FIRST Newsletter

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Testing for Lead in Children's Jewelry

Kimberley Russell, Bruker Nano Analytics GmbH, Germany

The long-term harmful effects of lead (Pb) exposure to children under the age of twelve are well-documented. Unfortunately, some children's jewelry contains Pb. The good news is there is a fast, straightforward, and nondestructive method to test children's jewelry for dangerous levels of Pb.

Pb has historically been used in jewelry for a variety of purposes. The potential risk of purchasing new jewelry with high Pb content is greatest with jewelry that contains minimal, if any, precious metals. It's important to keep in mind that Pb in jewelry does not enter the body by simply wearing it. The way Pb can enter the body is if it is put it in the mouth, which is not an unusual thing for a child to do. If the Pb mixes with saliva or stomach acids, it can leach out into the body. Catalytic converters which are no longer useful are recycled. The precious metals recovered are sold to use for other applications. Therefore, it is critical to know the composition of the precious metals recovered from ACCs.

The use of Pb in consumer products was first banned by the European Union in 2006 with the Restriction of Hazardous Substances Directive. EU's REACH program set a limit of no more than 0.05% (or 500 PPM) Pb by weight in consumer products, which includes children's jewelry. The United States issued limits on Pb in children's jewelry through the Consumer Product Safety Improvement Act with the American Society of Testing and Materials. ASTM's specification set a limit of no more than 0.01%

(or 100 PPM) Pb by weight in jewelry for children under 12 years of age. Other regions have their own regulations.

Portable XRF Lead Testing Solution

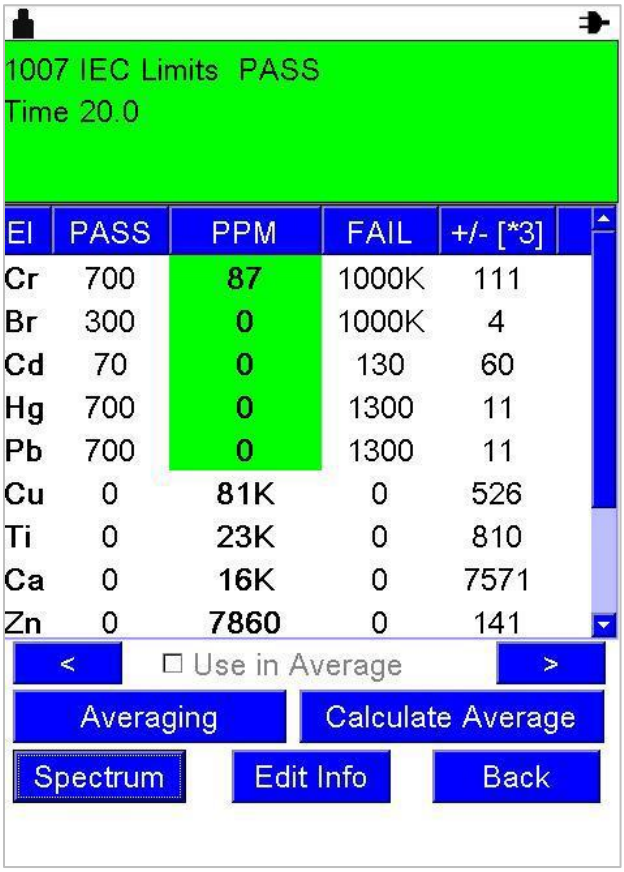
There are many ways to test jewelry for lead. Portable X-Ray Fluorescence (PXRF) is popular because it is fast, accurate, straightforward to use, and, very importantly, it is non-destructive. It will not damage the piece of jewelry in any way. It doesn't require scrapings to be taken, spots to be burned, or acids to be dissolved on it. One thing that makes it easier to understand results is the ability to set up pass/fail criteria for the Pb measurement.

An important benefit of using PXRF is its mobility. The analyzer can be taken to the samples for testing; the jewelry doesn't need to be sent to a lab for testing. And, results can be printed out or saved right then and there.

Bruker's Portable XRF Solutions

Bruker's CTX is a portable benchtop XRF which is a self-contained, safety interlocked unit with touchscreen operation accessible in the front. Bruker's S1 TITAN handheld XRF can be set up in a test stand for small samples or used by simply holding it and touching it directly onto a larger sample.

Bruker's portable benchtop and handheld XRF analyzers can be pre-programmed with a ready-to-go Restricted Materials Calibration which includes Pb measurements. An internal camera can be used to position the sample directly in the beam of the energy source. Pre-installed or user created Pass/Fail limits can be selected from a pull-down menu. An indication of pass or fail, along with the concentrations of the elements can be seen on the user screen in less than 30 seconds.

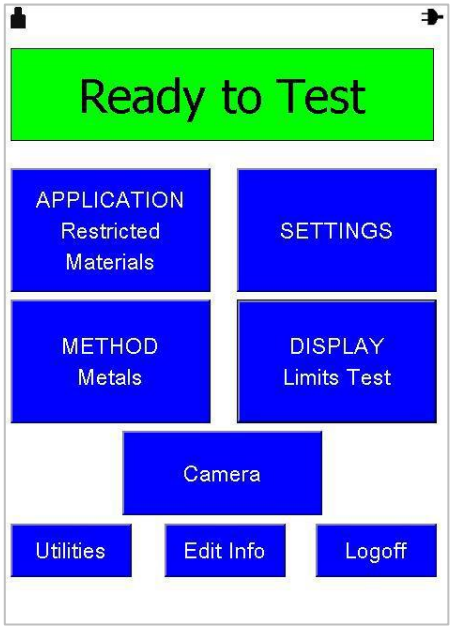


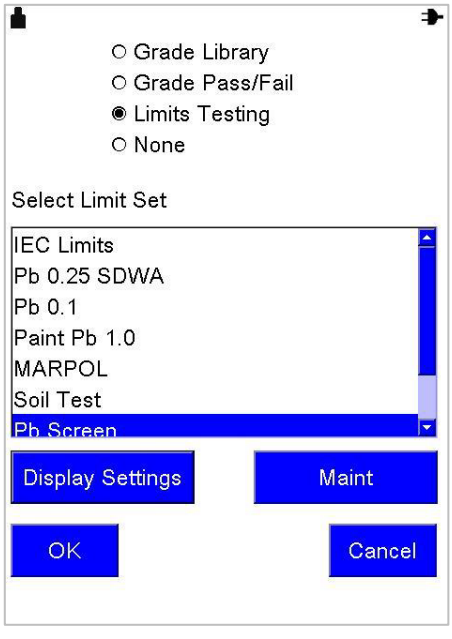
Fast & Straightforward Testing

Bruker's PXRF analyzers provide nondestructive measurements of elements from magnesium to uranium with touchscreen operation and easy-to-read, understandable results.

PXRF testing of Pb in children's jewelry is a fast and simple operation with minimal steps.

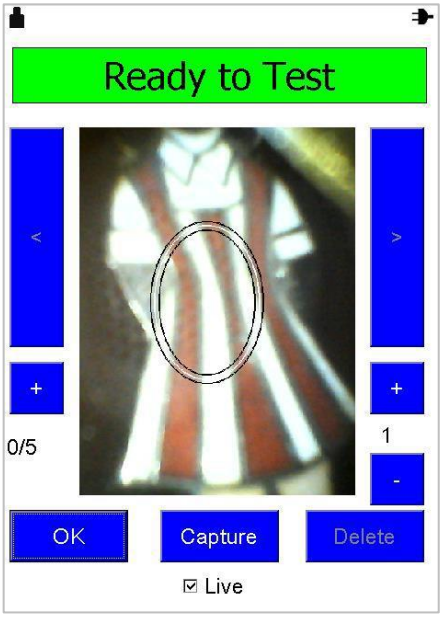
- Ensure the right calibration is set, in this case Restricted Materials

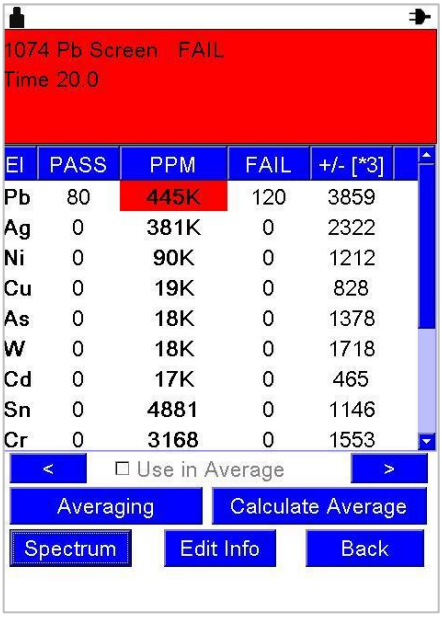




- Select the pass/fail limits criteria from the pull-down menu
- Place the side of the sample you want to analyze on the window and utilize the internal camera to ensure sample placement
- Press the trigger switch to start the test

In under 30 seconds, it is obvious if a piece of jewelry fails the Pb test. In the example below, it fails at 44.5% Pb. It's that simple to find out if a piece of jewelry has dangerous levels of Pb.





Bruker Nano Analytics
Berlin, Germany
info.bna@bruker.com
www.bruker.com/BNA