Application Note EDXRF1807

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EDXRF1807 - RoHS Lead-Free Solder-Pak Rapid Screening by XRF

Scope

The lead-free Solder-Pak is demonstrated for RoHS rapid screening by XRF and WEEE directives.

Background

The Restriction on Hazardous Substances initiative (RoHS) limits the allowable amount of lead in solder. 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 Pb-Free Solder-Pak method: Fundamental Parameters (FP) Matching Library

- FP for flexibility in measuring diverse solder samples
- Method set for typical tin-based or tin-silver solder
- Factory Matching Library for Pb using CRMs
- Flexible Rigaku Matching Library software makes it easy for user to customize the Matching Library or create new Matching Libraries
- Software includes empirical calibration capability

Solder-Pak results - CRM check standard

The Pb-free Solder-Pak comes with one CRM check standard with certified assay for Pb. Measurement results of the CRM check standards are shown here using the Solder-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

CRM Check Standard **Units: Mass%**	
10 mm collimator	Pb
Certified assay	0.107 ± 0.006
NEX DE VS result	0.110

3 mm and 1 mm spot sizes applicable NEX DE VS using single position point analysis.

CRM Check Standard **Units: Mass%**	
3 mm collimator	Pb
Certified assay	0.107 ± 0.006
NEX DE VS result	0.110

CRM Check Standard **Units: Mass%**	
1 mm collimator	Pb
Certified assay	0.107 ± 0.006
NEX DE VS result	0.104

Certified assay standard deviation (2-sigma)

User-defined RoHS limits

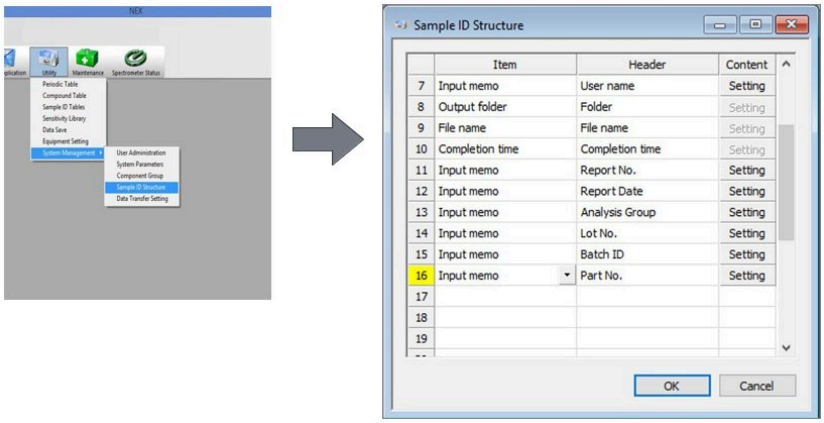
The Pb-free Solder-Pak comes with the default RoHS Pass/Unsure/Fail judgment settings. NEX DE software allows the user to easily adjust and enter different limits as desired.

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

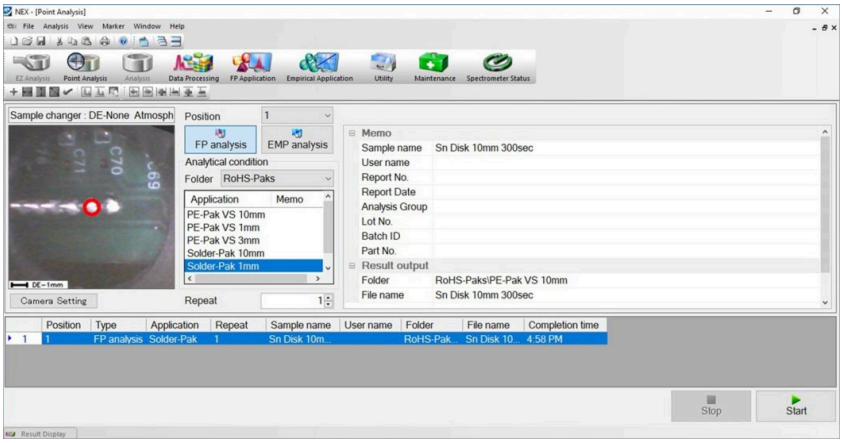
User-definable RoHS report fields

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 the user simply enters up to six additional report memo headers as desired.



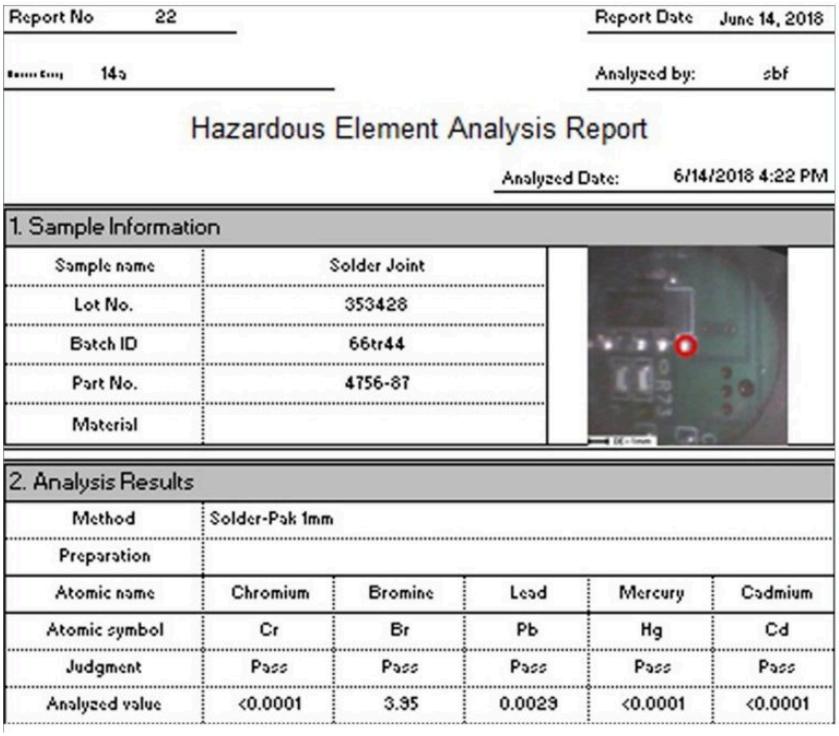
Point analysis screen — NEX DE VS

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 22

Report Date June 14, 2018

Analyzed by: sbf

Hazardous Element Analysis Report

Analyzed Date: 6/14/2018 4:22 PM

1. Sample Information

Sample name	Solder Joint
Lot No.	353428
Batch ID	66tr44
Part No.	4756-87
Material	

2. Analysis Results

Method	Solder-Pak 1mm				
Preparation					
Atomic name	Chromium	Bromine	Lead	Mercury	Cadmium
Atomic symbol	Cr	Br	Pb	Hg	Cd
Judgment	Pass	Pass	Pass	Pass	Pass
Analyzed value	<0.0001	3.35	0.0023	<0.0001	<0.0001

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.

Related products

NEX DE Series

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