



Root cause analysis of foreign particles in pharmaceutical products

## EFFICIENT PARTICLE IDENTIFICATION BY VISUAL AND CHEMICAL ANALYSIS USING LIBS

Particulate contamination can occur in the pharmaceutical industry from initial R&D to packaging of the final product.

It is important to understand the particle composition and determine the potential impact on safety and quality. To find the source of contamination, often the methods used for chemical particle analysis are complex and time consuming.

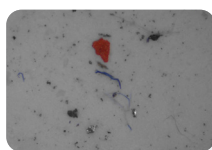


**Laser induced breakdown spectroscopy (LIBS)** enables simultaneous visual and chemical analysis. The DM6 M LIBS 2-in-1 solution allows fast particle identification:

- > Performed with a single system
- > Happens in 1 workflow step
- > Requires no further sample preparation
- > Eliminates sample transfer to additional analytical devices

Plastic, glass, and metal particles can be distinguished by their visual appearance and spectral fingerprint. LIBS allows even further differentiation between different types of metals & glass and allows a general identification of organic material.

# EFFICIENT ROOT CAUSE ANALYSIS OF FOREIGN PARTICLES IN PHARMACEUTICAL PRODUCTS



## Particle visualization

Find particulate contamination by microscope inspection.



## Detection and counting

Detect and count particles.



## Particle classification

Classify them according to their size and by visual appearance.



## LIBS analysis

Carry out the chemical analysis within a few seconds.



## Particle composition determination

Compare the spectra to identify materials.

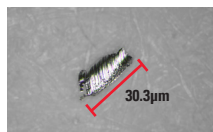
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## DM6 M LIBS for root cause analysis of particulate matter in pharmaceutical industry

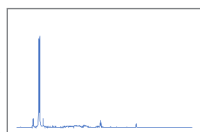
LIBS is capable of fast multi-element analysis. The combination of visual and chemical information enables the identification of particulate material down to the microscale within a few seconds.

For fast root cause evaluation, visual and chemical analysis of particles can be done using an optical microscope combined with a LIBS system in one system to determine the source of the particle.

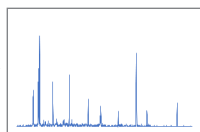
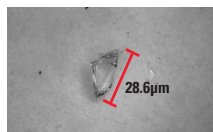
Visual inspection, counting and measurement



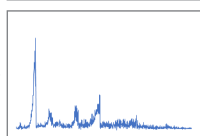
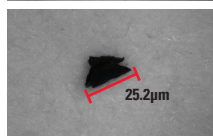
Chemical analysis for material identification



Aluminum alloy from vessel cap



Glass fragment with complex chemical composition



Unspecific plastic particle



Leica Microsystems CMS GmbH | Ernst-Leitz-Strasse 17–37 | D-35578 Wetzlar (Germany)

Tel. +49 (0) 6441 29-0 | F +49 (0) 6441 29-2599

[www.leica-microsystems.com](http://www.leica-microsystems.com)

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