Thermo Scientific Niton XL3t GOLDD Series XRF Analyzers for Consumer Goods

Elemental Limits of Detection for Consumer Goods Screening

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The Thermo Scientific™ Niton™ XL3t GOLDD™ Series x-ray fluorescence (XRF) consumer goods analyzer provides users with a set of features engineered to improve productivity and profitability. The charts below details the sensitivity, or LODs[1], of the Niton XL3t GOLDD consumer goods analyzer using TestAll™ analysis for typical polymer and metal matrices found in various types of consumer goods.

TestAll Analysis Limits of Detection in ppm (mg/kg)
8 mm Spot Size

	Time	30s per filter						
	Matrix	PE	PVC	Al	Fe	Cu	Zn	Sn
Elements	Ba	110	100	40	120	160	160	1400
	Sb	20	25	15	50	65	70	350
	Cd	10	15	10	25	30	30	220
	Pb	5	15	12	30	80	80	140
	Br	3	8	5	20	25	50	50
	Se	3	20	15	55	90	600	110
	As	3	15	N/A	N/A	N/A	N/A	N/A
	Hg	5	25	25	105	110	300	175
	Cr	10	20	40	175	50	75	120
	Cl	40	N/A	N/A	N/A	N/A	N/A	N/A

LODs using TestAll analysis with 8 mm spot engaged. All results expressed as ppm, using 30s per filter, with all three filters engaged, where applicable.

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

TestAll Analysis Limits of Detection in ppm (mg/kg)
3 mm Spot Size

	Time	30s per filter						
	Matrix	PE	PVC	Al	Fe	Cu	Zn	Sn
Elements	Ba	400	400	90	300	350	400	3000
	Sb	65	75	40	110	130	135	600
	Cd	30	35	20	50	65	70	500
	Pb	10	35	30	125	200	250	300
	Br	5	20	10	45	55	100	110
	Se	10	55	25	115	150	1500	250
	As	10	45	N/A	N/A	N/A	N/A	N/A
	Hg	15	70	65	250	225	700	450
	Cr	15	45	85	200	70	105	250
	Cl	80	N/A	N/A	N/A	N/A	N/A	N/A

LODs using TestAll analysis with 3 mm spot engaged. All results expressed as ppm, using 30s per filter, with all three filters engaged, where applicable.

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

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

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

LODs are calculated as three standard deviations (99.7% confidence interval) for each element, using 30-second analysis times per filter.

Please Note:
Ongoing research and advancements in our Niton XL3t GOLDD Series consumer goods analyzers 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 30 seconds/filter to 15 seconds/filter, then the detection limits obtained would be about 1.5 times (i.e., the square root of 2). Similarly, increasing the analysis time from 30s to 120s will reduce the detection limits by 2.

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.

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