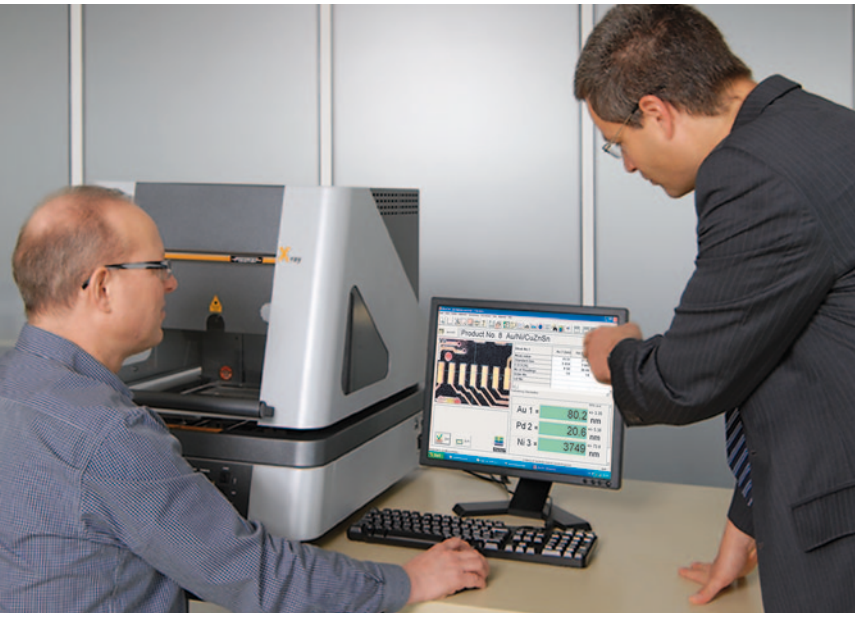
WinFTM® Software



Every X-ray fluorescence measurement device requires powerful software to make it a bona fide measuring instrument. Therefore, the FISCHERSCOPE X-RAY instruments' potential for providing optimal measurement results can only be realised in conjunction with FISCHER's innovative WinFTM Software.

WinFTM Software is the mathematical heart of all FISCHERSCOPE X-RAY instruments, enabling the collection of information regarding coating thickness and composition from the measured X-ray spectra, regardless of whether the specimens are pure element coatings, alloy coatings, combinations thereof or alloys of many elements.

Here, FISCHER leads the way, implementing in WinFTM numerically effective algorithms that are based on a life-like physical model. For this reason, all measurements can also be carried out standard-free.

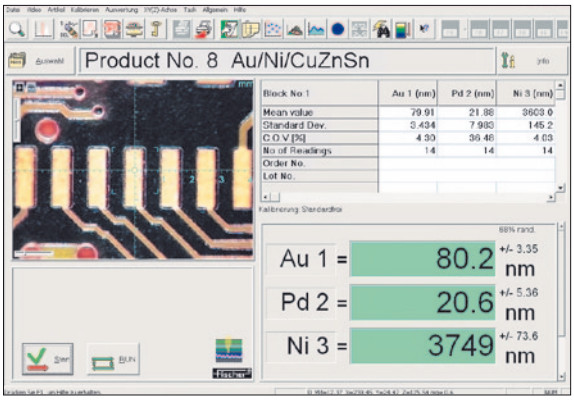
But WinFTM is more. It is also the command centre for user-friendly operation and optimal employment of the FISCHERSCOPE X-RAY measuring instruments, not only in the laboratory but also in daily industrial use.

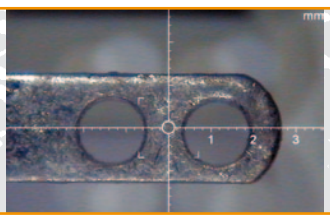
Scope of applications

From simple coating thickness measurements in the electroplating industry, such as zinc on iron, to bath analyses, complex multi-coating applications, sophisticated precious metal analyses or trace analyses (RoHS), a single software program suffices for all measuring applications: WinFTM.

User-friendly

Whether in incoming goods inspection, quality control in manufacturing, or in the material testing laboratory in governmental institutions, the operative requirements met by WinFTM are as diverse as the range of uses to which the instruments are put. Easy and intuitive control of such complex instruments is the key to the broad acceptance enjoyed by the FISCHERSCOPE X-RAY series.





Video image with crosshairs

RoHS-standards

For this reason, FISCHER has designed the WinFTM Software such that no particular training is required for routine measurement operations. Based on the well-known Windows standard, its intuitive user interface and predefined, automated processes and command buttons make the job easy. All functions are quickly accessible and displayed only if they are actually needed, ensuring that the screen is always clearly arranged and uncluttered.

Solid physical foundation
WinFTM employs an algorithm based on fundamental parameters in order to determine composition of alloys, as well as thickness and composition of coatings, in one single measurement. Without requiring the use of standards (calibration), the unknown measurands are computed accurately from the signal spectrum.

Calibrating
Quality standards require that measuring equipment can be calibrated based on norms that are traceable to international or national calibration standards, thereby producing results that are traceable and comparable (to other methods). For this reason, each measurement application of the FISCHERSCOPE X-RAY instruments can be calibrated. The WinFTM Software stores and manages all calibration data, making it easy and convenient to document and substantiate the calibration.

Error calculation/Calculation of the measurement uncertainty
The WinFTM software provides complete error computation. The overall uncertainty of a measurement (or of the mean value from several measurements) is computed, taking into account the uncertainty of the standards, the counting statistics of the calibration measurements, and the measurement itself. This measurement uncertainty ensures the required traceability of the measurement result.

Video image
WinFTM shows video of the sample from the same viewing direction as the primary beam. A superimposed scaled crosshairs that automatically adapts to the respective image magnification depicts the position of the measurement spot in real size on the surface of the sample. The autofocus function allows easy, accurate and reproducible optical focusing.

DCM – Distance Controlled Measurement
To measure on geometrically irregular parts or in indentations, FISCHERSCOPE X-RAY instruments are equipped with a special feature for distance-based measurement correction: the DCM Method. This function also allows for testing of complex surface shapes and for measurements in indentations, whereby WinFTM automatically factors the current measuring distance in when computing the measurement result for a specific area.

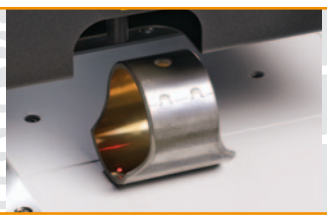
Automated Measurements
Recurring sequences can be easily automated by using predefined commands, which in turn can be activated with a user-defined command button. Even complex test plans with instructions for the operator, e.g. for quality control in manufacturing, can be integrated into a very simple operating procedure.

When using instruments with a programmable XY-stage, measurement spots defined on one sample can be automated for repeatable measuring procedures.

The WinFTM software can recognise specific structures via image processing and track the measurement positions automatically. For specimens with shape tolerances, for example, this can ensure that measurements are always made at the correct location.

COATING THICKNESS

MATERIAL ANALYSIS



Measurement with DCM-method

Automated measurement

Substrate Material Recognition

For certain coating thickness measurements, WinFTM can automatically analyse the substrate material as well. This not only eliminates the need for normalisation when taking measurements on different materials, it also increases the reliability of the results because the coating thickness is correctly measured despite eventual fluctuations in substrate material composition.

Classes of Materials (COM)

Using the COM function, unknown samples can be assigned automatically to a predefined material class. These classes may be different kinds of materials, e.g. different alloys, specific coating thicknesses, or concentration ranges of a coating structure.

For example, this allows for the differentiation of gold alloys with high, medium or low gold content or with specific alloy elements. It should be noted that the spectra necessary for defining the classes are computed theoretically, eliminating the time-consuming calibration of multiple material samples. The system can also be adapted or expanded to meet the particular needs of the customer.

When measuring samples of unknown or diverse material compositions and coating thicknesses, WinFTM can automatically select the appropriate application to use for the measurement.

For example, in gold analysis, WinFTM first determines the type of alloy and then selects the appropriate measuring application required to determine the gold content with high accuracy.

Multiple Excitation

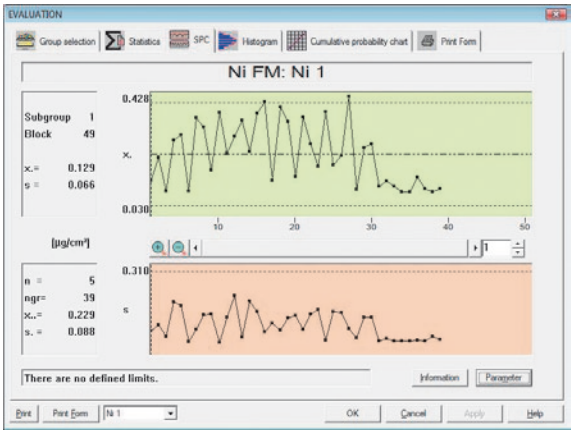
For each application, the excitation parameters "high voltage" and "primary filter" are set to produce the best possible results. For some applications, however, it may be necessary to work with different excitations in order to measure all parameters optimally. The WinFTM software enables the use of multiple excitations within a single measurement, so that all parameters are measured under the best possible conditions; the collected results are then presented in one combined evaluation.

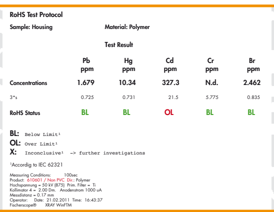
Reliable

Nothing is worse than unwittingly conducting an incorrect measurement! For this reason, WinFTM automatically checks to see if the selected measuring application matches the sample being measured – and warns the operator in case of deviations. Background tests monitor the instrument with respect to its basic parameters and thus ensure the highest degree of reliability.

Statistical Evaluation

From the individual measurement results, integrated statistics functions compute the mean value, the standard deviation and the coefficient of variation and display these values in a statistics window. The measurement results can be displayed individually, in a list, or as an SPC chart – and can also be documented.





RoHS Test Protocol

Sample: Housing **Material: Polymer**

Test Result

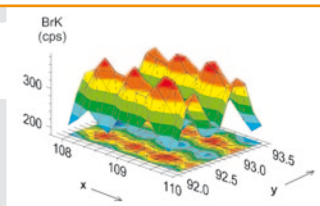
	Pb ppm	Hg ppm	Cd ppm	Cr ppm	Br ppm
Concentrations	1.679	10.34	327.3	N.d.	2.462
3*s	0.725	0.731	21.5	5.775	0.835
RoHS Status	BL	BL	OL	BL	BL

BL: Below Limit[1]
OL: Over Limit[1]
X: Inconclusive[1] -> further investigations

[1]Accordig to IEC 62321

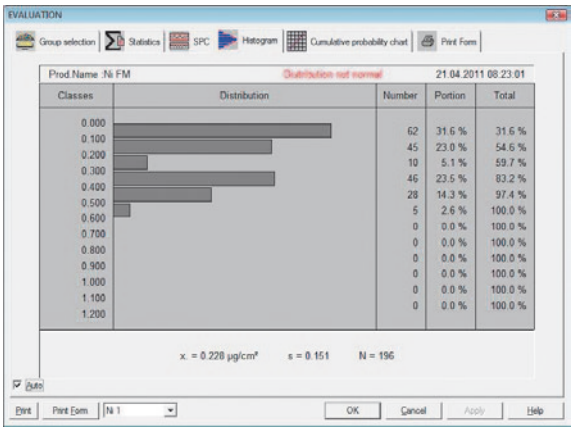
Measuring Conditions: 100sec
Product: 610601 / Non PVC Dir.: Polymer
Hochspannung = 50 kV (875) Prim. Filter = Ti
Kollimator 4 = 2.00 Dm. Anodenstrom 1000 uA
Messdistanz = 0.17 mm
Operator: Date: 21.02.2011 Time: 16:43:37
Fischerscope® XRAY WinFTM

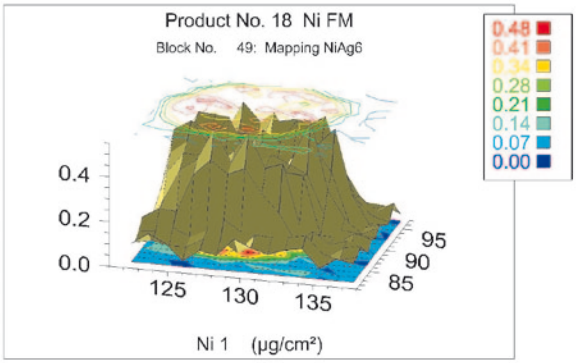
Measurement report



3D display of an element distribution

Furthermore, WinFTM presents the measurements alternatively as a distribution (histogram, probability chart) or in a Statistical Process Chart (SPC). Capability indices C_p and C_{pk} are calculated for the specified tolerances.





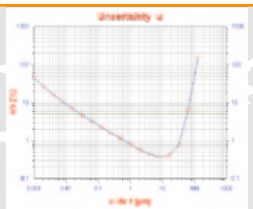
Export Measurement Results and Print Forms
Single readings and block mean values, along with their measurement uncertainties, characteristic statistical values and any additional data relevant to the measurement, can be exported into files and evaluated using, for example, quality management systems. The integrated report generator produces individual result reports and custom print form templates. The content elements of the documentation can be specified freely, e.g. video image of the sample with measurement spots, the measurement results, characteristic statistical values, histogram, probability chart, spectrum, etc.

WinFTM Software Features

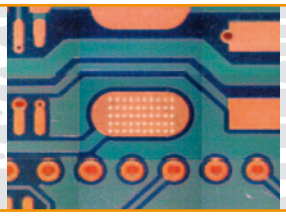
- Universal software
- Coating thickness measurement and analysis
- One single package with all functions
- User-friendly, intuitive operation
- Fundamental parameter method
- Sorting by class of materials
- Automated measurement sequences
- Adjustable measuring parameters (high voltage, filters and apertures)
- Multiple excitation
- Video image – with zoom, crosshairs and autofocus
- Substrate material recognition
- DCM – Distance Controlled Measurement
- Statistics functions
- Data export
- Report generator
- Documentation of calibration and settings
- Multiple interfaces and networking options

COATING THICKNESS

MATERIAL ANALYSIS



Calculation of measurement uncertainty



Programming of measuring points