SPECTRO xSORT

Handheld XRF Spectrometer for

Quick Onsite Elemental Screening and Analysis

手持式X射线荧光光谱仪

应对现场快速元素化学成分分析

Contents
内容

- ## The Instrument 仪器介绍
    - Introduction 概述
    - Highlights 亮点

- ## Technology 技术特点
    - All Important Elements in a Few Seconds
      数秒内的多基体全元素分析
        - Analytical Shutter 多用途分析快门
        - Safety First   安全优先

- ## Hardware and Software 硬件/软件配置
    - Interface for Everything 全功能接口
    - SPECTRO XRF Analyzer SPECTRO XRF Analyzer软件

- ## Applications 应用

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The Instrument - Introduction
仪器介绍 - 概述

SPECTRO xSORT is a compact, ergonomically designed, handheld XRF spectrometer for high throughput elemental testing, screening and analysis of a broad range of materials.

SPECTRO xSORT 光谱仪是根据人体工程学原理设计的集多种不同基体材质材料（金属、有机材质和粉末）的化学组成定性定量分析能力于一身的新一代小型手持式X射线荧光光谱仪，

The second generation offers improved analytical performance in a more compact instrument.

新一代SPECTRO xSORT在减小设备尺寸同时提供更佳分析性能

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Instrument – Highlights
仪器介绍 – 亮点

- High resolution, high sensitivity SDD detector

  较之经典半导体计数器更高分辨率和灵敏度的SDD硅漂移计数器（标准配置）

- All relevant elements from Mg to U

  镁～铀全元素分析

  - Only one measuring cycle is required for fast screening of alloys

  - 快速金属分析PMI仅需一个分析周期2秒分析时间

- Optimized packages for a wide range of applications

  多种应用配置可以灵活搭配选择

- Laboratory-like analytical results within a few seconds

  数秒内得到实验室级的分析结果

- Ultra-fast elemental screening

  快速元素分析

Technology: Practical, Compact and Robust
技术特点：结构紧凑，可靠性好，实用性高

The SPECTRO xSORT is a compact instrument. Rechargeable battery and computer are integrated into the robust housing.

SPECTRO xSORT采用紧凑型设计，可充电电池以及工业级计算机采用一体化设计。

Together with its application packages for alloy analyses, it is prepared for the requirements of onsite PMI, sorting and grade identification.

金属应用集现场合金材料鉴别（PMI），材料分类和牌号鉴别等多种功能于一身

2 seconds are long enough for the analysis of typical alloys; 10 additional seconds are required if elements like Mg, Al, Si, S or P are of interest.

2秒显示牌号和实验室级的分析结果，额外增加10秒可分析Mg，Al，Si，P，S等非金属（轻）元素

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All Important Elements in a Few Seconds
数秒内的多基体全元素分析

Compliance screening or the elemental screening of contaminated soil and sediment can be done within seconds.

数秒内可以根据合规检测元素分析要求或对污染土壤以及沉积物的有关元素成分完成分析

In mining applications, the ores as well as the concentrates and the tailings can be characterized. While in the field, the analyzed data can be correlated to the current analysis position using the optional, integrated GPS module.

可以针对原矿，精矿以及尾矿等不同要求进行品味分析，集成GPS可将测试点地理位置坐标同测试数据（图像/化学组成）共同保存

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All Important Elements in a Few Seconds
数秒内的多基体全元素分析

With the SPECTRO xSORT it is possible to generate laboratory-like results for all relevant elements from Mg to U in a cycle that lasts just a few seconds. Only 30 seconds are necessary for a complete compliance screening.

SPECTRO xSORT 可以在数秒的分析时间对包含土壤，岩石，沉积物，有机材料（胶质/木材），陶土，矿物粉末以及金属在内的各种材料中的Mg~U范围内的有关元素进行实验室级的现场无损分析，完成全元素分析也只需30秒

The optional video system enables visualization of the spot of analysis. The image can be stored together with the measurement data for documentation purposes.

可选CCD视频系统可以精确定位测试区域，测试区域的视频图像可以和测试数据（GPS坐标/化学组成）共同保存

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Technology：Analytical Shutter
技术特点：多用途分析快门

The SPECTRO xSORT has a shutter that securely closes the measuring aperture and protects the technology behind it from dirt and damage.

SPECTRO xSORT的快门可以安全的屏蔽X射线电磁辐射并保护光室内部的光学器件免于灰尘污染和碰撞损伤。

Its function, however, includes much more: It is also the sample for ICAL – control measurements that the instrument independently conducts as required. Deviations are immediately recognized and corrected for.

Thus, all of the calibrations available on the instrument are always ready for use.

The result?
SPECTRO xSORT's excellent precision.

此外，快门还被作为ICAL校准样品用以执行全自动校准，当监测到设备飘移时将自动智能执行ICAL自校准**程序，**

借此保障设备始终处于最佳测试状态。

由于采用这一独特的漂移校准技术，使得xSORT具有同类产品中最佳的分析精度

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Technology: Safety First
技术特点：安全优先

- A film on top of the measure window   the
  detector   during measurer
  保护窗膜防止测试样品损坏检测器

  Shutter / X-rays On

- Special adapter available for smaller
  samples not completely covering the
  measuring window
  小样品测试架保证体积小于测试窗的小样品的测试安全

- Docking station for small, thin samples,   for compliance
  testing and environmental
  samples analyses
  测试吊舱用于塑胶等材质的合规检测或环境类样品的高精度全元素分析

- Radiation safety gasket to shield the operator from radiation scattered by the sample
  防散射保护罩屏蔽使操作人员免于样品散射的辐射伤害

- Two safety modules guarantee that an unintentional measurement cannot be started
  双重安全模式保证误操作无法激发X射线

- LEDs on the side and on top of the instrument clearly indicate an activated X-ray tube and the
  execution of a measurement
  位于仪器侧面和顶部LED指示灯清晰的指示仪器工作状态（ready/激发/测量）

- Automatic recognition of insufficient coverage of the measure window with immediate termination
  of the measurement and closing of an opened shutter
  具备Interlock安全互锁和硬体快门。如未检测到测试样品，快门互锁装置会于200毫秒内自动关闭
  快门并同时切断X射线

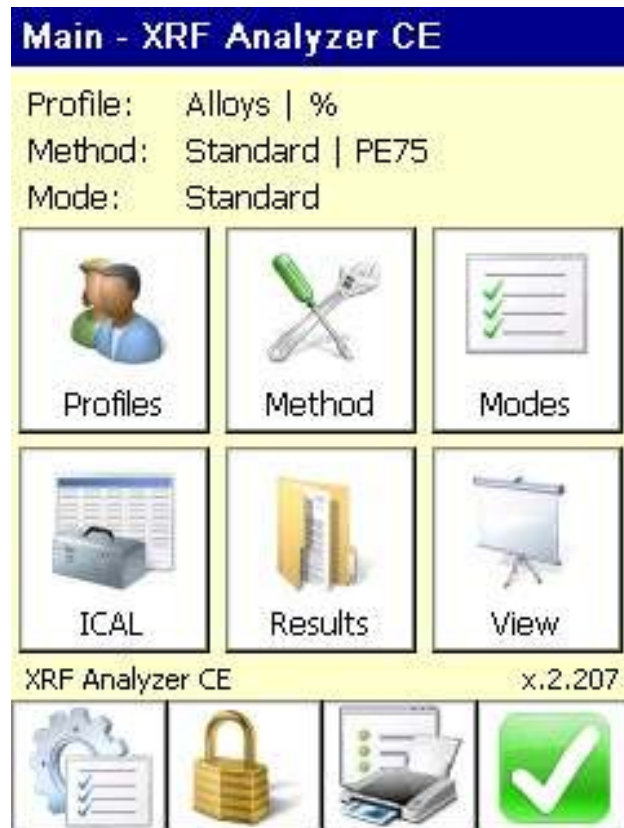# Hardware and Software: SPECTRO XRF Analyzer
硬件/软件配置：SPECTRO XRF Analyzer软件

The SPECTRO XRF Analyzer instrument software based on Windows Mobile offers a simple interface for operation of the SPECTRO xSORT in spite of numerous configuration possibilities.

基于Windows Mobile操作系统的SPECTRO XRF Analyzer软件操作简单，功能强大

Hardware and Software: SPECTRO XRF Analyzer
硬件/软件配置：SPECTRO XRF Analyzer软件

The Analysis screen supplies the operator with all of the necessary information at a single glance and can display the measurement results in different views.

可根据操作人员习惯调整的多种显示模式使得样品分析结果和相关信息一目了然

Hardware and Software: SPECTRO XRF Analyzer
硬件/软件配置：SPECTRO XRF Analyzer软件

A quick sorting mode is available in addition to the analysis mode; where all test pieces are compared to the first sample measured.

分析模式以外还可以选择快速分选模式用于快速判定样品是否合规

The analytical results are stored and can be later displayed, printed and, after transfer to an external computer, processed with the "Result Manager" software delivered with the instrument.

分析结果可以被存储，随后可以显示、打印或者上传到外部PC利用随机附赠的"Result manager"软件处理

Hardware and Software: SPECTRO XRF Analyzer
硬件/软件配置：SPECTRO XRF Analyzer软件

Display of analytical results including statistical error.

统计误差可以同分析
结果同时显示

Alternative display of compliance statement according to predefined threshold values.

根据设定的合规检测
标准值判定材料合规
与否

Applications
应用

Typical alloy applications for the
SPECTRO xSORT analyzer include:

SPECTRO xSORT包含的典型金属应用包括：

- Positive Material Identification (PMI)
  合金材料鉴别

- Metal identification and analysis in metal recycling
  废旧金属回收

- Precise analysis of stainless steel in the manufacturing process
  不锈钢、镍基高温合金生产制造中的QA/QC精确分析

- Measurement of small parts (<5 mm) e.g., screws and pins
  小样品（尺寸小于5mm）分析，如螺丝以及引脚

- Identification of precious metal alloys
  贵金属分析

- PGM applications (Platinum Group Metals)
  铂族金属应用（催化剂等）

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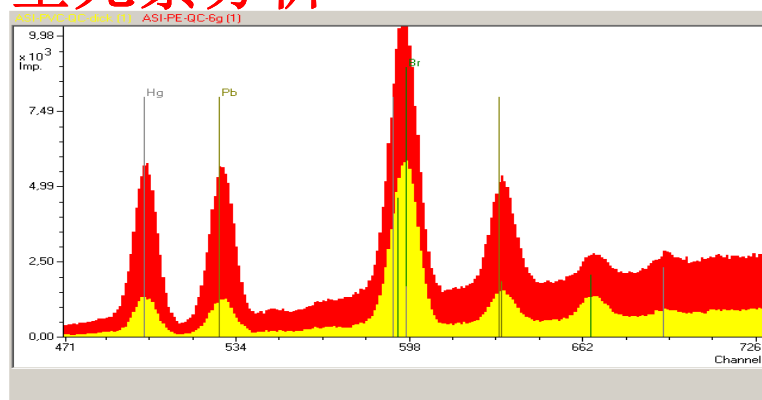# Analysis of Soil, Sewage Sludge and Waste
土壤，污泥淤渣和废弃物垃圾分析

难点：

- Matrix influences have to be considered when analyzing soil, sewage sludge or waste.

  复杂基体多基体材料分析

- A large number of important elements have to be monitored: Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Br, Ag, Cd, Sn, Sb, Hg, Tl, Pb, …

  全元素分析，如： Cr, Mn, Fe, Co, Ni, Cu, Zn, As, Se, Br, Ag, Cd, Sn, Sb, Hg, Tl, Pb, …

- Accuracy can be limited by sample taking and sample preparation as well as spectral effects caused by sample thickness and other characteristics.

  分析精度依赖于取样和样品前处理，样品的形状和厚度也会对分析结果造成影响

Compliance Screening
全元素分析

The right matrix correction is important for every XRF analysis.

基体校正对于XRF分析非常重要

Not only the accuracy, but also the detection limits, strongly depend on the matrix.

分析精度和检出下限很大程度上都依赖于基体材质

Spectra of PE and PVC samples each with 500 mg/kg Pb.
PVC和PE材质中500ppm的铅光谱图

The SPECTRO xSORT automatically considers the scattering of the fluorescence signals caused by differences in sample matrix, sample thickness as well as absorption and secondary excitation within the sample for the element to be determined.
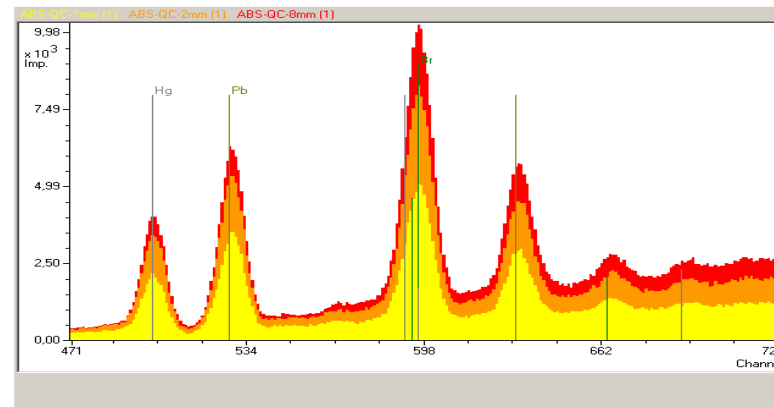
SPECTRO xSORT 自动处理由于基体差异，样品形状/厚度，以及样品中各元素吸收和增强效应造成的荧光散射信号。

Spectra of ABS samples 1, 2 and 9 mm in thickness each with 500 mg/kg Pb
500ppm铅元素在不同厚度的ABS塑料中光谱图

Analysis of Ores, Concentrates and Tailings
矿石分析

- Differing matrices have to be considered using rather complex corrections
  必须考虑不同基体差异所引起的复杂的基体效应。

- Important elements: Cr, Mn, Fe, Ni, Cu, Zn, W, Pb and others
  关注元素： Cr, Mn, Fe, Ni, Cu, Zn, W, Pb and others。

- Analysis onsite or during ore dressing
  现场或加工过程中品味控制

- Mapping of large areas with handheld XRF to detect ore deposits
  大面积矿区地质调查

- The SPECTRO xSORT has an optional fully integrated GPS system to automatically localize and document the analysis position
  SPECTRO xSORT 具有集成GPS

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SPECTRO xSORT

Thank You

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