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# EDXRF1803 - RoHS PE-Pak Rapid Screening by XRF



## Scope

The polyethylene PE-Pak is demonstrated for RoHS Rapid Screening by XRF.

## Background

The Restriction on Hazardous Substances initiative (RoHS) limits the allowable amounts of the toxic elements chromium, mercury, lead, bromine, and cadmium in plastics and consumer goods. Energy Dispersive X-ray Fluorescence (EDXRF) is an accepted analysis technique for the rapid screening by XRF and quantification of the hazardous element according to RoHS norms. To meet the industry needs, Rigaku offers the [NEX DE VS](#) analyzer with automatic collimators and a camera for sample positioning and sample image, giving QA/QC technicians the means for fast and simple screening and analysis of materials that must conform to RoHS and similar directives.

### RoHS PE-Pak method: Fundamental Parameters (FP) Matching Library

- FP for flexibility in measuring diverse PE samples
- Factory Matching Library for Cr, Hg, Pb, Br, Cd, using CRMs
- Flexible Rigaku Matching Library software makes it easy for users to customize the Matching Library or create new Matching Libraries
- Software includes empirical calibration capability

## PE-Pak results: CRM check standard

The PE-Pak comes with one CRM check standard with certified assays for Cr, Hg, Pb, Br, and Cd. Measurement results of the CRM check standards are shown here using the PE-Pak method with Matching Library.

10 mm spot size applicable to NEX DE using autosampler tray for bulk analysis and NEX DE VS using single position Point Analysis.

<b>PE CRM Check Standard</b>					
<b>Units: ppm</b>					
10 mm collimator	Cr	Hg	Pb	Br	Cd
Certified assay	500 ± 20	499 ± 20	500 ± 20	250 ± 20	50 ± 20
NEX DE VS result	504	505	494	248	51

3 mm and 1 mm spot sizes applicable NEX DE VS using single position Point Analysis.

<b>PE CRM Check Standard</b>					
<b>Units: ppm</b>					
3 mm collimator	Cr	Hg	Pb	Br	Cd
Certified assay	500 ± 20	499 ± 20	500 ± 20	250 ± 20	50 ± 20
NEX DE VS result	504	500	491	254	49

<b>PE CRM Check Standard</b>					
<b>Units: ppm</b>					
1 mm collimator	Cr	Hg	Pb	Br	Cd
Certified assay	500 ± 20	499 ± 20	500 ± 20	250 ± 20	50 ± 20
NEX DE VS result	534	485	495	259	51

Certified assay standard deviation (2-sigma) = 4% relative

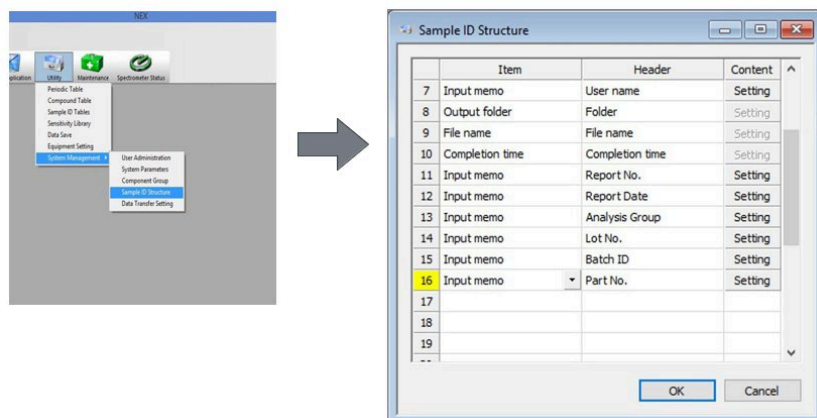
## User-defined RoHS Limits

The PE-Pak comes with the default RoHS Pass/Unsure/Fail judgment settings. NEX DE software allows the user to easily adjust and enter different limits as desired.

Output information						
Calculation parameter						
	Component	Output	Output digits	Lower limit	Unsure limit	Upper limit
1	Total	Yes	3 effective digits	No limit	No limit	No limit
2	Cr	Yes	3 effective digits	No limit	600.0000	1200.00000
3	Br	Yes	3 effective digits	No limit	600.0000	1200.00000
4	Hg	Yes	3 effective digits	No limit	600.0000	1200.00000
5	Pb	Yes	3 effective digits	No limit	600.0000	1200.00000
6	Cd	Yes	3 effective digits	No limit	60.0000	130.00000
7	As	Yes	3 effective digits	No limit	No limit	No limit
8	Sn	Yes	3 effective digits	No limit	No limit	No limit
9	Sb	Yes	3 effective digits	No limit	No limit	No limit
10	Ba	Yes	3 effective digits	No limit	No limit	No limit
11	Zn	Yes	3 effective digits	No limit	No limit	No limit
12	Polyethylene	Yes	3 effective digits	No limit	No limit	No limit

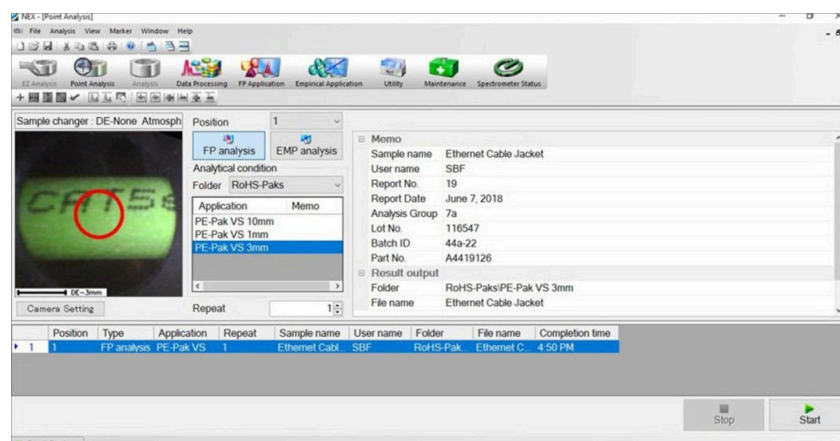
## User-definable RoHS report fields

The flexible Rigaku software allows users to design RoHS report field headers to suit specific reporting needs. Headers to report Sample Name and Analyzed By are automatically set by default and users simply enter up to six additional report memo headers as desired.




## Point analysis screen – NEX DE VS

Operator simply selects method, enters sample name and report fields, then presses Start.



## RoHS report

A RoHS report is automatically generated that includes the user defined fields, sample image, and element judgment.

Report No	12-536	Report Date	8/30/2018		
Analysis Group	143	Analyzed by:	sof		
<b>Hazardous Element Analysis Report</b>					
Analyzed Date: 8/30/2018 10:06 AM					
<b>1. Sample Information</b>					
Sample name	Cable Jacket				
Lot No.	14231567				
Batch ID	19-72				
Part No.	86746				
Material	PE				
<b>2. Analysis Results</b>					
Method	PE-Pak VS 3mm				
Preparation					
Atomic name	Chromium	Bromine	Lead	Mercury	Cadmium
Atomic symbol	Cr	Br	Pb	Hg	Cd
Judgment	Pass	Pass	Pass	Pass	Pass
Analyzed value	0.0100	54.6	2.94	0.0100	0.0100

## Conclusion

The NEX DE VS with automatic collimators and camera provides excellent sensitivity and reliable precision for RoHS rapid screening by XRF down to 1 mm spot size. Simple Point Analysis Screen allows operators to easily enter report information as designed using customizable report headers and automatically generates an RoHS report complete with sample image, analysis results, and Pass/Unsure/Fail judgment.

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## Related products



### NEX DE Series

High-power 60 kV EDXRF systems delivering speed, precision, and small spot measurements