Low limits, high standards

Elemental limits of detection

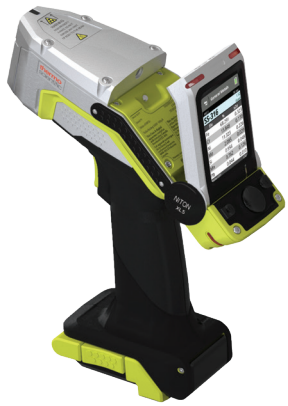
The Thermo Scientific™ Niton™ XL5 handheld XRF analyzer is built for your most demanding applications. Where low detection limits and high sample throughput are critical, the Niton XL5's combination of hardware and software provide you with solutions to meet your most difficult analytical requirements.

The chart below details the typical sensitivity, or limits of detection (LODs)[1] of the Niton XL5 in parts per million (PPM) for various elements in aluminum (Al), iron (Fe), copper (Cu), zinc (Zn) and tin (Sn) base metals. LODs are calculated as three standard deviations (99.7% confidence interval) for each element, using 60-second analysis times per filter (120 seconds total analysis time).

Limits of Detection in ppm (mg/kg)
Time: 60s per filter

Element	Al base Metal	Fe base Metal	Cu base Metal	Zn base Metal	Sn base Metal
Bi	6	30	50	200	90
Pb	6	30	80	60	100
Hg	20	100	140	300	200
Pt	25	100	200	500	250
Ba	20	60	120	100	1000
Sb	10	30	40	30	250
Sn	10	30	50	50	N/A
In	6	20	20	20	200
Cd	6	15	25	20	200
Ag	N/A	N/A	N/A	N/A	N/A
Pd	3	15	15	15	40
Br	4	15	20	40	35
As	10	40	60	150	100
Zn	15	60	200	N/A	130
Cu	25	100	N/A	100	250
Ni	40	300	150	75	500
Co	60	1000	75	90	400
Fe	100	N/A	100	100	700
Cr	20	100	40	40	100
V	10	50	25	40	50
Ti	10	70	25	30	100

N/A = Not Applicable



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

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

Please note:

Ongoing research and advancements in our Niton XL5 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. In most cases, shorter times will provide you with the detection limits required. For example, if analysis time is reduced from 60 seconds per filter to 15 seconds per filter, then the detection limits obtained would be twice the values shown in the chart. Similarly, increasing the time of analysis will reduce the detection limits by the square root of the increased time.

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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