

Application Note

ComPact5 / ComPact5 PIN

Measurement of immersion Ag coating

Introduction

The traditional galvanic layers give more and more way in PCB production to immersion coating. It is especially important, since the usual leaded solder will be substituted for no Pb containing materials as immersion Sn or Ag. The measurement of these layers with X-ray Fluorescence Spectrometry becomes complicated because of their extreme thinness. The new instrument generation with high-resolution detectors possesses better sensitivity and increase measurement accuracy and repeatability.

Measuring conditions

Two ComPact 5 instruments with micro focus Be glass window x-ray tube were compared:

1. with proportional counter detector and 0,2 mm spot size.
2. with Si-PIN-diode detector and 0,8 mm spot size.

Two test samples with exposition time 1 minutes and 2 minutes respectively and three PCB cards with an immersion Ag coating were measured. The measuring time was 60 second.

Measurement results

Figure 1 shows the example x-ray spectra of measured samples.

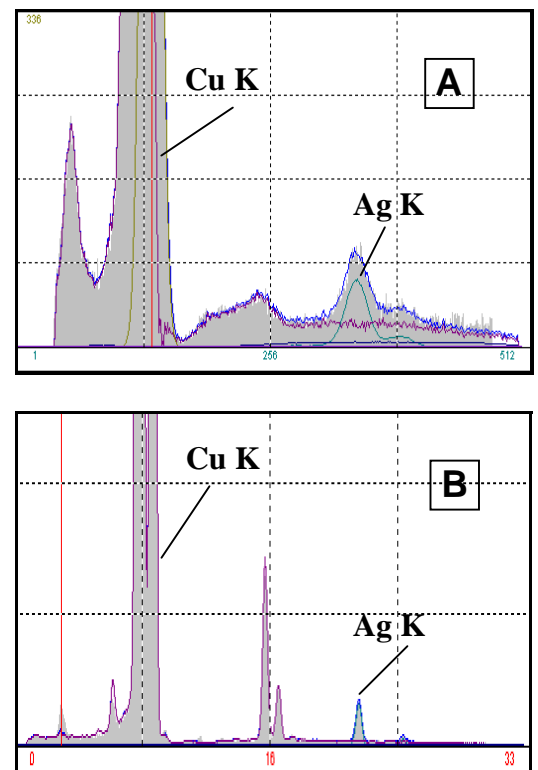


Fig. 1. Spectra of an immersion Ag coating on Cu:

- A** - measured with proportional counter;
- B** - measured with PIN diode

The measurement repeatability was calculated from 10 measurements per sample. The results are present in the follow table.

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Comparison table

ComPact 5 PropCounter				
	Mean value μm	1 Sigma μm	Minimum μm	Maximum μm
377M-1min	0.177	0.004	0.169	0.183
377M-2min	0.221	0.007	0.213	0.237
PCB 377M	0.466	0.011	0.448	0.484
Sample 2	0.234	0.008	0.221	0.246
Sample 3	0.182	0.006	0.174	0.194
ComPact 5 PIN				
	Mean value μm	1 Sigma μm	Minimum μm	Maximum μm
377M-1min	0.175	0.003	0.170	0.180
377M-2min	0.217	0.005	0.211	0.224
PCB 377M	0.464	0.007	0.455	0.475
Sample 2	0.220	0.004	0.214	0.225
Sample 3	0.181	0.003	0.175	0.186

Conclusion

The measurements on two ComPact 5 instruments shows the significant better peak-to-background ratio and accordingly the higher sensibility to very thinn layers of immersion Ag coating for instrument with PIN diode. The measurement repitibility is by PIN diode nearly two times better as by proportional counter.

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