

REAL-TIME PROCESS PARTICLE COUNTER - PPC

INDUSTRY APPLICATIONS:

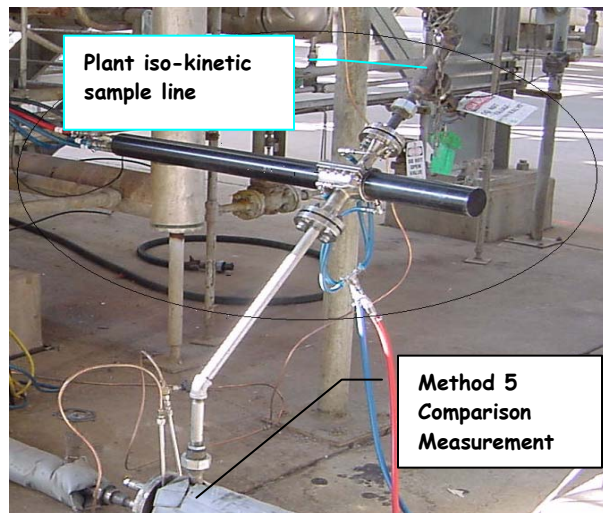
- **PARTICLE CONTAMINATION SENSOR FOR PROCESS OPTIMIZATION:**
 - Gas Turbines
 - Turbo-expanders
 - Filtration Efficiency measurements
 - Stack and Duct monitoring (CEMs)

- **INDUSTRIES:** Petroleum refineries, Gas Turbines, Gas Distribution Systems, Cement, Steel, Foundry, Aluminum, Boilers, Powder Production/collection, Pulp and Paper, Powder milling and Processing, Laboratory and Field Research, Filter Testing, and more.

PERFORMANCE:

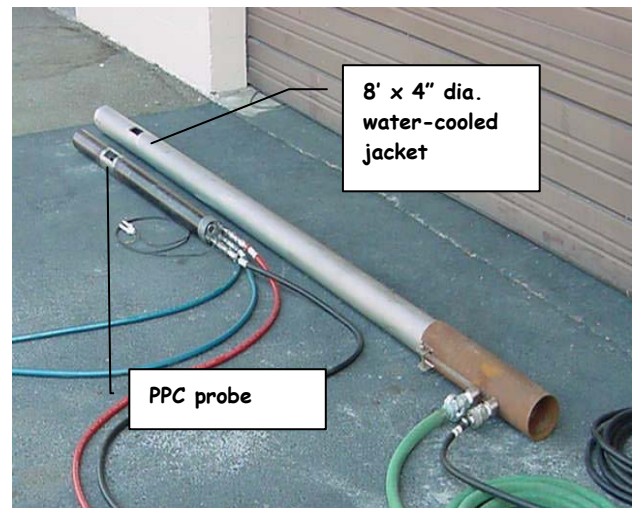
- **SIZE DISTRIBUTION** (0.25 - 100 microns, optical diffraction, factory calibrated)
- **CONCENTRATION** (10 $\mu\text{g}/\text{m}^3$ - 2 g/m^3 , PM2.5, PM10, total particulate mass)
- **VELOCITY** (0.2 - 100 m/s, mass emissions rates)
- **ALL PARTICLE MATERIALS** (Solid, liquid, non-spherical or spherical)
- **AMBIENT OR HIGH Temperature/Pressure** (up to 2500F, 80 bar)
- **EXTRACTIVE OR IN SITU SAMPLING** for continuous process monitoring
- **RAPID (1 - 10 SECOND)** continuous updates with linkage to process control
- **REMOTE UNATTENDED OPERATION** (eductor-extraction mode)

EXTRACTIVE SAMPLING



PPC extraction probe (in line with Method 5 sampler) for measurements of catalyst in petroleum refinery. Data obtained at entrance and exit of cyclone separator at 1200F, 3 bar. Extraction method with throttling control shown.

IN SITU



Layout of water jacket and PPC probe for *in situ* high temperature applications. PPC probe (3" dia.) is inserted into 4" dia. water jacket and lined up with 1.3" x 2" open slot. Maximum insertion distance is 2 meters for 8' long water-cooled jacket.

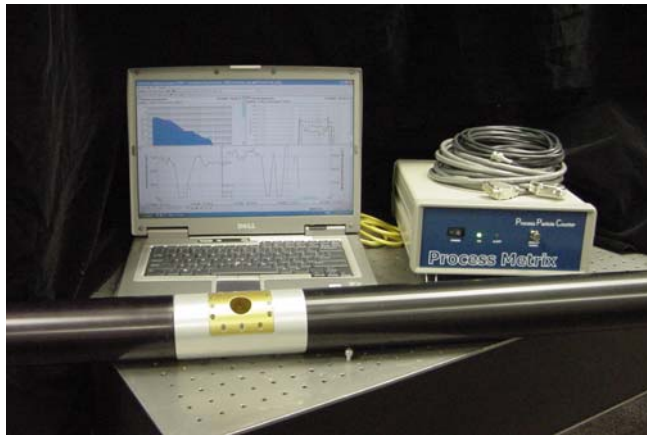
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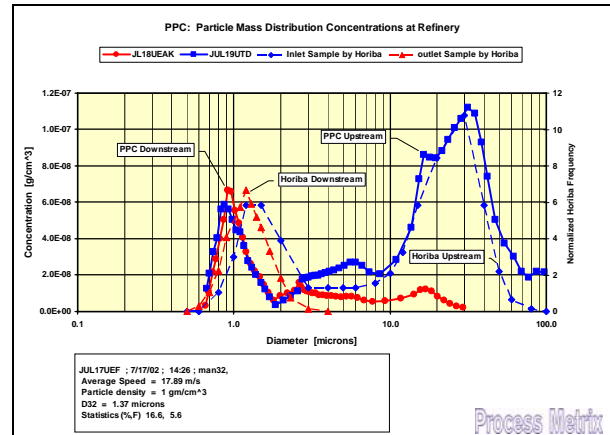
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ACCURATE REAL-TIME SIZE, VELOCITY, AND MASS CONCENTRATION MEASUREMENTS:

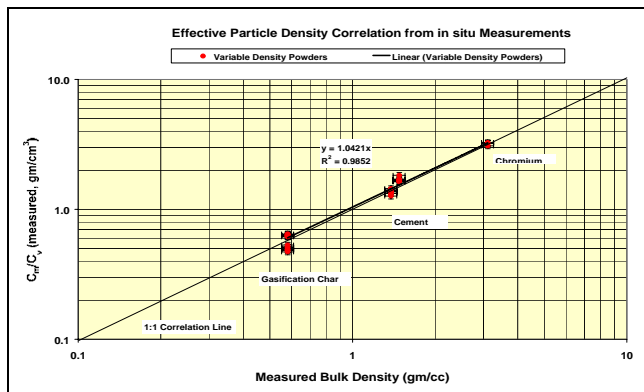


Process Particle Counter (PPC) standard system, including:
 1) PPC probe with standard flow window configuration (center section);
 2) Laptop computer for data collection and processing;
 3) Ethernet cable (max. length 300 ft.);
 4) PPC probe signal and power cables (max. length 20 ft.);
 5) Signal Processor enclosure.

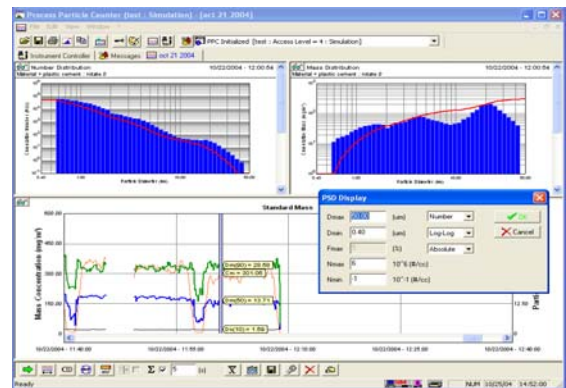


PPC particle size distribution measurements (frequency and cumulative) at entrance (Blue) and exit (Red) of cyclone separator at petroleum refinery. Comparison measurements (Horiba, ensemble diffraction) of collected samples at the cyclone separator inlet (Blue-dashed) and outlet (Red-dashed).

MASS BALANCE VERIFICATION AND PARTICLE SIZE ACCURACIES:



Effective density (known mass concentration, C_m , ratioed by PPC measurement of volume concentration, C_v), compared to measured particle bulk density. Results confirm that the bulk particle density is the effective optical particle scattering density. Mass balance measurements for each instrument are performed in our dust laboratory prior to delivery, and agree within 10% of known dust concentrations.



Distribution and time history display, showing typical pop-up window for selection of scaling parameters. Top graphs show detailed frequency and cumulative distributions (number at left and mass at right) at any time. Six different views (e.g. velocity distribution, etc.) can be selected for each graph. Time history allows selection of six views with 6 distribution parameters each (from choice of 30). Averaging and many other data management functions are included in the software package.

MORE INFORMATION:

You can find further detailed references, application notes, and company background on our website or you can e-mail or call Process Metrix. Consulting services are also available.

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