

ARUN TECHNOLOGY APPLICATION NOTE

PRECIOUS METALS AND JEWELLERY

Precious metals are not only used in jewellery, but have applications in the electronics industry, for currency (coins), and in medicines, amongst others. All of these industries have a high demand for accurate quantitative analysis of the composition of these metals – additional alloying elements may affect corrosion resistance or ductility, and affect the value considerably.


Traditionally the jewellery industry has relied on visual inspection, magnets, and even acid testing to determine the authenticity and value of gold, silver, and other precious jewellery items. These methods can be inaccurate, damage the jewellery being tested, or even pose health risks to the people performing the tests. X-Ray Fluorescence (XRF) spectroscopy offers a safe, reliable, and non-destructive method that delivers precise compositional analysis within seconds.




WHY CHOOSE AURUM XRF FOR JEWELLERY TESTING?

- Non-destructive testing
- Ease of use, minimal training required
- Versatile data management
- Fast, accurate, reliable results
- Test anytime, anywhere
- Low maintenance costs

24K PURE GOLD

Data		ATL14001 - 15.0 s		
Export	Au999 23.9K	Avg back	Ele	% ±
Spec			Au	99.999 0
Delet			Ti	<LOD <LOD
			Cr	<LOD <LOD
			Mn	<LOD <LOD
			Fe	<LOD <LOD
			Co	<LOD <LOD
			Ni	<LOD <LOD
			Cu	<LOD <LOD

18K ROSE GOLD

Data		20230924050819 - 10.0 s		
Export	Au762 18.2K	Avg back	Ele	% ±
Spec			Au	76.263 0.026
Dele			Cu	11.789 0.03
			Ni	7.054 0.006
			Zn	3.293 0.015
			Ag	1.031 0.005
			Ir	0.57 0.002
			Ti	<LOD <LOD
			LE	<LOD <LOD

Gold jewellery analysis with the AURUM benchtop XRF can detect the karat value within 5 seconds, and more detailed composition within 15 seconds.



Test results for repeatability and accuracy demonstrate the reliability of the AURUM XRF's bespoke precious metal calibration.

Test	Au	Ag	Pd
1	71.16	8.58	1.91
2	71.23	8.57	1.87
3	71.04	8.58	1.92
4	71.09	8.58	1.84
5	71.09	8.56	1.92
6	71.17	8.56	1.90
7	71.17	8.65	1.93
8	71.09	8.64	1.88
9	71.05	8.59	1.93
10	71.17	8.54	1.87
Average	71.13	8.59	1.90
Standard Value	70.83	8.64	2.05