



Field Service | Process Diagnostics | LISP

Laser Isokinetic Sampling Probe

Field Sampling

CECO Peerless has developed a new field sampling tool for pressurized gas streams. The Laser Isokinetic Sampling Probe (LISP) was created, custom-designed and built to Peerless' specification to collect and weigh entrained liquids and solids up and downstream of separators/filters with very high system operating pressures.

The result? The most accurate and reliable equipment performance evaluations in the industry. The LISP makes it possible to learn two factors critical to determining equipment performance: mass separation efficiency and droplet/particle size removal efficiency. These results can be used to determine the optimum separation/filtration technology for the application.

Mass Separation Efficiency

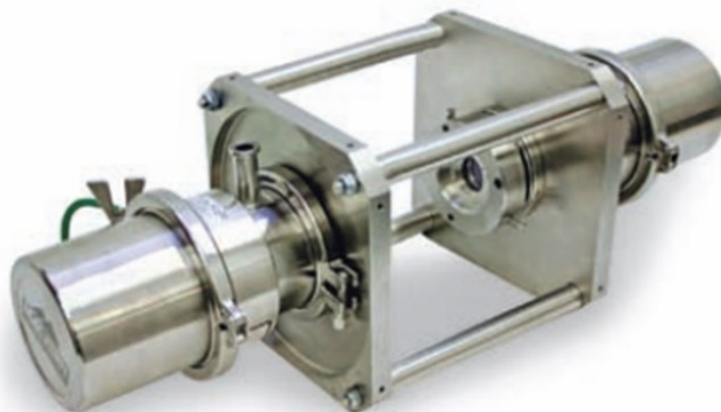
Sampling is conducted both up and downstream of the filter or separator. Direct comparison of up and downstream samples enables calculation of the mass loading, mass penetration, and overall mass separation efficiency calculation. A hydraulically controlled probe makes the pipeline traverse possible. Traversing is necessary to get an overall sample representative of the entire flow.

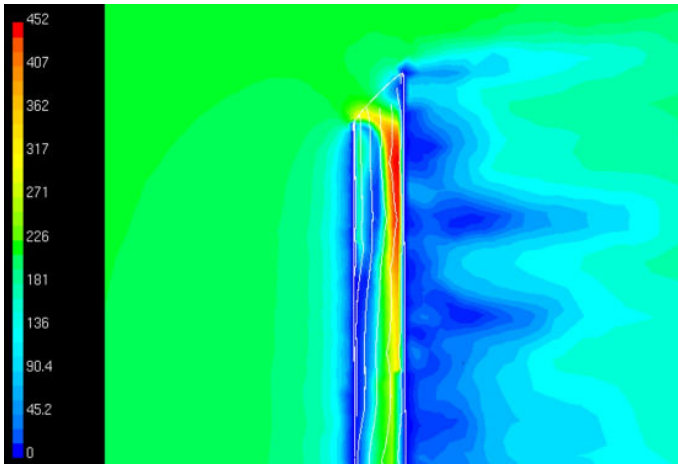
Droplet / Particle Removal Efficiency

The laser-based sizer/velocimeter can count and size droplets and solid particles from 0.3 to 200 microns in diameter with an exceptionally high degree of accuracy.

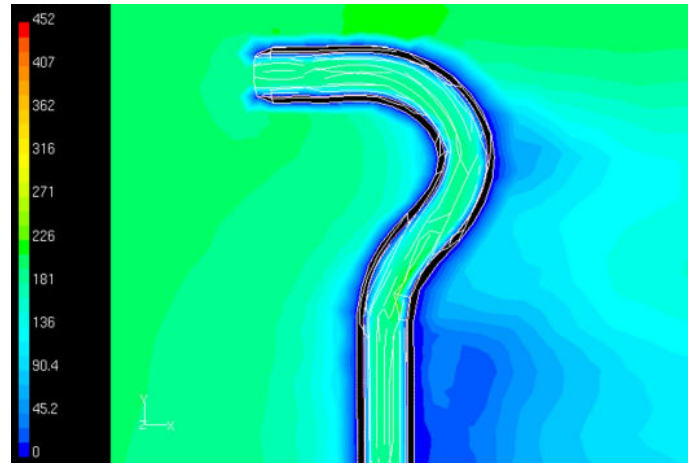
Since the droplet/particle count is taken up and downstream of the filter or separator, an efficiency ration can be generated for various droplet/particle sizes.

Knowing the droplet/particle size distribution can help to determine which type of available separation/filtration equipment is optimum for the job.





Red colour indicates inefficient measurement of sample properties due to inconsistent distribution.



Isokinetic probe design shows uniform distribution of sample improving measurement accuracy.

Isokinetic Sampling

Isokinetic sampling is necessary to avoid enriching or leaning of the gas with aerosols, droplets, or particles. Some testing services use a syringe-style probe. This type of probe can draw a very lean sample by missing most particles above 5 microns in diameter, resulting in serious misrepresentations of both mass concentration and mass efficiency of separation. A single 10 micron droplet is 1000 times more massive than a 1 micron droplet. Isokinetic sampling avoids such bias.

Technology Advantage

- Isokinetic probe tip allows for extracting a representative slipstream gas sample
- Laser testing at operating conditions matches the process
- Troubleshoot the issues that cause downtime in separation/filtration equipment

