

Inline Particle Measurement

Valuable insight in
your process



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A SOPAT brand

Our offer

Almost three quarters of all substances processed in the chemical, the pharmaceutical, or the food industry are present as powders, in granular form or as solids. In many processing steps, the particle size distribution is therefore the most important characteristic of these materials.

While conventional laboratory analysis aims to determine particle size to obtain information about the quality of the final or intermediate products, inline particle measurement provides information about the manufacturing process that is often crucial. Based on this information, you will be able to:

- better understand your processes and make them more efficient,
- use your resources more economically and reduce your process times,
- identify defects quickly and respond accordingly,
- minimize your risks and increase your safety,
- apply more accurate specifications and increase the utilization rate of your equipment,
- improve the reproducibility and the consistency from batch to batch, and
- speed up your developments and reduce your upscaling times.

Get to know our measuring probes and learn from our process engineering specialists what inline particle measurement can contribute to your production processes. We bring our experience from 20 years of process measurement technology and from more than 400 measurement systems installed globally.



Each process is unique, that is why field trial is indispensable.

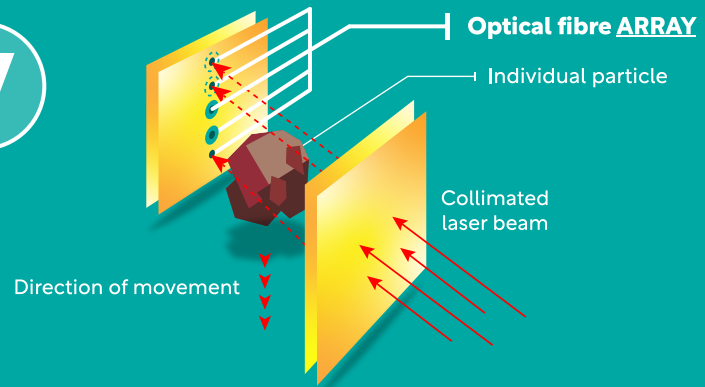
Flexible testing options

From a one-day test to an entire test week to renting equipment for tests lasting several weeks, as well as support from one of our specialists will help you make the right purchase decision. Just tell us what you need.

Parsum measurement principle

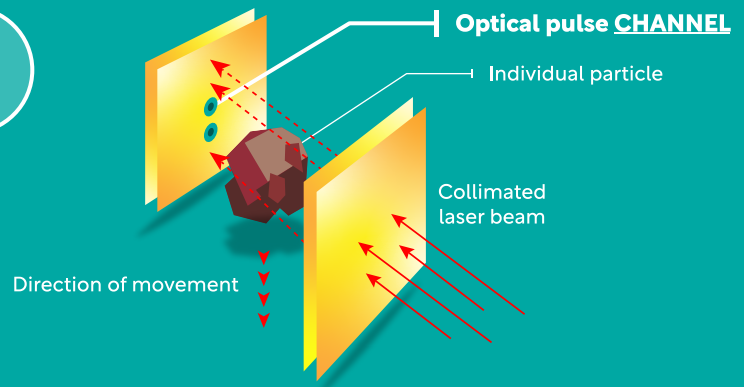
1st STEP

Measurement of the individual particle velocity



2nd STEP

Measurement of the time of flight to pass a fiber



Particle size calculation



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Dimension of the particle in moving direction (cord length)

Individual velocity

Time of flight to pass a fiber

Our probes

IPP 70-S

This universal inline particle probe is designed for direct use in dense particle streams, in fluidized beds or similar processes. The IPP 70 is self-monitoring during measurement. LEDs on site or signals to the process control system allow the user to monitor the safe operation of all important components at any time.



Technical details

Particle size measurement range	50...6000 µm
Particle velocity measurement range	0.01...50 m/s
Measuring rate	Up to several thousand particles per second
Products	Powder, pellets, granulates, sprays...
Process temperature/pressure	-20°C to +100°C / <4bar
Material, in contact with product	Stainless steel (316L), sapphire, epoxy resin
Probe tube dimensions (length x diameter)	280 x 25 mm
Electronics - housing dimensions (w/h/d)	120 x 90 x 60 mm
Electronics - housing temperature	- 10°C to 60°C
Housing protection class	IP65
Light source	Laser (laser class 1)
Interfaces	OPC-Server, TCP/IP-Server, 4...20 mA

Our probes

IPP 70-SE

This ATEX certified and intrinsically safe probe is designed to provide reliable particle measurements in explosive atmospheres. Direct measurements can be made in zones 0 and 20.



Technical details



Particle size measurement range	50...6000 µm
Particle velocity measurement range	0.01...50 m/s
Measuring rate	Up to several thousand particles per second
Products	Powder, pellets, granulates, sprays...
Process temperature/pressure	-20°C to +100°C / <4bar
Material, in contact with product	Stainless steel (316L), sapphire, epoxy resin
Probe tube dimensions (length x diameter)	280 x 25 mm
Electronics - housing dimensions (w/h/d)	120 x 90 x 60 mm
Electronics - housing temperature	- 10°C to 60°C
Housing protection class	IP65
Light source	Laser (laser class 1)
Interfaces	OPC-Server, TCP/IP-Server, 4...20 mA
ATEX certificate	IBExU02ATEX1009
Marking of the probe IPP70-Se	II 1/2G Ex ia op is IIB T4 Ga/Gb II 1/2D Ex ia op is IIIC T125°C Da/Db
Marking of the barrier box IPP70-Se-B	II (1)G [Ex ia Ga] IIB II (1)D [Ex ia Da] IIIC

Our probes

IPP 75-S

Thanks to its individual length from 38 cm up to more than 1 m, this probe is ideally **suited for large process vessels or customized solutions.**



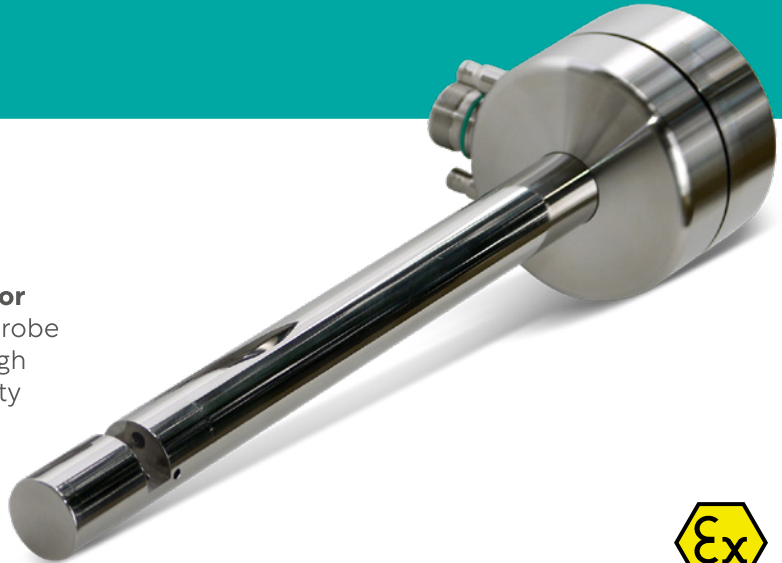
Technical details

Particle size measurement range	50...6000 µm
Particle velocity measurement range	0.01...50 m/s
Measuring rate	Up to several thousand particles per second
Products	Powder, pellets, granulates, sprays...
Process temperature/pressure	-20°C to +100°C / <4bar
Material, in contact with product	Stainless steel (316L), sapphire, epoxy resin
Probe tube dimensions (length x diameter)	380 x 25 mm (longer version options possible)
Electronics - housing dimensions (w/h/d)	130 x 120 x 65 mm
Electronics - housing temperature	- 10°C to 60°C
Housing protection class	IP65
Light source	Laser (laser class 1)
Interfaces	OPC-Server, TCP/IP-Server, 4...20 mA

Our probes

IPP 80-P

This probe was developed for measuring the particle size distribution of powders, pellets or granules in pharmaceutical processes. This probe is a valuable PAT tool wherever particularly high demands are made on cleanliness, cleanability or hygiene, whether in conventional batch operation or in continuous production. ATEX certified for zone 0/20.



Technical details



Particle size measurement range	50...6000 µm
Particle velocity measurement range	0.01...50 m/s
Measuring rate	Up to several thousand particles per second
Products	Powder, pellets, granulates, ...
Process temperature/pressure	-20°C to +100°C / <4bar
Material, in contact with product	Stainless steel (316L), sapphire, epoxy resin
Probe tube dimensions (length x diameter)	280 x 25 mm (optionally 380 x 25 mm)
Electronics - housing dimensions (diameter x depth)	90 x 60 mm
Electronics - housing temperature	-10°C to 60°C
Housing protection class	IP65
Light source	Laser (laser class 1)
Interfaces	OPC-Server, TCP/IP-Server, 4...20 mA
ATEX certificate	IBExU14ATEX1247
Marking of the Probe IPP70-Se	II 1/2G Ex ia op is IIB T4 Ga/Gb II 1/2D Ex ia op is IIIC T125°C Da/Db
Marking of the Barrier-box IPP70-Se-B	II (1)G [Ex ia Ga] IIB II (1)D [Ex ia Da] IIIC

Process interface

A wide range of accessories for process adaptation, such as inline dispersers or rinsing cells used as process interfaces, facilitate adaptation to a wide range of conditions.

Particle measurement without dispersion is difficult to imagine in most cases. This is one of the reasons why traditional particle measurement laboratories have a wide range of accessories for separating powders, grains and granules – an important prerequisite for reliable analysis. Even for the classic type of sieving, mechanical dispersion is often necessary. For the continuous measurement of particles within a process without sampling, only inline dispersion can lead to a robust measurement.

It is the ability to disperse the particle stream in the process vessel that distinguishes the Parsum probes from other inline measurement systems. Only inline dispersion makes it possible to reliably determine particle size in wet or sticky materials in a manner comparable to laboratory methods.



Accessories

D24 inline disperser	For high load/high fine content – particles up to 2000 µm, clearance 3.8 mm
D12 inline disperser	As for D24, but also for particles >2000 µm, clearance 7.5 mm
SZ11, SZ20 - cleaning cells (assuming a low particle load)	To keep the probe optics free of contamination without active dilution of the particle flow
Compressed air unit	Compressed air supply for the probe when using dispersers or cleaning cells
VS28 anti-wear guard	Tube sleeve with a reinforced hard-chrome coating with a hardness of 68 – 72 Rockwell

Software

The Parsum measurement software is a flexible system composed of programs and interfaces.

IPP - This is the actual measuring program which is the core of the software. It is used to control the measurement and to clearly display the results.

Analog Output - Current loop interface (4 to 20 mA) with 8 or 16 channels for the transmission of measured values to distributed control systems.

ParsumView - Specially developed for use in the pharmaceutical industry or for applications with increased safety requirements (meets the requirements of 21 CFR 11).

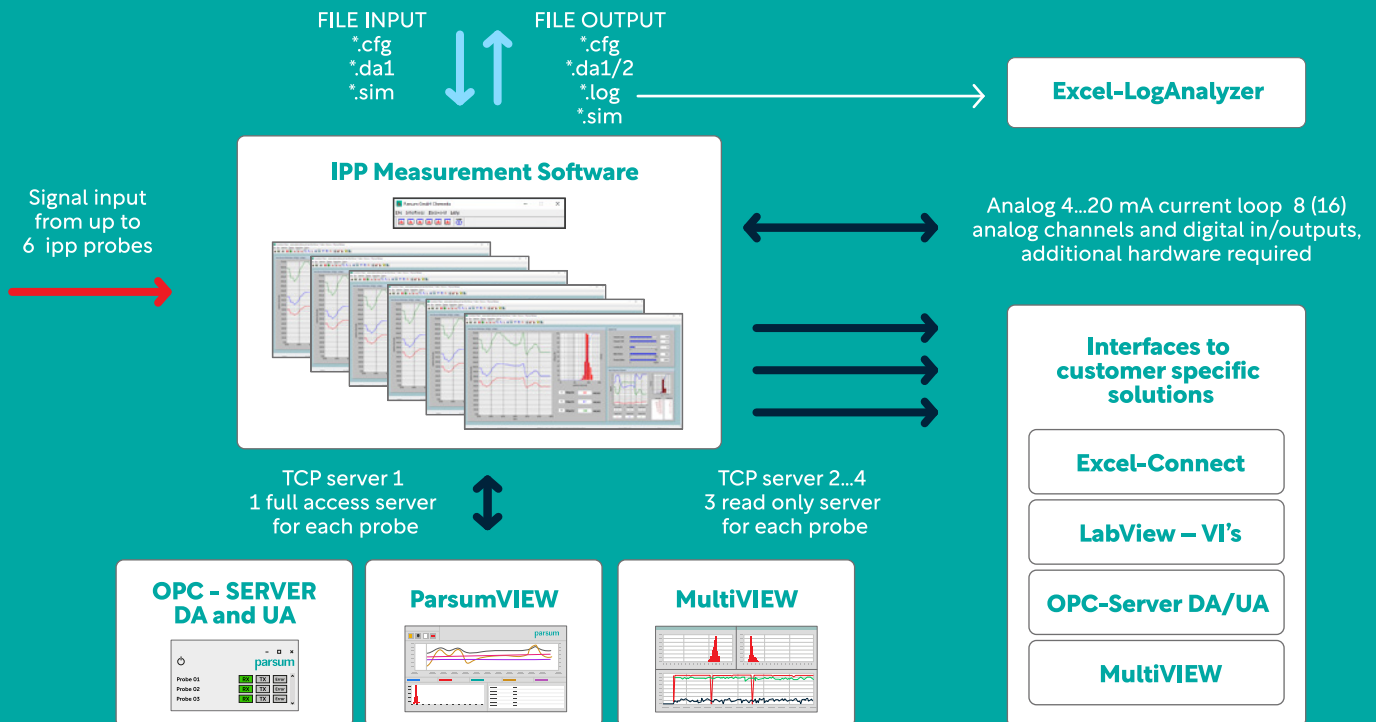
OPC-Server - Enables data transmission and remote control of up to 24 Parsum probes via standard OPC-DA 3.0. and OPC-UA protocol.

LabView-VIs - For integration of the Parsum probes into your own LabView programs.

LogAnalyzer - Macro for fast analysis, evaluation and graphical display of measured value curves in Excel.

ExcelConnect - For online integration of Parsum measurement results into your own dynamic Excel charts.

MultiView - To display the measurement results from multiple probes in a network.



Application examples

- **Pharmaceutical pellet coating:** continuous determination of layer thickness and agglomerate content in fluidized beds.
- **Production of cellulose fibers:** Identification of single large particles for the detection of screen breaks in mills.
- **High-shear granulation and pelletizing:** end-point determination.
- **Fluidized bed granulation:** Monitoring to guarantee batch-to-batch consistency.
- **Fluidized bed process optimization:** Integration into PAT systems for development.
- **Continuous washing powder granulation:** inline particle size measurement as an assistance system to reduce the hold-up volume in the grinding/screening circuit.
- **Roller mills:** monitoring wear and the particle size when grinding coffee, plastics, silicon, or similar materials to adjust the grinding gap.
- **Three-deck screening machine:** measurement of particle size to control the amount of added mineral materials to avoid overflow or spillage.
- **Fluidized bed drying:** monitoring particle size to control material feed and fluid bed height.
- **Silo discharge:** monitoring segregation and contamination.

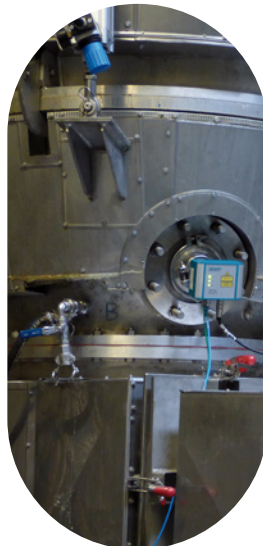
Granulation



Coating



Drying



Crushing



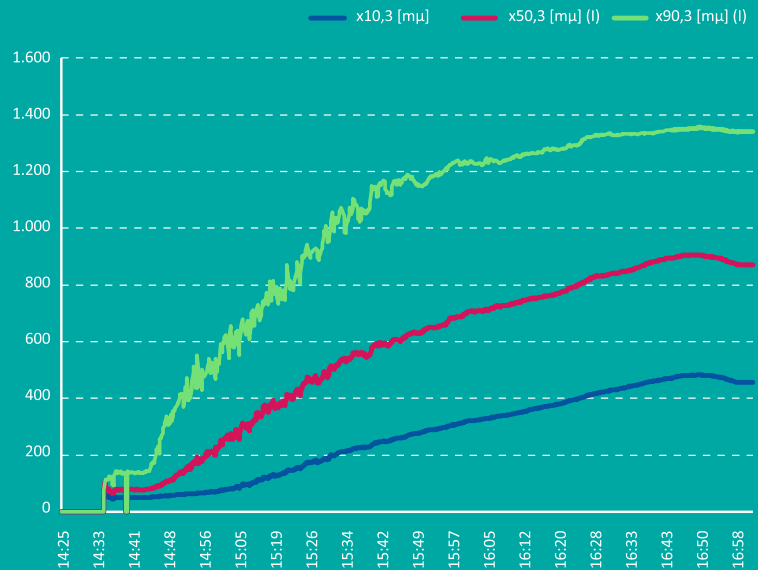
Mixing
Fractionation
Transport



Applications

FLUID BED BATCH GRANULATION

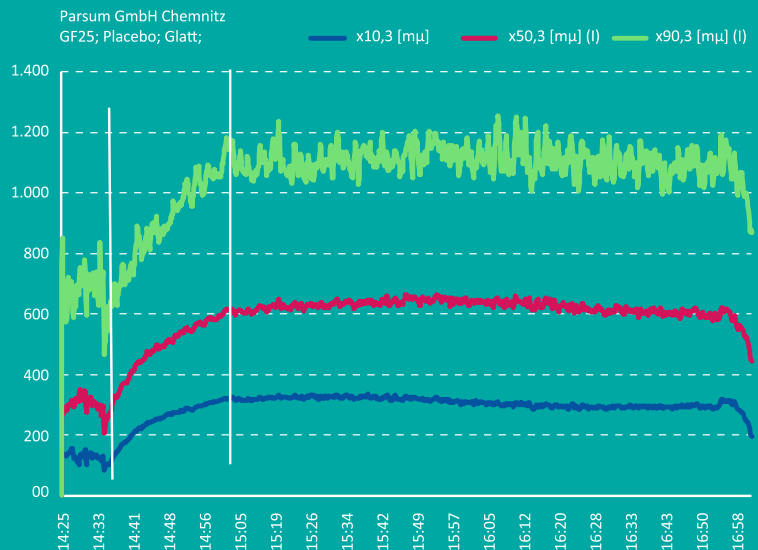
Monitoring granule growth allows operators to better understand the processes. It helps to make them more efficient and optimize parameters. Fewer tests and laboratory analyses during upscaling means that development time is reduced.



FLUID BED CONTINUOUS AGGLOMERATION

The in-line particle measurement with the Parsum probe provides certainty about the process flow in production and helps to recognise any deviations at an early stage and to document the process flow in a traceable manner. The start-up phase can be shortened and the ongoing process can be kept stable thanks to the constantly updated knowledge of the particle size.

Continuous measurement also provides important findings for the development and optimisation of control strategies for continuous pharmaceutical production processes.



R & D

An Essential Part of Our Company's Philosophy

Parsum has been at the forefront of providing comprehensive solutions for real-time particle size measurement in continuous processes. Established in 1997 by former Chemnitz University of Technology professionals, Parsum has evolved into a globally recognized supplier of Process Analytical Technology (PAT) solutions tailored for the chemical and pharmaceutical sectors.

The enduring success of Parsum's Probe design, featuring no mechanically adjustable parts, has enabled seamless integration into existing systems. Beyond fine chemicals, food, and basic industries, our IPP 70-probe type offers a Good Manufacturing Practice (GMP)-compliant solution for the pharmaceutical sector.

In a significant development in the summer of 2022, SOPAT acquired Parsum, combining their strengths to further enhance their capabilities in the realm of particle size measurement. This strategic move aligns seamlessly with our commitment to innovation and excellence.

With a focus on innovation, Parsum leads in fluidized bed processes, using unique Inline dispersing technology for accurate particle size distribution. Aligned with "Industry 4.0" trends, the SOPAT and Parsum collaboration positions them for continued success.

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Globally Active Thanks to a Strong Sales Network

- **SOPAT** Head Office, Berlin
- **PARSUM** Head Office, Chemnitz

