



## PRODUCT SHEET

### Resolve filter

#### Main Applications

- Source preparation for alphaspectrometry via microprecipitation (e.g. CeF<sub>3</sub>, BaSO<sub>4</sub>)

#### Packing

Order N°.	Form
RF-100-25PP01	Box of 100 Resolve filters (Ø 25 mm)
RF-50-47PP01	Box of 50 Resolve filters (Ø 47 mm)
RF-DF25-25PP01	Package of 25 Resolve® filter (Ø 25 mm) funnel units
RF-DF200-25PP01	Case of 8 packs of 25 Resolve® filter (Ø 25 mm) funnel units

#### Physical and chemical properties

Diameter : 25 mm / 47 mm

Pore size : 0.1 µm

Material : Polypropylene

#### Conditions of utilization

Recommended T of utilization : /

Flow rate : /

Filters have to be rinsed with Ethanol before use

Storage : Dry and dark

#### Methods<sup>1</sup>

Reference	Description	Matrix	Analytes	Support
SPA01	Cerium Fluoride microprecipitation for alpha spectrometry			

<sup>1</sup> Methods developed by Eichrom Technologies LLC.

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### RESOLVE® FILTERS

Resolve® filters are used to prepare sources for the alpha spectrometric determination of uranium, americium, plutonium and radium by micro-precipitation. Resolve® filters are made from polypropylene and are 25 mm or 47 mm in diameter with a porosity of 0.1  $\mu\text{m}$ .

Maximum peak resolution in alpha spectrometry requires as uniform a filter surface as possible to ensure a uniform deposition. Therefore, Resolve® filters undergo a strict quality control including an electron microscopic examination of the surface and an evaluation of the quality of the thin-layer deposits obtained by micro-precipitations with quality control specifications set to a peak resolution set at Full Width Half Maximum (FWHM)  $\leq 50$  keV for Am-241 and Am-243 (see Fig. 1).

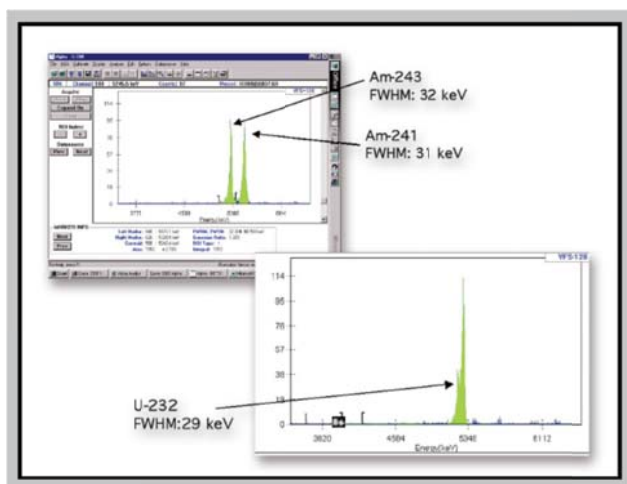


Figure 1 : Alpha spectra of QC samples of Am-241/3 and U-232, micro-precipitated source [1].

Resolve® filters have been evaluated for use for the determination of U, Am, Pu (micro-precipitation with  $\text{LnF}_3$ ) and Ra-226 (micro-precipitation with  $\text{BaSO}_4$ ) via alpha spectrometry, respectively figures 2 and 3.

Repeatability and reproducibility of U, Am, Pu and Ra-226 sources were determined with respect to the variation of peak area (Table 1) and FWHM (Table 2). Repeatability and reproducibility of the peak area and FWHM are good with standard deviations less than 6 % and less than 15 % respectively.

RN(*)	Repeatability		Reproducibility	
	Nb of	Standard	Nb of	Standard

	Replicates	Deviation (%)	Replicates	Deviation (%)
U-232	9	1.9	6	4.6
Am-243	10	1.4	6	2.2
Pu-239	9	4.1	6	6.4
Ra-226	10	3.1	6	4.6

Table 1 : Repeatability and reproducibility of the peak area for thin-layer deposit by micro-precipitation of U-232, Am-243, Pu-239 and Ra-226 on Resolve® filter. (\*)RN : Radionuclide.

RN(*)	Repeatability		Reproducibility	
	Nb of Replicates	Standard Deviation (%)	Nb of Replicates	Standard Deviation (%)
U-232	9	3.7	6	12.6
Am-243	10	7.3	6	12.3
Pu-239	9	9.0	6	9.5
Ra-226	10	11.4	6	10.1

Table 2 : Repeatability and reproducibility of the FWHM for thin-layer deposit by micro-precipitation of U-232, Am-243, Pu-239 and Ra-226 on Resolve® filter.

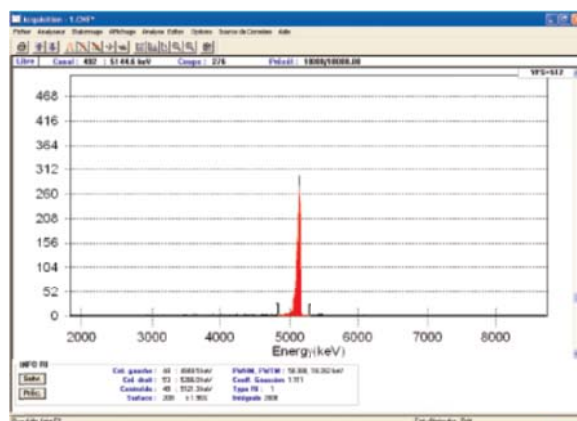


Figure 2 : Alpha spectra of Pu-239 micro-precipitated source. Resolution (FWHM) mean: 55.3 keV.

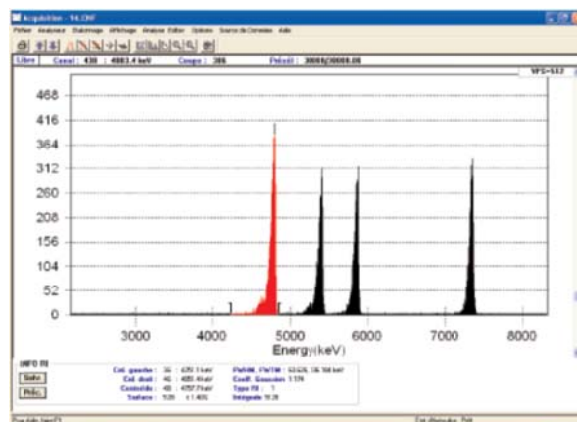


Figure 3 : Alpha spectra of Ra-226 micro-precipitated source. Resolution (FWHM) mean: 54.2 keV.

Radium radio-isotopes in general and Ra-226 in particular need specific conditions to be electro-deposited. Micro-precipitation of Ra-226 in with

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baryum sulfate offers an interesting alternative. Figure 4 presents the results obtained during a linearity test (varying Ra-226 activity) of the micro-precipitation of Ra-226. The results show that this preparation method of Ra-226 is efficient over a wide range of activities.

[1] Eichrom newsletter “Resolve® Filters & Disposable Funnel Units”, 2013, Eichrom Technologies

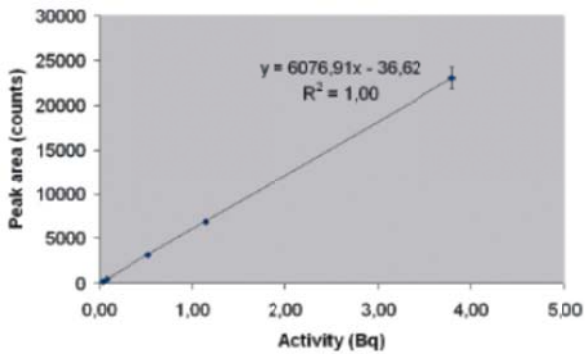


Figure 4: Linearity test, peak area at 4784 keV vs Ra-226 activity.

### Resolve funnel units

Resolve® filters funnel units (Fig. 4) preloaded with 25 mm diameter Resolve® filters for use with a vacuum box are available. Like the Resolve filters, the funnel units are designed to maximize analyte recovery and the resolution of the filter. The units are disposable, therefore eliminating the possibility of cross contamination between samples. They are also designed with a notch, allowing for easy removal of filters with tweezers for planchet placement.

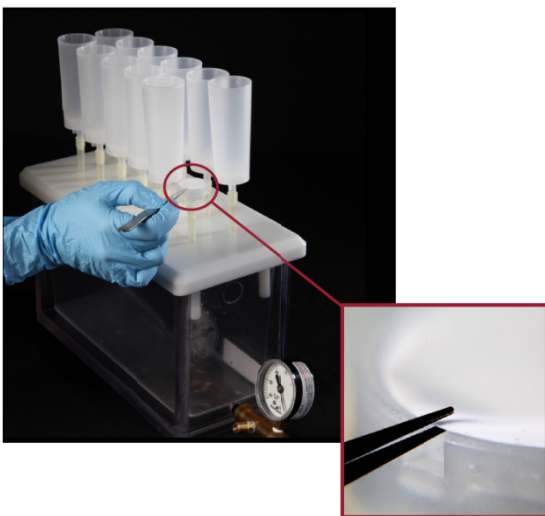


Figure 5: Resolve® filter filtration units for use with vacuum box [1].

### Literature