

X-MET8000

Measurement of gold jewelry with the X-MET8000 series

BACKGROUND

Gold prices have increased significantly over the last five years. Buying and selling jewelry is big business due to the fluctuations of precious metal prices. For gold (Au) traders, accurate analysis of material can make a large difference on their profit margin. For example, 1 kg (2.2 lbs) of gold jewelry with 14 karat (kt) instead of 18 kt, can make a price difference of around \$10,000 USD.

However, the real issue is if 1 KG of jewelry is bought as 18 Karat and but later found to be 16 Karat which is much more difficult to identify through other methods, the difference could be around \$7,000 of lost revenue.

With Hitachi's X-MET8000 you can easily and accurately verify the quality of the Au-alloys within seconds. Its simple to use with minimal operator training and provides instant results which can be displayed or shared via our app.

ANALYTICAL SOLUTION

Traditional methods to determine the karats of gold alloys are slow, need acids and can cause chemical burns on human skin. Additionally, only a limited range of karats can be tested, and the accuracy of the result depends a lot on the user experience.

Analysis with a modern handheld analyser has several advantages:

- It doesn't require any chemicals
- It doesn't damage or destroy the analysed jewelry
- It's fast, analysis time can as be short as 5 seconds
- It is accurate to ~ 0.1 or 0.2 kt on average for longer measurement times

The field portable X-MET8000 XRF analyzer combines a high-performance X-ray tube and state of the art silicon drift detector delivering the speed and performance needed for the routine analysis of precious metals in jewelry.

The analyzer comes with a complete solution with a factory-installed precious metals calibration so the unit can be used straight out-of-the-box.



SAMPLE PREPARATION

No special sample preparation is necessary. The light stand or benchtop stand should be used for smaller pieces or irregular shapes.

For small pieces, the small spot method can be used. This can also be used to measure specific parts on a piece of jewelry.

RESULTS

A set of certified reference materials (CRM) were used to determine the performance of the X-MET8000 analyzer. The samples were yellow, pink, and white gold which contained mainly Au, Ag, Zn, Cu, Ni and Pd. This example data shown in this report was taken with 10 s measurement time. If only an identification of the alloy is needed, the measurement time can be reduced to 5 seconds.

Certificate	Measured	Difference
8.89 kt	8.91 kt	-0.02
12 kt	12.03 kt	-0.03
13.89 kt	13.88 kt	0.01
18 kt	17.98 kt	0.01
22 kt	22.05 kt	-0.05
23.04 kt	23.03 kt	0.01
24 kt	24 kt	0.00
14.05 kt	13.88 kt	0.17
18.02 kt	17.96 kt	0.07

You can also increase the measurement time to 60 s and get an even higher accuracy analysis.

CONCLUSION

The X-MET8000 can easily save money as the commercial value of gold jewelry can be identified accurately within seconds allowing you to buy at its real value rather than the suggested value. There's no need to buy consumables, unlike acid testing.


The X-MET8000 can do much more than just determining the karats, including determining the content of precious metals with a high accuracy and it can also determine any unwanted hazardous elements in jewelry. The analyzer comes with all required accessories, the pre-installed factory calibration and full operator training.

You can start your analysis right after unboxing the X-MET8000.

An investment in the X-MET8000 could see a return on your money in a very short period of time.

Contact us for a demo or further information.

Visit www.hitachi-hightech.com/hha for more information.



The image shows the Hitachi X-MET8000 handheld analyzer, which is orange and black. Next to it are two accessories: a small orange cone-shaped collimator and a black metal stand with a safety shield.


ORDERING INFORMATION

- | X-MET8000 Smart, Optimum or Expert
- | Precious FP calibration

Recommended accessories for this application:

- | Integrated camera
- | Small spot collimator (to measure small pieces).
- | Light stand and safety shield or Benchtop stand (to ease measuring small items and to stop scattering from the sample).

Precious ↑ 5s. 18:04



Collimator ON

Precious ↑ 5s. 18:08

17.8 K

GOOD MATCH (1/3)

ELEMENT	%	+/-	LIMIT
Au	74.19	0.197	73.97 - 74.38
Ag	25.81	0.143	

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