

# A Simple Solution for RoHS Compliance

The responsibility for RoHS compliance and supporting documentation may look like a daunting task. However, there is a simple solution for RoHS compliance testing that can easily be used by manufacturers and everyone in the supply chain as well as by government regulators.

The European Union's (EU) Restriction of Hazardous Substances (RoHS) Directive states certain electrical and electronic equipment (EEE) materials for import into the EU may not contain levels of lead (Pb), mercury (Hg), hexavalent chromium (Cr6+) or polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) at levels over 0.1%, or cadmium (Cd) at levels over 0.01%. Many other countries are rapidly adopting regulations that emulate the EU Directive. Consequently, requirements concerning the reduction of these toxic substances in EEE products will affect everyone in the worldwide supply chain of EEE commerce.

## Proving compliance by testing

There are several ways to demonstrate compliance with the RoHS Directive. At one or several points in the process, testing will be required. Suppliers of materials, components, and parts will have to test to prove compliance. Major manufacturers will show due diligence by testing to confirm compliance by their component and subassembly suppliers. Finally, governments will carry out their own intermittent testing to monitor compliance.

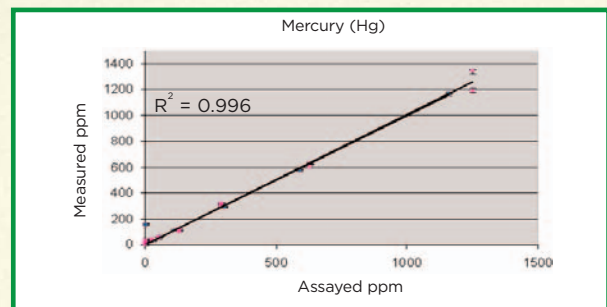
The fact that so many people from so many organizations will be testing for compliance opens potential problems of test results without a common playing field. The Innov-X Systems Portable XRF Analyzer easily tests for regulated substances at the compliance levels. It is a simple and straightforward testing tool that can be used by everyone involved in EEE commerce, including regulators. It can even be used for Waste Electrical and Electronic Equipment (WEEE) regulations and subsequent recycling efforts.

## Cooperative industry efforts

Electrical and electronic equipment industry leaders are well aware of the challenge of testing without a common playing field and are using best practices to put testing mechanisms in place to comply under those conditions. Technical representatives from leading suppliers in the electronics industry as well as scientific leaders from uni-

versities and research institutes worldwide joined together to develop test procedures that would work on a global basis. The International Electrotechnical Commission-Advisory Committee on Environmental Aspects (IEC-ACEA) Working Group put together procedures for RoHS compliance testing to help manufacturers and others in the supply chain standardize on common, accepted testing techniques. The procedures offer standard, comparative techniques that have been accepted in the industry for years and allow a common playing field for manufacturers and regulators alike.

## Mercury in Plastics



Comparison of XRF results with assayed values containing Hg, 120 sec. measurement. Source: Innov-X Systems Inc., Woburn, Mass.

## X-ray screening tests are solution

The IEC-ACEA procedures recommend XRF for screening EEE materials for RoHS compliance. Portable, handheld EDXRF is the simplest, most cost-effective technique available. It enables anyone to test for Pb, Hg, Cd, Cr and Br anywhere in minutes. The Innov-X Systems Portable XRF has preprogrammed RoHS Compliance Pass/Fail levels for quick determinations for RoHS compliance. The integrated Pocket PC enables results to be viewed, recorded, transmitted wirelessly, or stored as needed for supporting documentation. The Innov-X Systems Alpha Series takes the guess work out of compliance testing and offers a standard universal tool for RoHS Compliance testing. Among benefits of the technique are:

- Nondestructive measurement.



- Quick results (typically one half to two minutes) to screen for all the elements simultaneously.
- Very little or no sample preparation.
- Can easily test different areas of the sample.
- Integration of the system to computer automation.

### Lead-free initiatives

Lead has been used since ancient times because it is abundant, easy to work with, melts at a relatively low temperature, and resists corrosion. Lead is still a good metal to work with yet carries serious health consequences.

Consequently, of all the metals modern-day manufacturers are concerned with finding an adequate replacement for, lead is a top priority.

Lead has been used extensively in solders and finishes on PC Boards. The ever increasing disposal of outdated electronic equipment has caused world governments to mandate reduction or elimination of its use in EEE manufacture. Consequently, alternate high-performance materials are quickly being developed to replace it. Sn, the most widely used replacement metal, can grow "whiskers," or filamentary corrosion, which eventually shorts out the electronics. Other pure metal and alloy substitutes, such as silver (Ag), copper (Cu), zinc (Zn), bismuth (Bi), indium (In), antimony (Sb), and Cd, are also potential causes of failure for electronic equipment if not used properly.

### Substitutes for lead being sought

Lead-substitute materials are being developed and evaluated as quickly as possible to meet these demands. There are specific Pb-based solder and alloy exemptions in the RoHS Directive; however, many have deadlines for their exemptions. Once the optimal compositions for replacement Pb and its alloys are determined or it has been determined that Pb will continue to be used for specific applications, quality control testing must be maintained. It is still imperative that suppliers of critical components properly label their materials and manufacturers confirm compositions before use.

### Micro-Focus XRF Analyzer

In some applications, it is necessary to view only a small point, such as a solder connection on a PCB, connector, or chip. The Innov-X HAWK-i XRF system is a bench-top micro-focus analyzer for precision testing of smaller components and nonhomogeneous samples. Its beam can be focused on a spot as small as 0.2mm in diameter, and can be positioned across a test sample using an X-Y stage. It affords elemental analysis capabilities similar to the Alpha Series in a bench style unit.

### X-ray testing screens for lead and its substitutes

The Innov-X Portable EDXRF Alpha Series Analyzer can measure Pb and the various replacement materials easily and quickly. It can analyze up to 20-25 elements simultaneously. The integrated Pocket PC enables results to be viewed, recorded, transmitted wirelessly, or stored as needed for supporting documentation. Within the limitations of the EDXRF method, fast screening of objects violating RoHS has become an important tool for manufacturers to mitigate the impact of RoHS.

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