

# Chem 20™

Chemical Particle Counter

*World's most sensitive particle sensor  
for high purity process chemicals*



*Without measurement there is no control*

Leading-edge microelectronic processes require very clean process chemicals that are highly filtered and regulated to a particle size of 20 nm or below. With 20 nm particle sensitivity, the new PMS Chem 20 Chemical Particle Counter is the world's most sensitive particle sensor for high purity process chemicals.

Extensive data on chemical distribution and packaging systems proves that the PMS Chem 20 sensor, with 20 nm sensitivity, detects larger concentrations of particles with better statistics than competitive products. The Chem 20 Chemical Particle Counter is a valuable tool that enables facility and process engineers to quickly detect and characterize chemical particle sources before they impact process and device performance.

## BENEFITS

- Detect 20 nm PSL and 9 nm Au particles in real time
- Detect yield-limiting particles (not possible with competitive technologies)
- Easy online and offline 20 nm testing
- React quickly to particle excursions long before surface scan or yield data are available
- Optimize chemical delivery systems from the loading dock to point-of-process
- Tighten process control limits through improved sample population statistics

## FEATURES

- Advanced laser optics and detectors enable detection of 20 nm polymer and 9 nm metallic particles in chemicals
- On-board chemical flow meter to set sample flow
- First particle counter optimized for low and high refractive index chemicals for improved performance:
  - Chem 20 sensor, for chemicals with lower indices of refraction
  - Chem 20-HI sensor, tailored for sulfuric acid and other higher-index chemicals
- On-board leak detection to provide alarm upon an internal chemical leak
- Low-flow detector and alarm to ensure consistent data
- Bubble detector to optimize data and protect sensor
- Syringe sampling with the SLS-20 syringe liquid sampler
- Two view modes optimize instrument operation for very dirty or very clean applications, extending product application space
- Local data display
- Flexible communications systems support legacy data acquisition systems

## APPLICATIONS

- Real-time particle monitoring within chemical distribution systems
- Point-of-process monitoring
- Chemical packaging operations monitoring
- Chemical filter performance and efficiency characterization
- Chemical QA and verification
- Performance testing of chemical handling components

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Specifications

Size range	≥ 20 nm PSL and 9 nm Au minimum detection limit	
Channels	4	
Channel sizes	20, 50, 70, 100 nm (standard) 20, 30, 50, 70 nm (optional)	
Flow rate (ml/min)	35 ml/min	
Zero count	< 100 counts per liter	
Maximum concentration <sup>1</sup>	<b>High Resolution Mode</b> 2500 P/ml ≥ 20 nm; 1000 P/ml ≥ 100 nm	<b>High Concentration Mode</b> 500,000 P/ml > 20 nm; 10,000 P/ml > 100 nm
Sample temperature	59 – 104 °F (15 – 40 °C)	
Maximum pressure	75 psi, max	
Wetted surface materials	PFA, PTFE, Sapphire, Kel-F®, Kalrez® 4079	
Exterior surface	316L stainless steel enclosure	
External Dimensions (l, w, h)	20.0 x 16.8 x 11.1 in (50.8 x 42.7 x 28.3 cm)	
Weight	64.5 lb (29.2 kg)	
Power	100 – 240 VAC	
Laser classification	Class I complies with US21 CFR 1040.10 and EN60825-1. Internally an enclosed Class IV laser is used per EN60825-1.	
Communications	Ethernet (PMS protocol), 4-20 mA (5 outputs: 4 size channels, 1 sensor status), RS-232 (set up and diagnostics only)	
Status indicator	LCD display and one (1) tri-color LED. Indicates operation and communication status, and laser, sample flow or internal-leak status	
Calibration	Sensors calibrated using PSL particles in pure water. Materials used are traceable to National Institute of Standards & Technology (NIST) and/or Japanese Industrial Standards (JIS).	
Environment	Temperature: 64 – 82 °F (18 – 28 °C) ± 1 °C/hr Humidity: 5 - 90%, Non-Condensing Sensor must be installed in a conditioned environment with stable temperature control. Indoor use only; Pollution degree 2 Isolated from excessive machinery or vehicle vibration Over-voltage (transients) Category II Ordinary protection (not protected against harmful ingress of moisture) Class I environment (Electrical earth ground from the mains power source to the product input is required for safety purposes)	

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

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