A Focused Guide to Measuring Particles in Process

ParticleTrack Method of Measurement

1. The Probe: A laser is directed through rotating optics and focused to a tight beam spot at the probe window. When light hits a particle it is reflected back to a detector.

2. The Measurement: The intensity of the reflected light is analyzed over time allowing individual particles to be counted and the distance across particles (chord length) to be measured.

3. The Chord Length Distribution (CLD): Thousands of chord lengths are counted every second and a precise distribution sensitive to changing particle size and count is reported in real time.

4. The Trends: Mean chord length as well as counts in individual size classes can be trended over time, allowing changing particle systems to be studied in real time without having to take a sample.

5. The Process: By studying how particles change as process conditions are varied, scientists can determine which process parameters will deliver particles with the appropriate attributes.

Tracking Common Particle Mechanisms

- **Primary Nucleation**
  - Unweighted CLD: Enhanced resolution to fine particle changes
  - Square-Weighted CLD: Enhanced resolution to coarse particle changes
  - Trends: Track size and count in individual size classes

- **Growth**

- **Agglomeration**

- **Breakage**

- **Affiliation**

- **Secondary Nucleation**

- **Dissolution**

Hints and Tips

- **Additional Parameters**
  - Integrate agitation, temperature and pH data to see how parameters impact particles

- **Correct Location**
  - Avoid poorly mixed regions of the pipeline or vessel to ensure a representative measurement

- **Compare with Offline Methods**
  - Traditional particle size analyzers are designed for quality control. ParticleTrack is designed for process monitoring and optimization. Results can be compared but both are needed to deliver the best particles

- **Don’t Forget to Weight!**
  - To get the full particle story look at the unweighted and square weighted distributions

- **Correct Orientation**
  - Implementation of a ParticleTrack instrument (a) flush with wall of vessel or pipeline; (b) inserted tangentially to process flow; (c) inserted perpendicular to process flow at an elbow; and (d) inserted at optimal angle (45°) relative to process flow.

Contact Information

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