

Handheld XRF

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# DELTA Series

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## DELTA PROFESSIONAL Handheld XRF for Positive Material Identification (PMI)



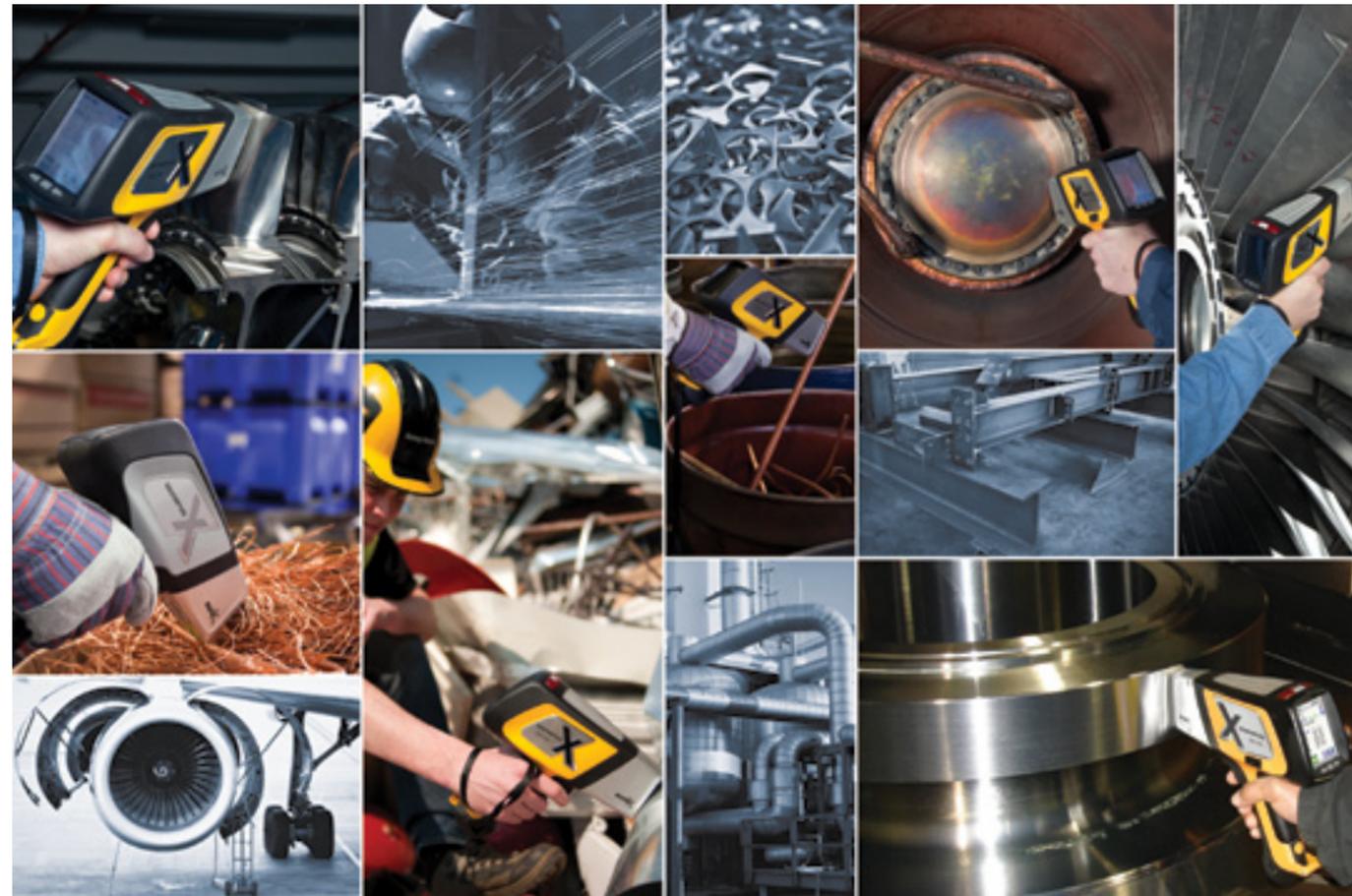
Fast, Nondestructive Inspections for  
QA/QC, Safety and Maintenance

# DELTA Handheld XRF Analyzer for Alloy and Metal Identification

Configured with a standard package of more than 25 elements, the DELTA generates alloy chemistry and grade ID in seconds. From simple sorting to challenging grade

- Aluminum alloys
- Chrome-moly steels
- Cobalt alloys
- Copper alloys
- Exotic alloys
- Magnesium alloys
- Nickel alloys
- Nickel-cobalt alloys
- Precious metals
- Stainless steels
- Tool steels
- Titanium alloys
- Wrought aluminum alloys
- Zinc alloys
- Zirconium alloys

## The DELTA Knows Metal and Alloys



When you need a reliable analysis tool to provide fast and accurate Positive Material Identification, turn to the DELTA. From turnings, shavings, rods, and wires to small parts and

components, to more sizeable material or structures, the DELTA provides anywhere, anytime testing with faster and more accurate results than ever before.

## Exclusive DELTA PMI Features

The DELTA is a reliable and rugged analyzer that maximizes both speed and accuracy. The need to determine whether an ID is incorrect or if longer testing is required needs to be balanced with maximum testing speed without increasing the risk of mistaken IDs or erroneous readings.

Olympus' SmartSort solution automates all these decisions, enabling even inexperienced operators to maximize both speed and inspection accuracy. This powerful feature yields optimized throughput and accuracy, making the DELTA an extremely productive XRF tool for alloy inspection.

### High-Temperature Ready

- The DELTA is engineered to be utilized for in-service inspection of high temp systems with temperatures in excess of 426 °C (800 °F)
- Industry-exclusive heat sink dissipates heat away from the XRF electronics
- Can be used for longer durations in hot environments
- Facilitates enhanced reliability of key XRF electronic components
- Provides faster cooling of electronics after exposure to high temperatures

### Grade Match Messaging

- Enables qualitative information and messages to be added into the grade ID library
- Fully customizable messages allow for refinery-specific coding messages
- Can be used to store multiple Messaging libraries for individual work sites

### Tramp Library

- A long-time standard feature in OES systems, the DELTA is the first Handheld XRF to incorporate this feature
- Allows operators to set a max tolerated concentration for individual elements in 7 unique grade families; these elements are considered "tramp" or "residual" elements
- The DELTA comes preloaded with a tramp library based on industry standards
- The analyzer can identify and report tramp material, enabling the user to simplify grade matching by not having to count small, expected amounts of tramp elements against the grade match
- Detects and quantifies tramp residuals critical to selective corrosion investigations and failure analysis



The powerful DELTA Handheld XRF maximizes both speed and accuracy for alloy and metal ID, quality control and assurance, safety and maintenance.

### SmartSort Mode

- Enables specific grades to be set up to automatically extend testing time, thus preventing mix-ups
- Maximizes efficiency for speed testing. Automatically extends tests for light elements (Mg, Al, Si, P, S) when absolutely necessary, thus eliminating unnecessarily long tests, and preventing mix-ups
- Makes the DELTA an extremely fast and accurate inspection tool

El	%	+/-	Spec (Ti 3 2-5)
Al	3.0		Nom. [2.00-4.00]
Ti	94.25	0.52	[95.88-98.97]
V	2.67	0.16	[2.06-3.09]
Fe	0.09	0.02	Tramp

Analysis results display demonstrating Nominal value (3% Al) and Tramp element (0.09 % Fe) features.

# DELTA for Positive Material Identification

## With Newly Available X-act Count Technology

### Superior Light Element Analysis

Traditionally a difficult area for handheld XRF, the analysis of light alloys and elements (Mg, Al, Si, P, S) can now be routine with the DELTA Alloy and Metal XRF Silicon Drift Detector (SDD) Analyzer with the newly available X-act Count Technology. Its integration with a 40kV Rh-anode tube and automatic filtering provides fast, precise

### DELTA SDD Analyzer Benefits

- Magnesium (Mg) detection down to 0.20%
- Quick and accurate quantification of S content in stainless and low alloy steels
  - Reliable identification of 303 and 416 grades
- Measures Si and Al in stainless, bronzes and other alloys
- Measures P in carbon steel down to 0.014% with exclusive 3-beam Alloy Plus calibration
- Extensive grade library combined with SmartSort provides nominal chemistry for light elements when the fastest testing speeds are required



### Ultimate Aluminum Analysis

The new Olympus DELTA SDD Analyzer offers unmatched Al performance. It easily and directly sorts and grades Aluminum and Aluminum-containing materials.

#### Aluminum Alloys

- Accurately measures Mg content in 5000 series alloys and separates Mg-containing alloys. Sorts 3003 and 3004; 1100 and 6063; 2014 and 2024

#### Titanium Alloys

- Accurately determines the Al content in Ti alloys, including CP Ti cut with Al

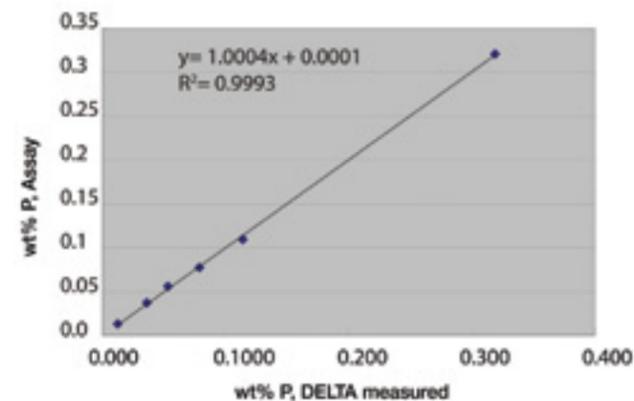
#### Red Metals

- Accurately classifies Al and Si bronzes

#### High-Temperature Cast Stainless

- Measures Al in high-temp, Ni/Co superalloys

analysis of transition and heavy metals, and sensitive measurement of light element content. SmartSort maximizes testing throughput – sample by sample, testing is automatically extended or terminated – maximizing accuracy and throughput.



Correlation plot of Phosphorus (P) in Low Alloy Steel Analysis by DELTA Premium SDD Analyzer.



El	%	±%	Spec.(355)
Mg	0.38	0.13	[0.20-0.45]
Al	92.31	0.19	[89.75-93.30]
Si	6.90	0.04	[6.50-7.50]
Mn	0.021	0.006	[0.00-0.35]
Fe	0.17	0.01	[0.00-0.60]
Ni	0.027	0.003	Tramp[0.05]
Cu	0.055	0.004	[0.00-0.25]
Zn	0.076	0.004	[0.00-0.35]
Pb	0.019	0.002	Tramp[0.05]
Bi	0.034	0.002	Tramp[0.05]

DELTA alloy results screen

## DELTA Handheld XRF for Overall Value

### Small Component and Weld Analysis

#### Integrated Small-Spot Collimator

DELTA Analyzers have a standard 9 mm spot size, but can be equipped with a 3 mm diameter spot collimator for highly focused sample analysis. This provides the capability of analyzing thin weld beads independent from substrate materials and small fixture components, wires, and solders.

- Spot sizes can be changed by simply touching the screen.
- An integrated full VGA camera takes a live video image of the sample tested and superimposes a spot location for precise test location.
- The sample image is saved to memory after analysis. The image can be archived along with the analysis results and exported for simple report generation.

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Bi	0.034	0.002	Tramp[0.05]

### Easy Report Generation

- Get fast, easy-to-interpret customizable results screen
- Export data to wireless printer via Bluetooth®
- Generate custom reports with DELTA PC Software
  - Incorporate quantitative and qualitative results
  - Incorporate analysis images
  - Incorporate operator & company information
  - Incorporate company logo



### Welding Grade Library

- Can be activated alongside the standard inspection library for comprehensive PMI work
- Provides easy grade addition or editing onboard the analyzer
- Standard Grade Match Messaging library included



DELTA with a optional welding mask

PMI Analysis				Test Information	
Test Result				Analyzer Mode: Alloy	
Test ID: 11/16/10 #0				Analyzer Serial #: 510312	
Alloy				Field	
Grade Match Result: 317 - Exact Match				Info	
El	%	±%	317		
Cr	18.65	0.17	[18.00-20.00]		
Mn	1.45	0.08	[0.90-2.00]		
Fe	63.77	0.35	[57.76-69.50]		
Ni	12.66	0.18	[11.00-15.00]		
Cu	0.30	0.05	[0.00-0.75]		
Mo	2.13	0.03	[2.00-4.00]		
Spectrum					
Signature: _____ Date: _____					

DELTA Alloy Report Generation

# The DELTA Series

## Everything You Need in Handheld XRF with State-of-the-Art Innovation

The New Generation DELTA Handheld XRF Analyzers are ergonomically advanced with a forward looking design incorporating the latest in electronics, components, and software technology.



### DELTA Professional

The DELTA Professional with a 40kV tube and SDD detector is the best value solution from Olympus for handheld XRF analyzers. It provides superior performance in speed, LODs, and elemental range.



### DELTA Premium

The DELTA Premium with advanced 40kV tube and large area SDD detector is best for ultra quick, analytically demanding applications, such as trace levels and light elements in low alloy steel, soil, mining, and metallurgical samples.

### DELTA Classic Plus

The DELTA Classic Plus with a 40kV tube and Si-PIN detector is ideal for simple applications. It provides quick ID, screening, sorting, and elemental and metals analysis.

Some DELTA Professional and Premium models can be configured with a 50kV tube to optimize LODs for high-Z and challenging elements, such as Ag, Cd, Sn, Ba, Cr, Sb, Te, and Rare Earth Elements (REEs).

The newly available DELTA X-act Count Technology can provide even better sensitivity and precision in faster time for more materials than before. Throughput is increased with the same or better precision in half the time for most elements.

### Features and Benefits

Powerful 4W X-ray tube, 200  $\mu$ A current (max), optimized beam settings

Tight geometry for exceptional LODs and high analysis throughput

Large-Area SDD and customized X-ray tube options for exceptional sensitivity and precision for more elements and materials

Patent-pending automatic barometric pressure correction that adjusts calibration as needed for more accurate analysis of light element.

Lightning-fast data acquisition for faster testing time

Floating Point Processor: Provides more calculations in less time, and leverages more advanced calibration algorithms

Integrated Bluetooth® for data input and output available in most countries

Integrated wide area heat sinks throughout the DELTA body for high power use in extreme temperatures

Analysis indicator lights visible from 360° to help ensure safe use

Advanced colortouch LCD screen for clarity, brightness, responsiveness, and energy efficiency for indoor/outdoor use

Accelerometer technology puts the unit into sleep mode to save energy when not in use; logs impacts for tool management

DELTA PC Software for enhanced data analysis, calibration modeling, and optional closed beam workstation operation

USB interface port for high-speed downloads and seamless PC control

Ergonomic rubberized handle for enhanced grip

Docking Station and Hot Swap Batteries



The unique DELTA Docking Station frees you from having to power down the analyzer. The station charges the analyzer battery and a spare, and performs periodic calibration checks. DELTAs can be operated 24/7 in the field with hot swap battery replacement.

## Optional DELTA Accessories



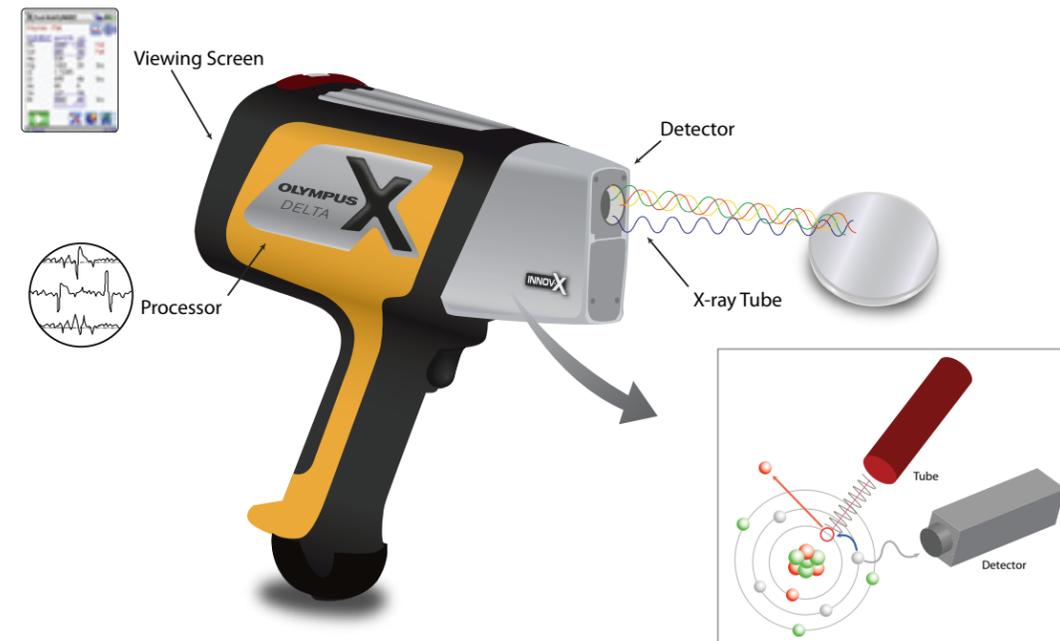
### 1. DELTA Portable Workstation

Portable workstation with integrated safety-lock shielding is convenient for small objects; a PC is connected for remote control of this closed-beam DELTA set-up.

### 2. DELTA Holster

The holster keeps the DELTA by your side and within easy reach.

## DELTA Handheld XRF Configuration



The DELTA brings the power and flexibility of handheld X-ray fluorescence spectrometry to the field. Ruggedized and ultra portable, this dramatically fast 24/7 technology provides accelerated testing times, allowing for hundreds more tests to be conducted per day with analytical confidence. The DELTA series analyzers are configured with powerful

miniature X-ray tubes, Si-PIN detectors or highly advanced Silicon Drift Detectors (SDD), specialized filters, and multi-beam optimization for the ultimate in XRF field analysis. The DELTA's real overall value is to help make decisions in real time with minimal reliance on off-site laboratory testing.

## The DELTA Line

The DELTA series handheld XRF analyzers are configured with powerful miniature X-ray tubes, Si-PIN, or highly advanced Silicon Drift Detector (SDD) detection, specialized filters, and multi-beam optimization for the ultimate in XRF field analysis.

### DELTA Specifications\*

	DELTA Premium	DELTA Professional	DELTA Classic Plus
<b>Excitation Source</b>	4W Rh, Au, or Ta anode (per application) X-ray tube	4W Ag, Rh, Au, or Ta anode (per application) X-ray tube	4W Au or Ta anode X-ray tube
<b>Detector</b>	Silicon Drift Detector	Silicon Drift Detector	Si-PIN Diode Detector
<b>Analytical Range</b>	Alloy and Mining: Mg and up for Rh/Ag and Al and up for Ta/Au; Soil: P and higher		Alloy and Mining: Ti and higher; Soil: P and higher
<b>Weight</b>	1.5 kg (3.25 lbs) without battery		
<b>Dimensions</b>	260 × 240 × 90 mm (10.25 × 9.5 × 3.5 in.)		
<b>Environmental Temp Range</b>	-10 °C to 50 °C (14 °F to 122 °F)		
<b>Processing Electronics</b>	530 MHz CPU with integrated FPU with 128 MB RAM; Proprietary Olympus Digital Pulse Processor (DPP)		
<b>Smart Electronics</b>	Accelerometer; Barometer for atmosphere pressure corrections of light elements' measurements		
<b>Power</b>	Rechargeable Li-ion battery; Hot-swap maintains analyzer power during battery charge		
<b>Data Display</b>	32 bit Color QVGA resolution, Blanview transmissive backlit touchscreen; 57 × 73 mm (2.25 × 2.9 in.)		
<b>Data Storage</b>	1 GB microSD (stores ~75,000 readings)		
<b>Data Transfer</b>	USB, Bluetooth®		

### Standard Accessories

- Waterproof Carrying Case
- Two (2) Li-ion Batteries
- Electronic User Manual and User Interface Guide and Printed Quick Start Guide
- Docking Station
- Mini USB Cable
- 316 Stainless Steel Calibration Check Reference Coin
- Ten (10) Spare Windows
- Integrated Wrist Strap
- DELTA PC Software
- Factory Authorized Training and Support

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