

# Heavy Metal Detection

## Organization

University of Missouri, Columbia

## Industry:

Environmental Monitoring &  
Chemical Analysis

## Researchers:

Randy Curry, Professor EE  
Sarah Mounter, Professor EE  
David Bryan, CEO LightThinking

## Status of Intellectual Property:

Provisional patent No. 62/457071

**Next Steps:** Convert to a Non-Provisional Patent and develop a prototype

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## Wanted

**Experienced innovator to license University intellectual property to commercialize handheld, remote laser induced breakdown spectroscopy devices.**

## Customer Problem

Identifying contaminants that can be characterized by the presence of heavy metals is a challenge. The heavy metal in counterfeit products can be detected and quantified by a portable and/or handheld instrument. Heavy metals – such as chromium, lead, cobalt, cadmium, mercury, nickel – and semi-metals – such as antimony and arsenic – can result in substantial health risks including cancer. These metals are found to be an identifier in a high percentage of counterfeit products such as cosmetics, food products, pharmaceuticals and personal care products. Although this product would not replace more sophisticated regulatory compliance laboratory analysis required by FDA and WHO, this instrument and system could provide important initial screening and analysis.

## Potential Market Uses

This innovation provides a rapid screening instrument and system of finished products.

How can it be used in the market? This innovation could be implemented in a variety of ways to screen finished products, to analyze raw materials, or could be used to remotely analyze hazardous waste with decreased safety risk of personnel.

Who would the customers likely be? Customers on the one hand could be producers of products who want to decrease the losses due to counterfeit finished products and increase quality by screening raw material suppliers. Governments or environmental consulting organizations could use these products to screen for regulatory compliance.

Use case: A cosmetics company wants to employ this technology at a greatly reduced cost to obtain detection and quantification using such a portable instrument and system of heavy metal contaminants in counterfeit cosmetics.

## Market Size

The counterfeit cosmetics problem is estimated to be a \$56+ billion annual problem for the cosmetics industry.

### Innovation

See diagram below of design concept. Further details are not yet published.

### Stage of Development

Early stage development conducting tests and completing design to build prototypes.

### Competitive Advantages

Mass spectrometry and other laboratory-based analysis instruments and methods to identify heavy metals and contaminants under FDA and WHO procedures.

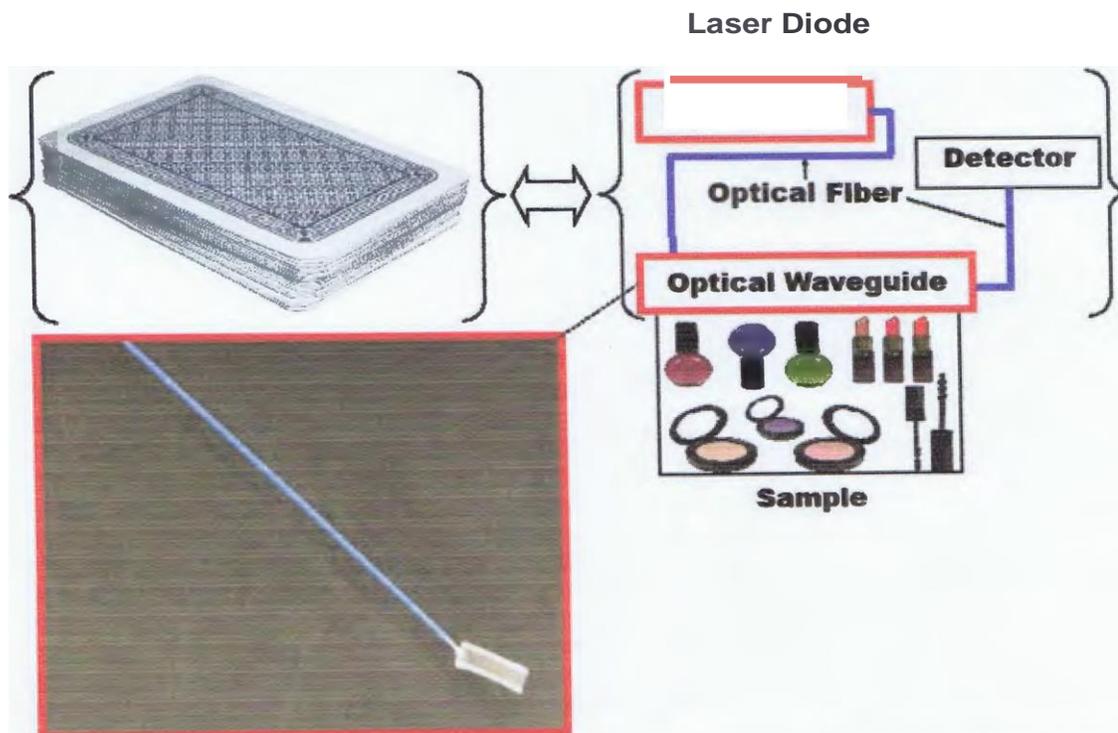


Figure 1. Schematic diagram of LIBS system and proprietary fiber optic waveguide system.