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CPSC RELEASES STUDY ON EFFECTIVENESS OF XRF FOR MEASUREMENT OF LEAD IN PAINT

A report released by the CPSC staff, [*Study on the Effectiveness, Precision, and Reliability of X-ray Fluorescence Spectrometry and Other Alternative Methods for Measuring Lead in Paint*](#), dated August 2009, examines the possibility of the validation of techniques for measuring lead content in paint. While the CPSC staff report finds that insufficient analytical support is currently available to validate a method employing x-ray fluorescence (XRF) for the determination of lead in paint and similar surface coatings, the staff concludes that the use of XRF techniques to measure lead in plastics yields accurate results so long as the appropriate test methods are followed and Standard Reference Materials (SRMs) used.



The current method endorsed by the CPSC for the determination of lead content in paint and surface coatings, CPSC-CH-E1003-09, *Standard Operating Procedure for Determining Lead (Pb) in Paint and Other Similar Surface Coatings* (March 2009), requires the removal of the paint or similar material via extraction through a solvent or scraping. The sample is then dissolved in nitric acid and analyzed by way of an acceptable spectroscopic method, e.g. flame atomic absorption spectrometry (FLAA) or inductively coupled plasma mass spectrometry (ICP-MS). While this wet chemistry technique follows the currently accepted guidelines set by the CPSC, in a large scale implementation of compliance efforts such as that required under the CPSIA, this method is not only relatively slow but also costly in terms of product destruction, materials and manpower and unwieldy in terms of supporting enforcement efforts.

In contrast, the implementation of methods employing XRF spectrometry would provide relief in the form of a less costly, more portable, less time intensive alternative to wet chemistry techniques that would not normally destroy the product being tested. While the use of XRF may be attractive, according to the CPSC staff report, the lack of SRMs and standard methods remain as limiting factors for the validation of XRF techniques.

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The CPSC staff concludes that in order to certify a product to CPSIA requirements XRF technology, while suitable in many cases for homogeneous polymeric materials, must be followed up by wet chemistry techniques if the results of the analysis yields lead content at 200 mg/kg or more in the sample. However, for the determination of lead in paint and surface coatings, according to the report, the CPSC staff finds that XRF detection is unsuitable for the certification of CPSIA compliance due to the pronounced lack of SRMs and analytical standards.

The CPSC staff is currently working with NIST, the National Institute of Science and Technology, in order to develop the SRMs necessary to validate analysis of lead in paint and surface coatings. Further, the report indicates an on-going collaboration with ASTM in the development of a new standard for the detection of lead in paint and surface coatings using energy dispersive x-ray spectrometry, WK21957, headed up by the ASTM International Committee F40 on Declarable Substances.

While the report indicates that more work is necessary before XRF detection of lead content in paint and surface coatings can be validated, the report suggests that XRF technology provides a suitable method for the quantitative analysis of lead in homogeneous plastics, pointing to use of consensus standards, such as ASTM F2617-08, and the availability of SRMs from both commercial sources and public institutes. Citing internal and external data, the CPSC staff notes that suitable materials for analysis via XRF would include homogenous plastic and polymeric materials with appropriate surface characteristics and geometry.

SGS will follow up and inform interested parties as developments on CPSIA and other legislation occur.

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FOR ENQUIRIES:

Global Competences Support Centre: gpsc@sgs.com
 Sanjeev Gandhi, Tel: +973-461-7924 or Sanjeev.Gandhi@sgs.com
 HingWo Tsang +852 2774 7420 or Hingwo.tsang@sgs.com

Asia – Hong Kong. Tel: +852 2334 4481 Fax: +852 2144 7001 mktg.hk@sgs.com
 Australasia _ Perth. Tel: +61 (0) 3 9790 3418 Fax: +61 (0) 3 9701 0988 au.cts@sgs.com
 Europe – London —UK. Tel: +44(0) 20 8991 3410 Fax: +44 (0) 20 8991 3417 gb.cts.sales@sgs.com
 Africa & Middle East – Turkey. Tel: +90 212 368 40 00 Fax: +90 212 296 47 82 sgs.turkey@sgs.com
 Americas – USA. Tel: +1 973 575 5252 Fax: +1 973 575 1193 Marketing.CTS.US@sgs.com

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