Customer driven innovations

CILAS engineers have over forty years of experience designing laser particle size analyzers for both research and industrial applications. Since developing the world’s first laser particle size analyzer, CILAS has continued to provide innovative solutions in the laser particle size analysis field, including:

- 1969 invention of the Laser Particle Size Analyzer
- 1970’s commercial launch of the first industrial Laser Particle Size Analyzer “715” with integrated processor and display
- 1982’s commercial launch of the “HR850”, first Laser Particle Size Analyzer with extended range using the PM technology
- 1987 first calibration of a Laser Particle Size Analyzer with CRM - Certified Reference Material
- 1990 invention of multi-lasers technology for small and large particles (patent)
- 1992 invention of the first “submarine” Laser Particle Size Analyzer with the Ifremer laboratory
- 1995 the “2 in 1 design”: first Laser Particle Size Analyzer with dual dispersion mode
- 2000 first size & shape dual Laser Particle Size Analyzer
- 2004 invention of the DJD – Dry Jet Dispersion - technology
- 2007 launch of the new shape analyzer
- 2008 commercial launch of the 1190 product line with enhanced hardware & software for superior results

The CILAS line of laser particle size and shape analyzers are designed to be the most technologically advanced products on the market, ensuring the most user friendly and rugged analyzers available anywhere.
Cement & building materials

Over forty years ago, CILAS was contacted by a leading cement manufacturer to develop a new technique for particle size measurement. CILAS engineers used their laser expertise to develop the world’s first laser particle size analyzer. CILAS continues to provide innovative particle size and shape solutions for the cement industry. The cast-iron base plate makes the system rugged enough to be used in the harshest environment. The patented Dry Jet Dispersion technology allows precise measurement of difficult dry cement samples. For samples requiring the use of alcohol, CILAS’ alcohol recirculator provides an environmentally friendly solution.

Mining & minerals

Users in the mining & minerals industry need equipment that will work reliably in a harsh environment. CILAS particle size analyzers have all optical components mounted on a cast-iron base plate to ensure the system remains in alignment in any environment. The cost-effective 990 particle size analyzer has a standard measurement range of 0.2 to 500 microns, which is ideally suited for the needs of the mining and mineral industry. CILAS software allows the user to correlate its particle size results with data generated from sieves or sedigraphs. The integrated ultrasonics provides the user an effective tool to de-agglomerate samples.

Pharmaceutical & Cosmetics

Accurate, repeatable and traceable measurements are crucial in pharmaceutical applications. All CILAS particle size analyzers are calibrated to the ISO 13 320 and USP <429> standards to ensure the highest accuracy and repeatability. The SizeExpert software is 21 CFR Part 11 compliant for complete traceability of results. The extended measurement range of the CILAS 1190 allows analyzing the widest range of particles from raw materials to final formulations.

Food

Particle shape is an important parameter affecting the characteristics of food products. CILAS’ image analysis package gives customers a tool that provides both particle size and shape information. This information is used in production, inspection of raw material, product development, and quality control. The 1190 particle size and shape analyzer has a range of measurements from 0.04 to 2500 microns and allows both small and large particles to be characterized. The Free Fall module permits the non-destructive analysis of fragile samples.

Chemical & Petrochemical

Companies in the chemical and petrochemical industries are challenged with analyzing submicron particles. The CILAS 1090 is ideally suited for this measurement because it offers the world’s only dual laser design. Having two lasers guarantees the highest level of accuracy and precision from 0.04 to 500 microns. Only CILAS laser particle size analyzers fully integrate liquid and dry dispersion modes. This eliminates the need to manually switch, adjust or align any hardware. Solutions are available for all types of samples, including aggressive or expensive products and reagents. They allow the measurement of the size of particles and tiny drops which constitutes the emulsions. The alcohol recirculator can be used for chemicals that are soluble in water.

Specific needs

CILAS is of a very high standard for laser and optical integration and powders metrology. CILAS design department can customize particle size analyzers and adapt them to specific needs. Its experience in defence and space allows the company to provide solutions for particle size analyzers set up in severe environment: CILAS designed and manufactured a submarine particle size analyzer for IFREMER, Institut Français de Recherche pour l’Exploitation de la Mer.
CILAS particle size analyzers are fully ISO 13320 compliant to match customers’ demand for traceable, accurate and repeatable results. Whether running samples in dry or liquid dispersion modes, the complete analyzer is qualified using Certified Reference Materials. Due to CILAS’ unique laser only design, our analyzers set the market standard with measurement reproducibility of better than 1%. Accuracy and reproducibility are guaranteed for the life of the particle size analyzer.

**Short and stable optical bench**
CILAS’ patented optical bench design has all optical components permanently mounted on a cast iron base plate. This provides for alignment free operation even in the harshest environments. This rugged design means the system remains in alignment throughout the life of the instrument, guaranteeing the highest level of accuracy and repeatability.

**Dry Jet Dispersion technology**
Dry Jet Dispersion (DJD) Technology is CILAS’ patented new technique for efficiently dispersing and analyzing even the most difficult powders. This innovative design makes it easier for the operator to analyze dry samples. It features a mass flow regulator, which efficiently disperses dry samples regardless of the sample volume.

**Multiple laser technology**
The CILAS 1090 and 1190 particle size analyzers incorporate a patented optical design for diffraction analysis which includes multiple lasers. The CILAS 1090 has been designed with two lasers while the CILAS 1190 includes three lasers to cover the full measurement range. This unique design offers our customers an exceptionally high level of accuracy and reproducibility.
FULLY INTEGRATED SIZE AND SHAPE ANALYSIS

For many applications, particle shape information is a critical indicator of overall performance. To meet this demand, CILAS engineers have developed a system integrating both particle size and particle shape into a single elegant package. CILAS laser particle size analyzers provide you with an innovative solution for both particle size and shape measurements.

CILAS has developed the world’s only laser particle size analyzer with a fully integrated imaging system. This integrated solution allows the user to analyze the same exact sample in both laser diffraction and imaging modes. Images obtained from the imaging system provide an effective tool in validating the method. As an example, the operator can easily verify the presence of particle agglomerates which might have been reported as larger particles.

A large choice of images and parameters
Using the CILAS ExpertShape software, customers can obtain more than 100 particle shape properties such as roundness, convexity, sphericity, aspect ratio, area, shape factor and many more. This provides a cost effective tool for the analysis of particle shape.

The software can be configured to automatically acquire and analyze multiple samples, allowing the acquisition of hundreds of images and thousands of particles without any manual intervention.

A customized report
ExpertShape software allows the user to generate custom configured reports. These reports can be configured to export data in either HTML or Excel format. Reports can include the following information:

- Particle images
- Size distribution results
- Single and mean results
- Threshold displays
- Specific parameter trending

Integrated liquid and dry dispersion modes
Each system can be configured with fully integrated liquid and dry dispersion modes. This patented design eliminates the need for the operator to make any manual adjustments. Switching between dispersion modes is done through the software with just a click of the mouse. There is no need to exchange hardware, re-validate or re-align sensitive optics when switching dispersion modes.
Particle size analyzer specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>990</th>
<th>1090</th>
<th>1190</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Dispersion Measurement range</td>
<td>0.3 - 500μm</td>
<td>0.1 - 500μm</td>
<td>0.1 - 2500μm</td>
</tr>
<tr>
<td>Liquid Dispersion Measurement range</td>
<td>0.2 - 500μm</td>
<td>0.04 - 500μm</td>
<td>0.04 - 2500μm</td>
</tr>
<tr>
<td>Dry Dispersion</td>
<td>Venturi</td>
<td>Venturi</td>
<td>Venturi/Free Fall</td>
</tr>
<tr>
<td>Liquid Dispersion</td>
<td>2 peristaltic pumps/Ultrasounds/Stirrer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Accuracy</td>
<td>&lt;3%</td>
<td>&lt;3%</td>
<td>&lt;3%</td>
</tr>
<tr>
<td>Number of Lasers</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Laser Safety Classification</td>
<td>21 CFR – 1040/NF EN 60825-1/A2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Closed Cover</td>
<td>Class I of NF EN 60825-1/A2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Open Cover</td>
<td>Class III of NF EN 60825-1/A2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance</td>
<td>ISO 13320, 21 CFR-Part 11, USP 429, CE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>Length: 890 mm - 35 inches</td>
<td>Width: 530 mm - 21 inches</td>
<td>Height: 430 mm - 17 inches</td>
</tr>
<tr>
<td>Weight</td>
<td>48-63 kg - 106-139 lbs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CILAS Product Family

<table>
<thead>
<tr>
<th>Shape analyzer</th>
<th>option</th>
<th>liquid</th>
<th>option</th>
</tr>
</thead>
<tbody>
<tr>
<td>CILAS 990</td>
<td>Dry</td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>CILAS 1090</td>
<td>Dry</td>
<td>Dry</td>
<td></td>
</tr>
<tr>
<td>CILAS 1190</td>
<td>Dry</td>
<td>Dry</td>
<td></td>
</tr>
</tbody>
</table>

Accessories

CILAS ExpertShape

CILAS ExpertShape image analysis accessory provides customers with particle shape information. Image analysis can be used for method development. For customers requiring more extensive shape analysis of their particles, a wide range of shape parameters can be obtained in a quick and easy manner.

ExpertShape can be integrated with any new or existing CILAS laser particle size analyzer.

CILAS Alcohol Recirculator

Samples that are soluble in water require alcohol or a different dispersing liquid. The CILAS alcohol recirculator is designed for these applications. It will recirculate the dispersing liquid, which will lower your analysis and waste removal costs. Less solvent handling will result in a safer working environment.

The recirculator unit is fully automated using CILAS SizeExpert software and works in conjunction with the CILAS automated fill and rinse feature.
WORLDWIDE SERVICES & SUPPORT

Customer support
CILAS offers worldwide customer support through an extensive network of service centers. Factory trained service engineers are available for installation, training and application support.

CILAS is committed to your satisfaction. When you purchase a new CILAS particle size analyzer, our customer support centers provide assistance in the following areas:

**Applications development:** our experts help you with the development of new applications in particle characterization.

**Standard Operating Procedure (SOP) optimization:** we will work with you to optimize your standard operating procedure. We can help you save time by minimizing delays and improving the efficiency of your process.

On-site customer support services
CILAS support personnel provide:
> Installation, qualification, configuration and testing
> Hardware and software troubleshooting
> Preventive maintenance
> Timely, professional phone support
> Spare parts and consumables available locally

Training and seminars
Particle size and shape seminars are available worldwide to introduce new particle size and shape technologies and provide applications development. CILAS also provides training in the proper use of the analyzer, results validation and preventative maintenance. Training can be scheduled at the customer site or one of the worldwide service locations.

Training and seminars focus on sharing knowledge and expertise between our users and our technical specialists.