu	0.34 - 1.89	0.023	90	0.002

Table 3. Typical calibration performance for ACQ solutions.

WOOD PRESERVATIVES ANALYSIS MADE EASY

The Hitachi LAB-X5000 energy dispersive X-ray fluorescence (EDXRF) analyser makes wood preservatives analysis easy whether in solution or treated wood. This rugged, compact analyser is designed to provide reliable and reproducible results in laboratories, production environments and mobile inspection operations. The intuitive interface is displayed on a large, industrial touch screen. Streamlined software and one-touch measurement start function are inspired by our line of point-and-shoot handheld analysers so any operator can get high quality results.

The analytical method parameters are pre-loaded on the LAB-X. They have been optimised to ensure the best performance. Method sheets are also provided to take you through the simple steps needed to complete your calibrations. Methods for additional chemistries can be developed either by the user following the convenient investigation tools and calibration setup process, or with the assistance of our applications engineers.

The LAB-X5000 includes several features that help protect against damage caused by sample spills. Sample cups fit inside a secondary safety window that contains leaks from the cup. These windows are re-usable and removable and do not require tools for assembly.

The sample is inserted into an automatic turntable that positions it for analysis then moves the sample away from the X-ray tube and detector when the measurement is complete. While the risk of a leak escaping both the sample cup and secondary containment is small, should it occur it would happen away from the analytical components. To remind users that a sample should be removed after a measurement, an audible alert is generated when the analysis is complete.

Advanced data handling capabilities include connectivity to LiveConnect, a cloud-based service for storing and managing analysis data anytime, anywhere. Locally, 100,000 results and spectra are stored on-board the analyser. Results can be printed on the integrated printer and transferred via USB.

The LAB-X brand has been trusted by the wood protection industry for decades for its reliability, ease of use, stability and ruggedness.

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