

**Jewelry and
Precious Metal
Analysis**



**Thermo Scientific
Portable XRF Analyzers**



*Complete assay of precious metals
from refining to recycling*



Thermo Scientific Portable XRF Analyzers

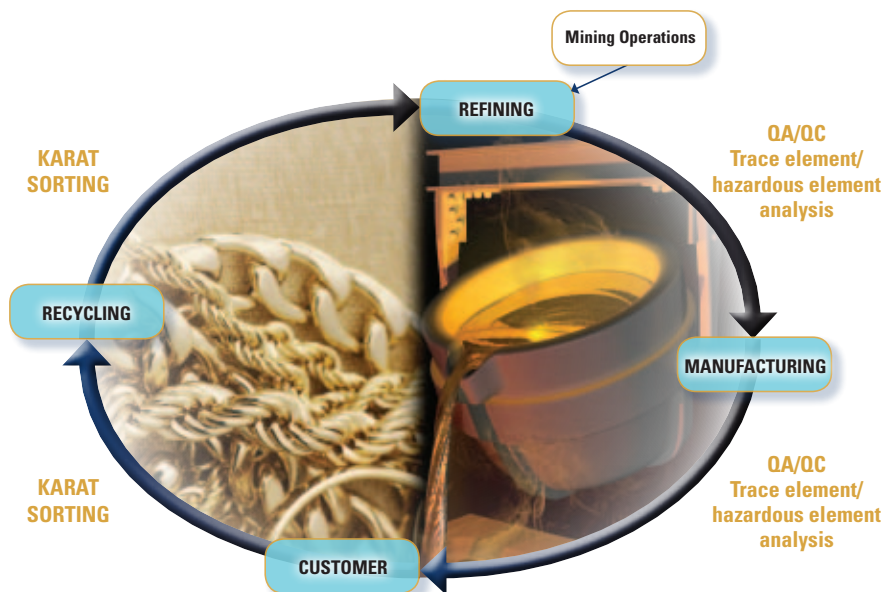
Accurate precious metal analysis

Throughout the precious metal life cycle – from refining to recycling – the goal is to ensure quality, control costs, and achieve accurate purity analysis. With the volatility and high price of precious metals, even a small variation in composition accuracy can be expensive.

Thermo Scientific portable x-ray fluorescence (XRF) analyzers deliver fast, reliable results – and unlike more traditional testing methods are completely nondestructive. From the elegant design and superior performance of the Thermo Scientific Niton DXL desktop x-ray lab to our handheld Niton® XL2 Series analyzers, these instruments provide you with the ideal method to test the purity and chemistry of all precious metals, with unmatched simplicity, performance, features, and portability. What's more, our proprietary Thermo Scientific Au/gold Detection & Identification Technology (AuDIT™) helps you meet the challenge of identifying those gold-plated items that can adversely affect the profitability of your business.

Take your Thermo Scientific portable analyzer anywhere. It's your personal field laboratory for dependable elemental analysis that delivers a real competitive edge.

Refining through Recycling

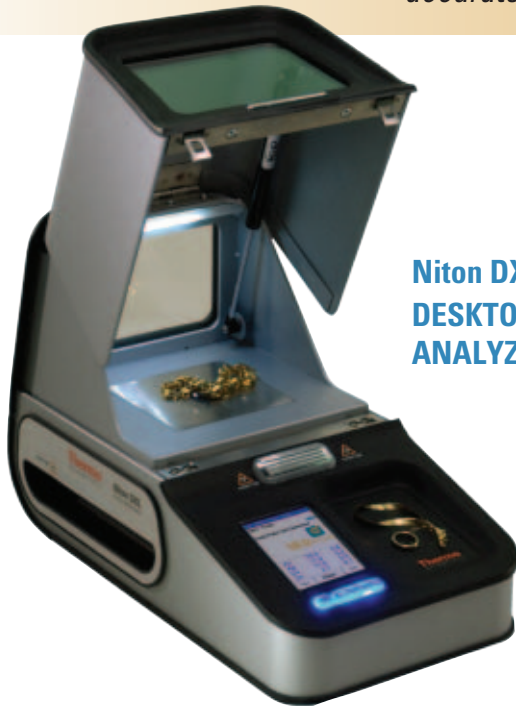


XRF ANALYSIS THROUGHOUT THE LIFE CYCLE

FAST, EASY, MOBILE

Instant Results...Lab-Quality Analysis

Thermo Scientific portable XRF analyzers deliver fast performance and accurate analysis with the single push of a button or pull of a trigger.



**Niton DXL
DESKTOP
ANALYZER**



**Niton XL3t
GOLDD+
ANALYZER**



**Niton XL2
PRECIOUS METAL
ANALYZER**

▶ **Exceptionally fast, easy to use**

Just close the lid and push a button, or point and shoot (Niton XL2). See results in seconds on a bright, color, touch-screen display.

▶ **Fit, form, function**

Engineered from the ground up, keeping ergonomics and the retail environment in mind, Thermo Scientific precious metal XRF analyzers ship from the factory fully calibrated and ready to use upon arrival at your site. Minimal training is required and our built-in system check helps ensure your analyzer will continue to run as well as it did the day it arrived.

▶ **Accurate gold-plate detection**

With patent-pending AuDIT technology, there's an easy way for gold-buying operations to detect gold plating with the simple press of a button or pull of a trigger.

▶ **Nondestructive**

Unlike destructive testing methods such as acid and fire assay, samples remain intact and undamaged.

▶ **Lab-quality performance**

Thermo Scientific portable XRF analyzers make use of the most advanced electronics and detectors available today. All of our instruments use either silicon PIN (Si-PIN) or silicon drift detectors (SDD), which are also found in large and expensive laboratory equipment.

Powerful Precious Metal Analysis

High performance in an easy, one-step process

Weigh the Benefits

Just a few seconds – that’s all it takes to determine the exact precious metal content in jewelry, coins, and other valuable products using either the Niton DXL desktop x-ray lab or our handheld Niton XL2 analyzer.

- Faster, more comprehensive than fire assay, with comparable accuracy (See Figure 1)
- Easier, quicker, more accurate than other on-site testing methods such as nitric acid scratch tests
- Simultaneous analysis of all precious metals as well as common alloying elements – including gold (Au), silver (Ag), platinum (Pt), and palladium (Pd)
- Fast, simple, and accurate karat sorting
- AuDIT plating detection technology immediately identifies the presence of gold-plated material
- Rapid, single-step process. Results in less than 5 seconds
- Minimal training required

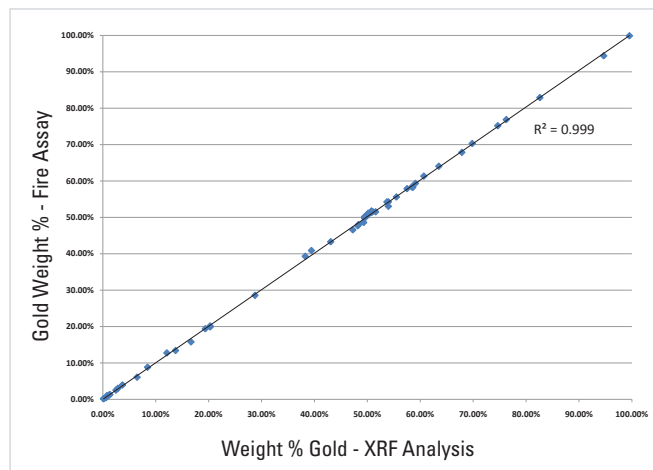


Figure 1. Gold content analysis – Thermo Scientific precious metal XRF analyzers vs. fire assay

PMRS Knows Its Worth

Looking for a fast, accurate, and easy-to-use solution to help with its precious metals reclamation, Precious Metals Reclaiming Service (PMRS), Westwood, Massachusetts and Lantana, Florida, chose Thermo Scientific Niton XRF analyzers to meet the challenge. Allan Nyborn, president, comments, “We’ve been doing this for more than 60 years, and since we’ve gotten our [Thermo Scientific] Niton analyzers, I don’t know how we could run our business without them now. They’re rugged, reliable, and dependable.”





Niton DXL Precious Metal Analyzer – Designed for the Countertop

Whether you are a retail jeweler, pawn shop, jewelry manufacturer, or otherwise engaged in the business of buying and recycling scrap jewelry, the Niton DXL precious metal analyzer offers you superior performance in a compact footprint. (See Figure 2.)

- Elegant, industrial design – fits seamlessly with the décor of a retail environment
- Front and rear windows for viewing an LED illuminated sample chamber – ensures that items undergoing analysis never leave the customer’s sight
- Shielded sample chamber – closed-beam XRF system prevents x-ray exposure to customers and operators
- Fast, one-touch operation – quick, smooth, efficient transactions
- Integrated CCD camera – permits easy sample positioning and image recording
- Optional 3 mm small-spot focus – allows isolation and testing of small components
- Battery or AC power operation – easily moved within the shop, yet portable and rugged for use in remote testing locations

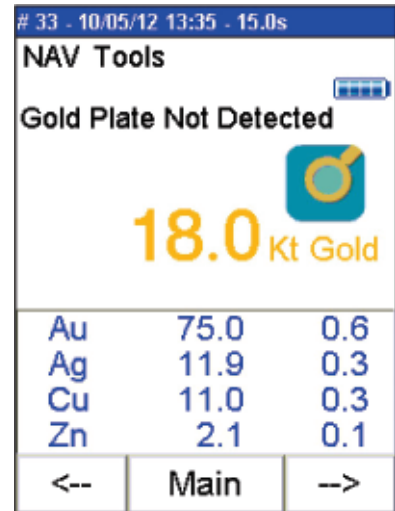


Figure 2. Example of 18k gold analysis using the Niton DXL x-ray lab

Niton XL2 Precious Metal Analyzer – The Ultimate in Portability

Using the Niton XL2 precious metal XRF analyzer, you get accurate purity analysis in a specially packaged, affordable solution. These handheld instruments offer you an easy method for testing the chemistry of all precious metals, providing you with outstanding performance and portability.



GCAL Makes a Brilliant Choice

Since the beginning of the “gold rush,” Gem Certification & Assurance Lab, Inc. (GCAL™), which is headquartered in the World Diamond Tower in New York City, and its president, Don Palmieri, have appeared as experts for most of the major TV networks on gold stories investigating and uncovering predatory buying practices aimed at consumers. In all such reports, Palmieri has said, “We rely on Thermo Scientific Niton XRF instruments for accurate analysis of jewelry being tested.” He adds, “What’s more, in addition to precious metals testing, using the XRF analyzer, we also can detect lead in glass-filled gemstones, and detect cubic zirconia quickly in parcels of melee or even pave diamond-set jewelry.”

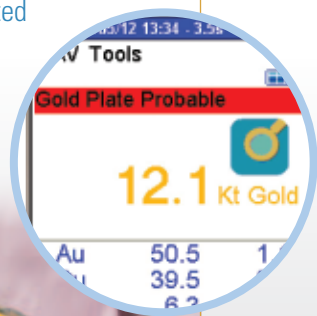


QUALITY COMING IN AND QUALITY GOING OUT.

What's Under Your Plate – AuDIT Technology

For buyers of scrap gold jewelry, gold-plated pieces present a significant challenge. With AuDIT, our patent-pending software feature, there is an easy, efficient way for gold-buying operations to detect gold plating with the simple push of a button or pull of a trigger.

AuDIT itself is a proprietary plating detection technology developed for, and only available on, Thermo Scientific portable XRF analyzers, including the Niton DXL and Niton XL2 precious metal analyzers. Several independent, complementary methods in the software work in tandem to alert users to the probability that an item is plated. Based on elemental XRF signatures, the primary technology performs regardless of the gold concentration of the plated surface layer. It works for vermeil (gold-plated silver), as well as gold-plated copper, steel, tungsten, and any other non-gold substrate.



The Niton XL3t GOLDD+ Analyzer

If an application requires higher sensitivity and low limits of detection (LOD) for trace element analysis, we offer the Niton XL3t analyzer with geometrically optimized large area drift detector (GOLDD™) technology – the Niton XL3t GOLDD+. This is the ideal instrument for quality control as well as screening raw materials for elements that could poison refining batches. Using these high-performance analyzers, you can ensure the chemistry and purity of material before and after the refining process.

The Bullion Room Finds Priceless Solution

The Bullion Room, Birmingham, England, specializes in buying and refining scrap precious metal from trade sources. Now, in addition to the Niton XL3t analyzer purchased in August 2008, the company also owns the latest handheld analyzer, the Niton XL2 GOLDD for light element detection (Mg-S). Eamon Gaughan, managing director comments, "We use [Thermo Scientific] Niton x-ray 'guns' at every point in our internal processes, from checking bought gold at our Trade Counter to estimating the purity of bars after melting and prior to assay. As the amount of metal we buy over our counter has increased by huge volumes in a very short space of time, speed and accuracy of analysis have become essential and the [Thermo Scientific] Niton x-ray guns have helped us greatly."



ELIMINATING THE GUESSWORK

Screen Jewelry for Toxic Substances

Before your precious metal jewelry or other valuable products reach store shelves or consumers' hands, you want to ensure that they are free of any toxic substances. Our Thermo Scientific portable XRF analyzers are the first choice in determining the presence of low concentrations of dangerous heavy elements such as lead (Pb) and cadmium (Cd).

In fact, Jeff Weidenhamer, Ph.D., Professor of Chemistry and Chair, Department of Chemistry, Geology & Physics at Ashland University, Ashland, Ohio says, "The Niton XL3t XRF analyzer has proven to be a valuable screening tool to determine the lead and cadmium content of jewelry."

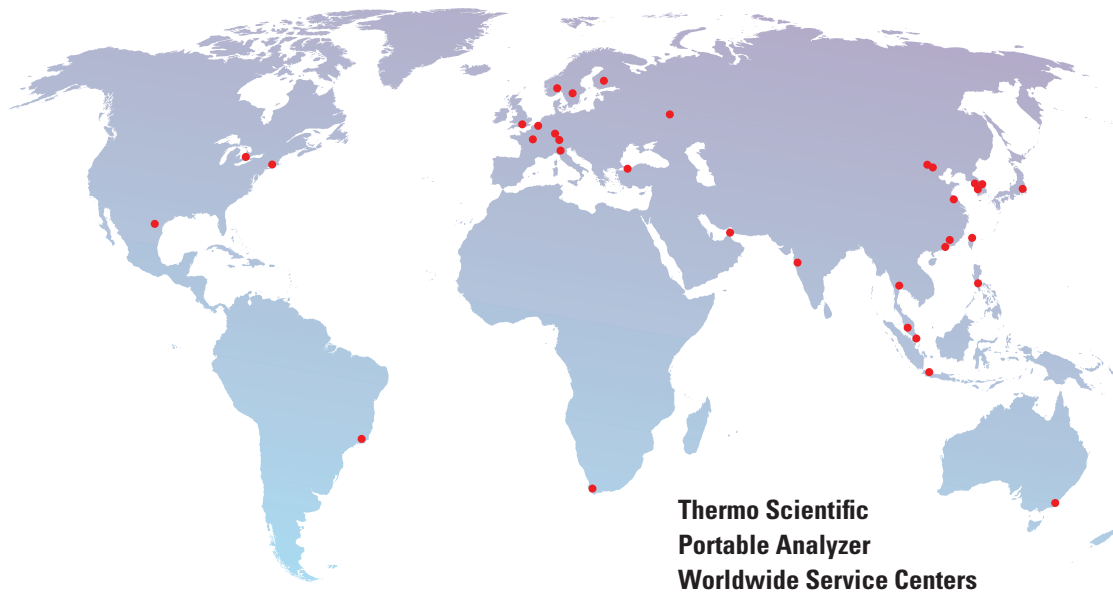
Through Thick and Thin

What's more, you can also measure coating thickness for known plated materials to maintain quality control of your process. Help eliminate costly errors of over-coating and under-coating for optimum coating thickness.



American Jewelry and Loan Sorts It Out

Since its inception, American Jewelry and Loan, the largest pawn shop in Detroit, Michigan, USA, has tested the purity of the gold it takes in by using the "acid test" method. When Seth Gold, managing partner with father Les, heard about an instrument that could tell them within three seconds the purity of the gold being analyzed, he investigated and was convinced. Now that they have the Thermo Scientific Niton XL2 precious metal analyzer, Seth notes, "It's a lot easier. It's faster. It's better than acid. The cost of the analyzer is a small price to pay to ensure that the items we take in are 100 percent accurate."



**Thermo Scientific
Portable Analyzer
Worldwide Service Centers**

Superior XRF analysis solutions, backed by our worldwide sales and service

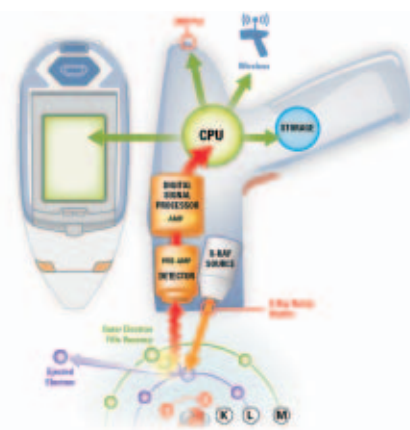
We are recognized as the leader in XRF analysis technology, serving companies in more than 75 countries on six continents. We serve our customers through corporate resources and a dedicated network of more than 70 distributors and 30 factory-trained service centers around the world to provide the most effective customer service possible. Our global reach and resources not only ensure worry-free product support, we also offer comprehensive services including application consulting and training anywhere you need them.



How XRF works

X-rays have a unique ability to ionize or “excite” elements present in materials. When ionized elements return to a relaxed or stable state, they emit fluorescent x-rays whose energy levels are “signatures” of specific elements emitting these x-rays.

Thermo Scientific portable XRF analyzers harness this phenomenon by (1) sending ionizing x-rays into a sample, (2) measuring the energy levels of the returning fluorescent x-rays (the elements’ “signatures”), and (3) counting these x-rays to determine the relative concentration of each individual element present. Through complex, iterative calculations, the onboard computer provides a complete elemental analysis of the sample and displays it to the user. All of this is done in mere seconds, with accurate results typically provided in less than 5 seconds. The analysis results are stored locally on the analyzer in a tamperproof format, which can be downloaded to computers for further analysis and reporting either in our NDT™ software or other third-party programs such as Microsoft Excel®.



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