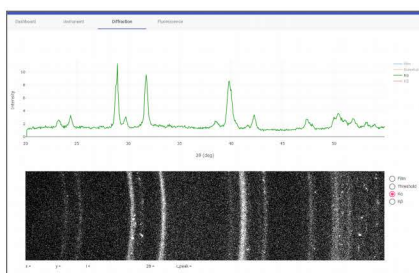


portable XRD/XRF for Cultural Heritage



Duetto-2 is a portable instrument for non-invasive in-situ X-ray diffraction (XRD) and X-ray fluorescence (XRF) analysis. Its predecessor Duetto, launched in 2010, was the first commercial XRD/XRF instrument designed specifically for Cultural Heritage. Based on the same general principles, **Duetto-2** benefits from a decade of improvement in system and component design.

Duetto-2 can be used in the laboratory or deployed in the field (museum, archaeological site, restoration project, etc) using a variety of mounting options.



The technology at the base of Duetto derives from NASA planetary instrument development programs, and brings unprecedented miniaturization and ruggedness to Cultural Heritage Research.

KEY FEATURES

MINIATURIZATION

At just under 35 cm and 6 kg for a complete instrument, Duetto-2 is the smallest XRD instrument ... in the Solar System! This is enabled by technology developed for NASA Space exploration.

X-RAY SOURCE

A novel miniature ceramic/metal construction X-ray tube developed for Space missions is used in conjunction with an internal HVPS and proprietary control electronics.

X-RAY DETECTOR

The new deep-cooling sealed vacuum X-ray CCD detector improves speed and energy resolution while reducing power.

FASTER ANALYSIS

The geometry is optimized to double the speed of Duetto-1.

SAMPLE IMAGING

Embedded color camera, LED illumination and micro-focused laser allow real-time imaging of the sample and precise positioning of the instrument.

IMPROVED VERSATILITY

Increased clearance to the sample and a variety of optional mounts broaden the application range.

INTUITIVE SOFTWARE

New software offers advanced controls and data processing with an intuitive, dynamic and user-friendly graphic interface.

LOW POWER

Requiring only 40W of power and low voltage, Duetto-2 can operate all day using the optional battery power station.

Duetto-2 specifications

X-ray sensor	photon-counting deep-depleted CCD, 1024 x 256, 26 μm pixel, -45 °C (Peltier), forced air cooling.
X-ray tube	ceramic-metal construction, grounded cathode, 25 kV nominal (adjustable), 10 W max (adjustable), forced air cooling. Target material: Co (Cu upon request).
X-ray filter	K β filter default (removable).
XRD range and resolution	20 to 55 °2 θ , 0.2 to 0.3 °2 θ FWHM ⁽¹⁾
XRF range and resolution	3 to 20 keV, <200 eV FWHM at Mn K α
Sample viewing and positioning	Laser, embedded color camera and LED lighting. ⁽²⁾
Typical analysis time	10 to 60 min ⁽³⁾
Ambient Temperature	0 to 30 °C
Power input	45 W, 12-24 Vdc from AC adapter or optional Li batteries.
Size and mass	38 (l) x 30 (w) x 14 (h) cm, 5.9 kg
Control PC	high-performance 15" laptop (provided), USB connection to instrument, Linux and Windows available.
Control software	proprietary software with GUI for control, data viewing and automated preliminary interpretation.
Data interpretation software	PC-based 3 rd party software options offered. eXaminart's web-app QAnalyze.com available at no cost.
File format export	txt, csv, xy, plv, mdi, ...and any ASCII format requested.
Mounting	photographic quick release to customer supplied support, optional precision alignment head, tripod, benchtop mount, scaffolding mount, ...
Transportation	ground and air shipping in rugged transport case provided, checked airline luggage compatible.

(1) varies with 2 θ . Practical FWHM varies depending on sample nature, grain size, surface roughness, etc.

(2) Duetto-2 is auto-focus and focus-tracking ready.

(3) most simple compositions can be identified in a few minutes. Data is shown in real time, acquisitions can be stopped when sufficient S/N is observed.

Designed and manufactured in California.



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