

Without measurement there is no control®

# Chem 20™ SM

## Chemical Particle Counter



### 20 nm particle detection for hazardous-area solvent monitoring

With 20 nm particle sensitivity and hazardous-area certifications, the Particle Measuring Systems Chem 20™ SM Chemical Particle Counter enables continuous inline monitoring of critical solvent chemistries used in advanced semiconductor manufacturing. Designed for solvents such as IPA and PGMEA, the Chem 20 SM eliminates the need for the complex, customer-built containment enclosures traditionally required for hazardous solvent monitoring.

Advanced particle detection technology, built-in safety features, and a compact inline design enable reliable contamination monitoring in hazardous environments. Continuous local and remote data access provides real-time visibility into particle levels while supporting global hazardous-area requirements.

Semiconductor manufacturers and chemical suppliers can detect contamination closer to the process, helping identify yield-limiting particle events before they impact production. By combining 20 nm particle detection with hazardous-area certification, the Chem 20 SM simplifies deployment while maintaining critical contamination control.

#### BENEFITS

- Designed and built to monitor solvents in hazardous environments
- Sample flow conditioners improve count data on high molecular scattering events
- Inline monitoring to identify yield limiting events
- Compact and cost effective, requiring less space for ease of installing and relocating
- React quickly to particle excursions long before surface scan or yield data are available
- Multiple safety features for peace of mind

#### FEATURES

- Certified for IECEx, ATEX, NFPA NEC 70 Cl1 Div2, KCs Ex, TS Ex
- Purged unit with smaller dimension than regular counter in secondary containment box solution
- Flow sensor and leak detector to shut off laser and flow
- Contained leakage with suitable drainage
- Built-in bubble separator and pressure regulator
- Optimized design for IPA and PGMEA. Can be tested for other solvents to find effectiveness
- 24/7 monitoring with data available through local display and remote data logger
- Built-in thermal electric cooler keeps internal environment stable
- Flexible communications systems support legacy data acquisition systems

#### APPLICATIONS

- Hazardous environments
- Real-time particle monitoring for solvent chemicals
- Point-of-process monitoring
- Chemical packaging operations monitoring
- Chemical filter performance and efficiency characterization
- Chemical QA and verification
- Performance testing of chemical handling components

# Chem 20™ SM Chemical Particle Counter

| PARAMETER                          | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                               |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|-------------------------------|
| Size Range                         | ≥ 20 nm PSL or 9 nm Au minimum detection limit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                             |                               |
| Channels                           | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |                               |
| Channel sizes                      | 20, 50, 70, 100 nm (standard)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 20, 30, 50, 70 nm (optional)                | 20, 30, 40, 100 nm (optional) |
| Flow Rate                          | 35 ml/minute ± 10%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                             |                               |
| Bubble Separation Flow             | <b>Nominal:</b> 20 ml/min, <b>Range:</b> 20-40 ml/min                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |                               |
| Maximum Concentration <sup>1</sup> | High Concentration Mode: 420,000 P/ml > 20 nm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                               |
| Temperature                        | <b>Sample:</b> 59 – 104 °F (15 – 40 °C)<br><b>Storage/Transport:</b> -20 – 50 °C (4 - 122 °F)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                               |
| Sample Pressure                    | 40 psi, minimum; 75 psi, maximum                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                               |
| Exterior surface material          | 304 Stainless Steel                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                             |                               |
| Wetted surface material            | <b>Before sample cell:</b> PFA, PTFE, Sapphire, Kel-F®, Kalrez® 4079; <b>After sample cell:</b> Borosilicate glass (Rotameters), stainless steel (Rotameters, Outlet Manifold Plug), ECTFE (Outlet Manifold)                                                                                                                                                                                                                                                                                                                                                                                                 |                                             |                               |
| External dimensions (d,w,h)        | 23.7 x 19.3 x 12.2 in (60.2 x 49.1 x 30.9 cm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                             |                               |
| Weight                             | 92 lbs (41.7 kg)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                               |
| Power                              | 100-120 VAC or 220-240 VAC, 50-60 Hz, <5A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                             |                               |
| Laser classification               | Class I complies with US21 CFR 1040.10 and EN60825-1.<br>Internally an enclosed Class IV laser is used per EN60825-1.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |                               |
| Communications                     | <b>Ethernet</b> (PMS protocol), <b>4-20 mA</b> (5 outputs: 4 size channels, 1 sensor status), <b>USB 2.0 Type B</b> (setup and diagnostics only)                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                             |                               |
| Status Indicator                   | LCD Display and 1 tri-color LED. Indicates operation and communications status, and laser, sample flow or internal-leak status. Additional purge controller display                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                             |                               |
| Calibration                        | Sensors calibrated using PSL particles in pure water. Materials used are traceable to NIST and/or JIS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                             |                               |
| Environment                        | Temperature: 64.4 – 84.2 °F (18 – 29 °C) ± 1 °C/hr; Humidity: 5 - 95%, Non-Condensing;<br>Sensor must be installed in an environment with the ability to reject <500W of heat. (requires 6 inches of clearance for external fan); Indoor use only; Isolated from excessive machinery or vehicle vibration (isolated from vibrations of >0.05g RMS); Pollution degree 2; Over-voltage Category II; Ordinary protection (not protected against harmful ingress of moisture) IP4x; Class I Equipment (Electrical earth ground from the mains power source to the product input is required for safety purposes) |                                             |                               |
| Compliance and Agency Approvals    | NFPA NEC 70 Cl1 Div2<br>Korea KCs Ex – In Progress                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | IECEX Zone 2<br>Taiwan CNS Ex – In Progress | ATEX Zone 2<br>CE Certified   |

<sup>1</sup> Less than 10% coincidence loss, measured at the maximum recommended concentration.

**NEED MORE INFORMATION?** Scan the QR code to connect with our team for guidance



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