

**Jewelry and
Precious Metal
Analysis**



**Thermo Scientific
Niton XRF Analyzers**



*Complete assay of precious metals
from refining to recycling*



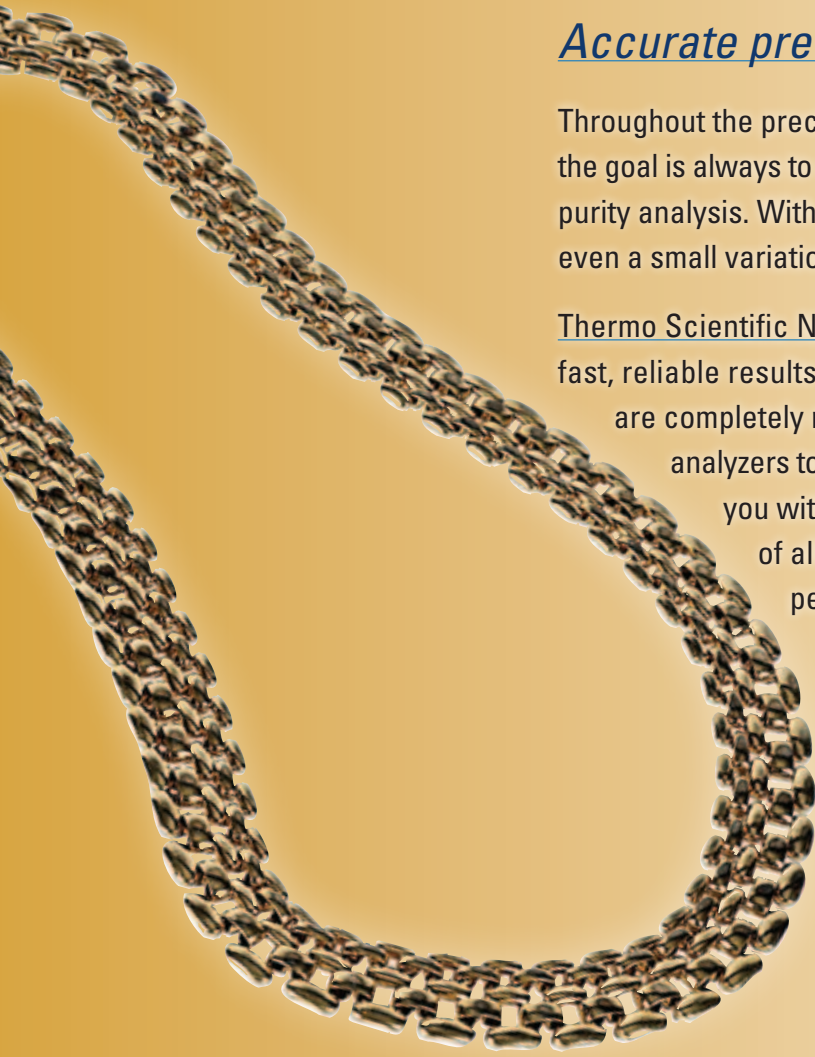
Thermo Scientific Niton XRF Analyzers

Accurate precious metal analysis

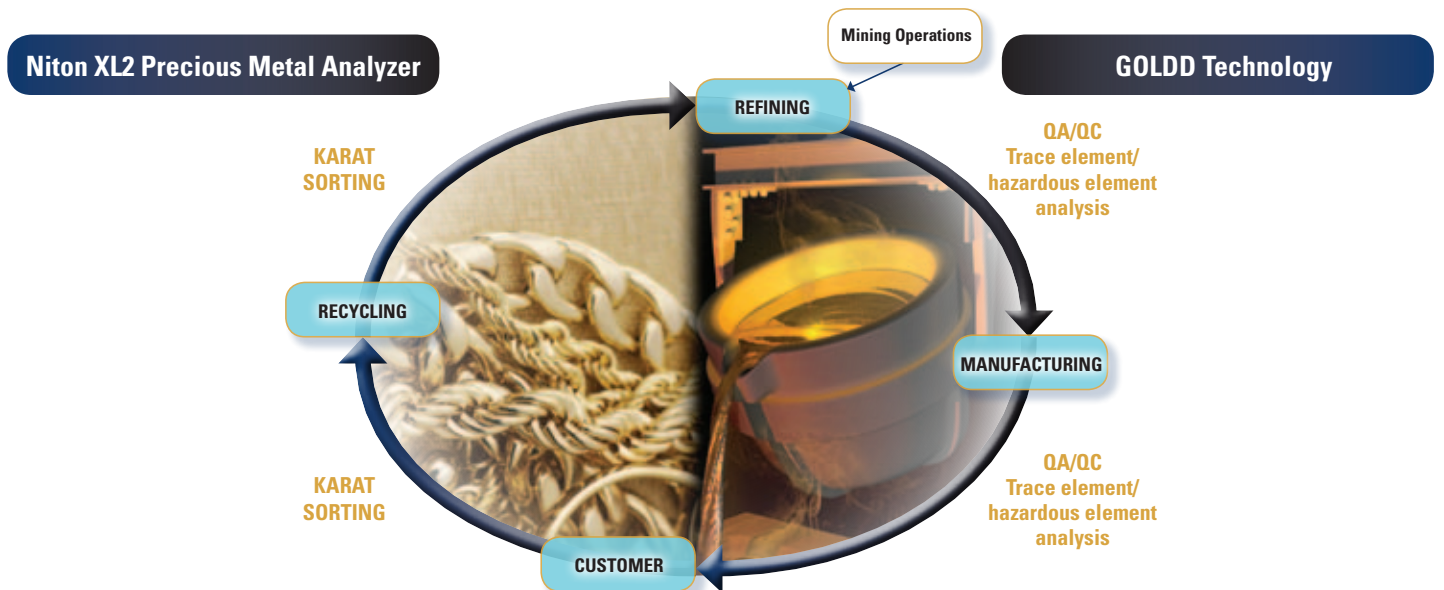
Throughout the precious metal life cycle – from refining to recycling – the goal is always to ensure quality, control costs, and achieve accurate purity analysis. With the volatility and high price of precious metals, even a small variation in composition accuracy can be expensive.

Thermo Scientific Niton x-ray fluorescence (XRF) analyzers deliver fast, reliable results – and unlike more traditional testing methods, are completely nondestructive. From our award-winning handheld analyzers to our field-mobile x-ray lab, these analyzers provide you with the ideal method to test the purity and chemistry of all precious metals, with unmatched simplicity, performance, features, and portability. You also get an accurate chemical analysis of other tramp and trace elements, which could impact valuation and future refining needs.

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



**Niton XL3t
GOLDD+**
SUPERIOR
HANDHELD
PERFORMANCE
AND FEATURES



**Niton XL2
GOLDD**
HANDHELD
PERFORMANCE
LEADER

**Niton XL2
PRECIOUS METAL
ANALYZER**
HANDHELD
VALUE LEADER



**Niton FXL
FIELD X-RAY LAB**
ULTIMATE IN
PERFORMANCE
AND FEATURES



▶ Exceptionally fast, easy to use

Just point and shoot or close the lid (Niton FXL or handheld with test stand). See results in seconds on a touch-screen color display.

▶ Fit, form, function

Engineered from the ground up, keeping ergonomics and ease-of-use in mind, Thermo Scientific Niton 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 continues to run as well as it did the day it arrived.

▶ Nondestructive

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

▶ Lab-quality performance

Thermo Scientific Niton 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. More common proportional counter detectors are not used since they do not provide the resolution, accuracy, and speed demanded by our customers.

Powerful Precious Metal Analysis

High performance in a value package

Weigh the Difference

Just a few seconds – that's all it takes to measure the exact precious metal content in jewelry, coins, and other valuable products using the Niton XL2 precious metal analyzer. (See Figures 1 and 2.)

- Faster, more comprehensive than fire assay, with comparable accuracy
- Easier, faster, more accurate than nitric acid test methods

You get all the power of our top-of-the-line instruments in a specially value-packaged solution.

- Simultaneous analysis of all precious metals – including gold (Au), silver (Ag), platinum (Pt), and palladium (Pd), as well as many other common alloying elements
- Fast, simple, and accurate valuation and karat sorting
- Rapid, single-step process. Results in less than 5 seconds
- Minimal training required
- Completely nondestructive without the need to use acid or other harsh chemicals

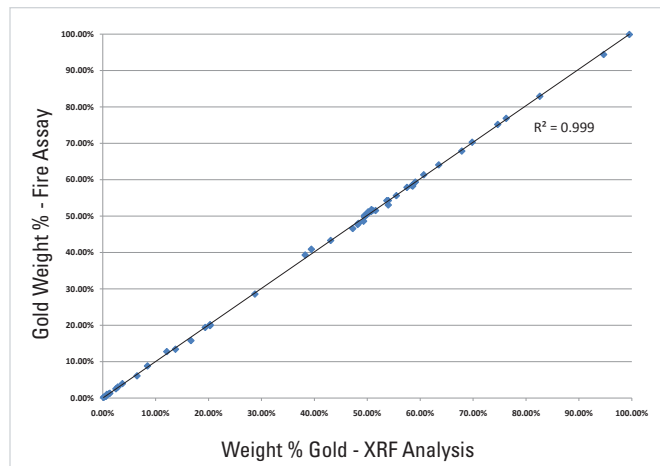


Figure 1. Gold content analysis – Thermo Scientific Niton XRF analyzer vs. fire assay



Figure 2. Example of 18k gold analysis



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."



GCAL Makes a Brilliant Choice

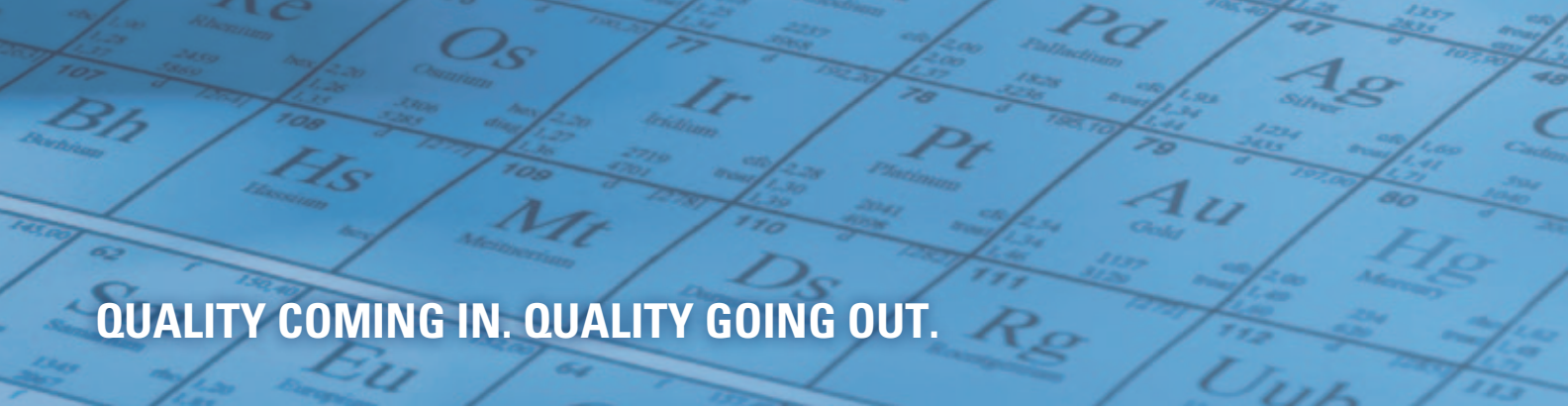
Since the beginning of the "gold rush," Gem Certification & Assurance Lab, Inc. (GCAL™), which is headquartered in the World Diamond Tower in New York City, and its president, Don Palmieri, have appeared as experts for most of the major TV networks on gold stories investigating and uncovering predatory 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."



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."





QUALITY COMING IN. QUALITY GOING OUT.

If your application requires an expanded element suite and low limits of detection (LOD) for trace element analysis, we offer a choice of powerful instruments to meet your specific needs. Either handheld Thermo Scientific Niton analyzers with geometrically optimized large area drift detector (GOLDD) technology, the Niton XL2 GOLDD and Niton XL3t GOLDD+, or the Niton FXL field x-ray lab are ideal 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.



GOLDD Technology

Thermo Scientific geometrically optimized large area drift detector (GOLDD) technology provides rapid measurement times and exceptional detection limits for trace elements and toxic metals.

Thermo Scientific GOLDD Analyzers

Handheld	Field X-ray Lab
Superior sorting speed and chemistry in a simple-to-use handheld analyzer	Ultimate in performance and features, beyond that of a handheld while maintaining our trademark ease of use
Integrated CCD camera and optional small-spot improve test positioning on complex samples (Niton XL3t GOLDD+ only)	Motorized X-Y positioning for targeting features down to 1 mm in size
Rapid results for trace and tramp element analysis	Bridges the gap between handhelds and lengthy, costly, and sometimes destructive lab-based analysis
Accurate results in seconds – from power on to trigger pull	Transportable, battery-operated analyzer with large display and enclosed sample chamber



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 Niton XL3t GOLDD+ analyzers and Niton FXL instruments 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.



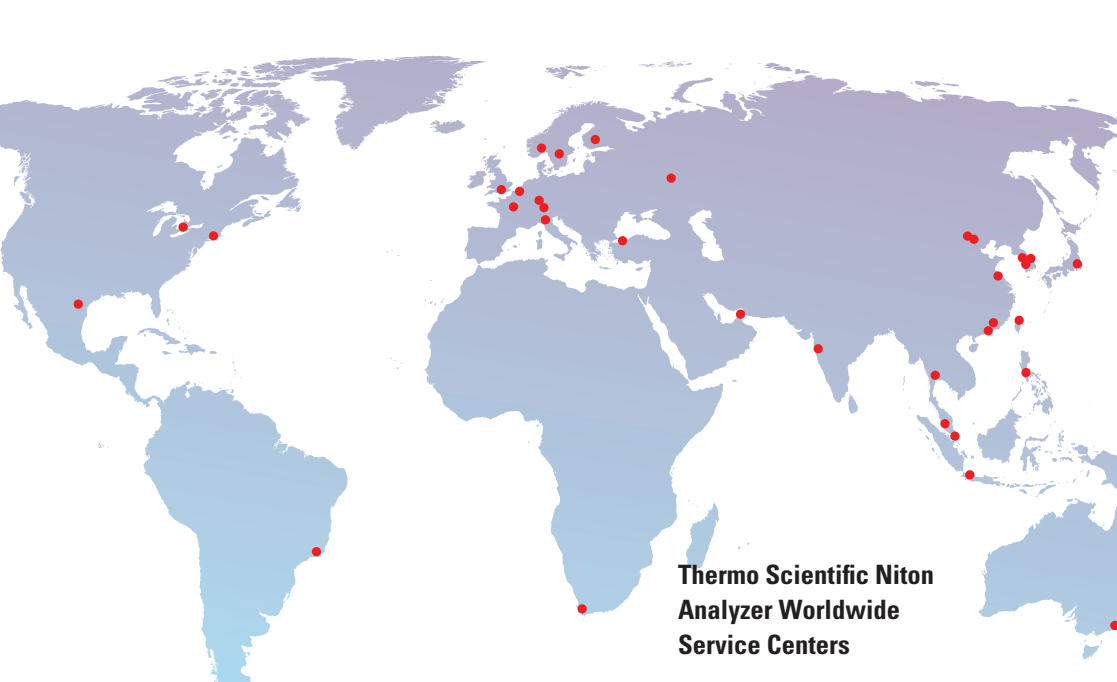
Accessories

Portable test stand – collapsible for easy transport and provides a fully-shielded platform for analysis of small or irregularly shaped samples, plus bagged and cupped samples. Onboard RFID technology automatically adjusts the analyzer's parameters for test stand use.



Accessories – Among our "wireless" accessories are a battery-powered thermal printer and a barcode scanner, both of which connect via Bluetooth™ to your instrument. The printer provides you with a strip-chart printout of results after each reading. The barcode scanner, which comes complete with a rechargeable battery and charger, projects a field for rapid entry of barcode information into analysis data fields.





**Thermo Scientific Niton
Analyzer Worldwide
Service Centers**

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

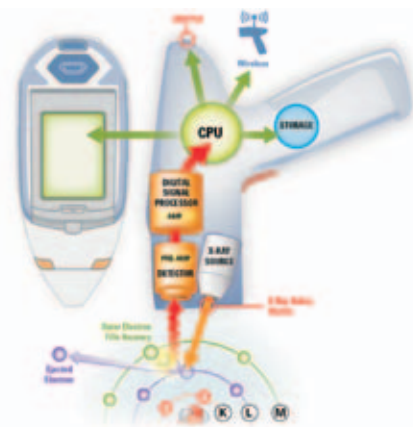
We are recognized as the leader in XRF analysis technology, serving companies in more than 75 countries on six continents. We serve our customers through corporate resources and a dedicated network of more than 70 distributors and 30 factory-trained service centers around the world to provide the most 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 Niton 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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