

ACCURATE ANALYSIS OF AIR PARTICULATES

Ensure full compliance with
US EPA IO-3.3 standard

READY-TO-USE EPA IO-3.3 COMPLIANT ANALYSIS SOLUTION

The presence of toxic pollutants in air is a subject of concern in countries around the world. One of the key aspects is the suspended particulate matter in air. Air particulates with diameters below 10 μm , known as PM10 and PM2.5, can be inhaled by humans and could result in health issues. The Environmental Protection Agency (EPA) in the US developed method IO-3.3 to determine the elemental composition of particulates collected on filter material. This method prescribes the use of X-ray fluorescence (XRF).

XRF is a non-destructive and straight-forward technique to analyze air filters; enabling the filter to be loaded in the sample holder and measured directly on the instrument. There is no need to dissolve the filters in acids before analysis which is required in alternative elemental analysis techniques. After analysis, the filter can be used for further analysis.

For easy adoption and implementation of the XRF method, Malvern Panalytical offers a factory calibration compliant with EPA IO-3.3 regulations for their Epsilon 4 benchtops. There is no need to invest in and acquire expensive and fragile standards.

EPA IO-3.3 compliant factory calibration

- Set up for the analysis of 46 elements, ranging from Na up to U.
- Factory calibration using more than 70 single element standards.
- Unique monitor, developed by Malvern Panalytical, to maintain application over time.
- Blank subtraction to correct for varying filter material types.

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H	He																	Li	Be	B	C	N	O	F	Ne																	Na	Mg	Al	Si	P	S	Cl	Ar	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	Cs	Ba	L	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	Fr	Ra	A	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts	Og	L	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	A	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

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**Malvern
Panalytical**
a spectris company

OUR UNIQUE SOLUTION FOR ELEMENTAL ANALYSIS OF AIR PARTICULATES

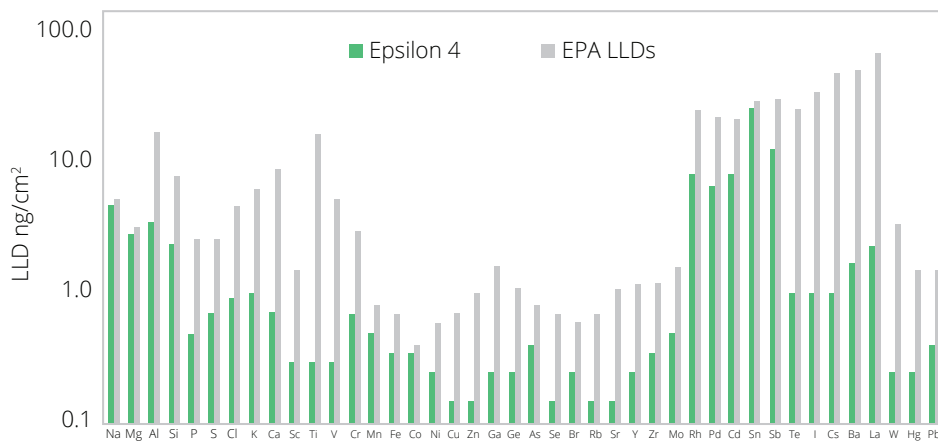
Epsilon 4 – efficient elemental analysis

- Small footprint.
- Calibration that lasts for years.
- Compliant results in 45 minutes.
- Load up to 10 samples at once.
- Variety of sample cups available for air filters with diameters ranging from 25 up to 47 mm.
- Full flexibility to set up own applications.
- Direct measurements of powders, liquids and solids.

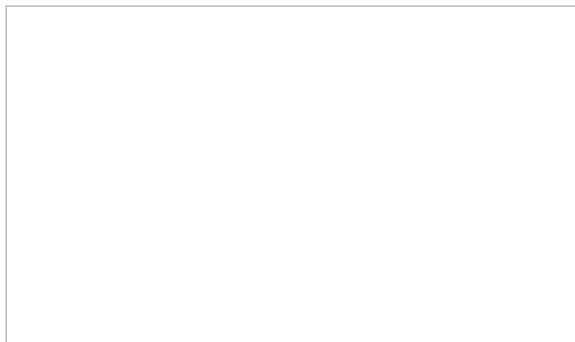


Detection limits are an important measure of an instrument's performance. The detection limits for this application were calculated from 20 replicate measurements of a blank sample and are based on 1 sigma (as specified in method IO-3.3).

The figure below shows a comparison between the LLD values reported in the EPA method and the LLD values obtained by Epsilon 4*, in 45 minutes. All LLD values are lower than the EPA limits.



* Results obtained with a 15W Ag-tube Epsilon 4 with a SDD30 detector



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