Thermo Scientific Niton XL2 GOLDD Alloy Analyzers

Elemental Limits of Detection in Aluminum/Copper/Iron/Titanium-based Alloys

The Niton® XL2 GOLDD Series x-ray fluorescence (XRF) analyzer is purpose-built for your most demanding applications. Where low detection limits and high sample throughput are critical, our perfect combination of hardware, software, and direct industry experience are combined to provide you with a solution to your most difficult analytical requirements. The chart below details the sensitivity, or limits of detection (LODs)[1] of the Niton XL2 GOLDD Series in wt. % for various elements in aluminum (Al), titanium (Ti), iron (Fe), and copper (Cu) base metals. LODs are calculated as three standard deviations (99.7% confidence interval) for each element for a 120-second total analysis time.

Limits of detection (LODs) are dependent on the following factors:

- Testing time
- Interferences/matrix
- Level of statistical confidence

Please Note:

Ongoing research and advancements in our Niton XL2 Series analyzers with geometrically optimized large area drift detector (GOLDD) technology will lead to continual improvement in many of the values detailed in this chart. Contact a Thermo Fisher Scientific office or your local representative for the latest performance specifications.

Actual analysis time is based on your requirements, and, in most cases, shorter times will give you the detection limits you require. For example, if analysis time was reduced from 60 seconds/filter to 15 seconds/filter, then the detection limits obtained would be approximately twice the values shown in the chart. Similarly, increasing the analysis time will reduce the detection limits by the square root of the increased time.

A/S = Application-specific
N/A = Not applicable

1. *Definition and Procedure for the Determination of the Method of Detection Limit,* 40 CFR, Part 136, Appendix B. Revision 1.11. U.S. Environmental Protection Agency. U.S. Government Printing Office: Washington, DC, 1995.

Limits of Detection in ppm (mg/kg)

	Time	60s per filter			
	Matrix	Al-based Alloys	Ti-based Alloys	Fe-based Alloys	Cu-based Alloys
Elements	Sb	30	100	150	175
	Sn	30	60	90	120
	Pd	20	25	30	35
	Ru	20	50	70	100
	Mo	N/A	A/S	A/S	A/S
	Nb	N/A	200	240	320
	Zr	N/A	50	70	100
	Bi	20	35	50	65
	Pb	20	20	75	50
	Se	N/A	20	20	25
	W	50	150	200	220
	Zn	30	40	60	300
	Cu	30	75	110	N/A
	Ni	50	150	220	110
	Co	50	120	750	50
	Fe	75	300	N/A	75
	Mn	100	250	220	75
	Cr	200	500	110	100
	V	500	1300	150	150
	Ti	1000	N/A	250	275
	S	N/A	N/A	100	N/A
	P	N/A	N/A	200	200
	Si	700	750	425	425
	Al	N/A	4000	3000	3000
	Mg	7500	N/A	N/A	N/A

Element list show is not exhaustive. For limits of detection for elements not shown, please contact a Thermo Fisher Scientific office or your local representative.

In addition to the offices listed below, Thermo Scientific Niton Anaylzers maintains a network of sales and service organizations throughout the world.

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