25 years experience in application and service
Particle measurement in real time

In process + In line + In situ + In realtime + On line

We like to introduce to you a small selection of applications with inline particle technology in different application areas with 3D ORM-sensors since 1989 .

Product series of sensors for in situ particle measurement

The sensor size was minimized about 2/3 in the time of development for R &D lab application like bio fermentation!

MTS Sensors are working fromin the lab, pilot plant and in the production process in all scal up and down requirements

Optional Measuring ranges	> 0,5 up to 2000 µm
Optional Temperature ranges	minus 40°C up to 165 °C
Pressure:	Vacuum up to 1000 bar

Operating hours of the sensor from 50.000 hours – this reality of MTS quality.
Maintenance savings of 48.000 $ and more

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Working in high concentrated mediums in real time allows measurements in original products. MTS-sensor helps to observe and formulate new formulas.

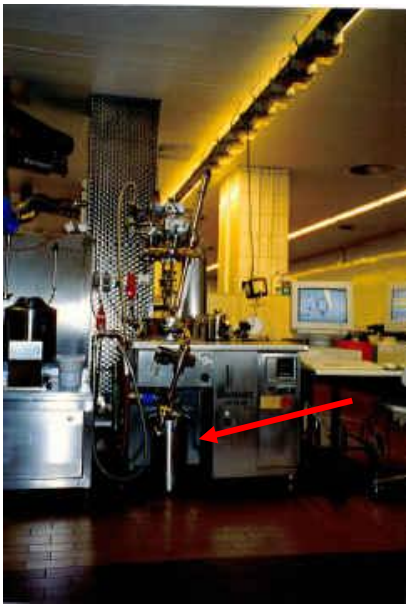

Fig. 1 Production of emulsion in homogenizer

Fig. 2 ParticleScan 2000 - 2008

Fig. 3 Fitting of the sensor in an homogenizer for continuous measurement

Fig 4 ParticleScan in a lab configuration until 2006

Fig 5 3D ORM Sensor – measurement of steel particles against water flow

Fig 6 The sensor is situated in water stream and fluid steel goes in opposite direction

Fig 7 At the meeting point of steel and water, the sensor measures particle size in the origin and controlled by changing of volume streams of steel and water

Fig. 8 Measurement of dry powders in the range of 2 – 500 µm in a riser with expedited speed of 30m/s

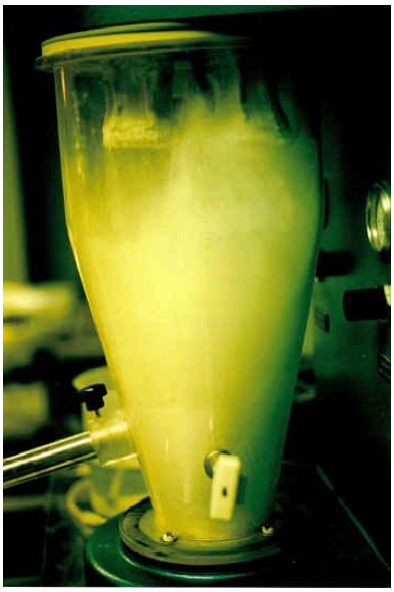

Fig. 9 Sensor in a fluidizer bed

Fig. 10 Measuring range from <10 to 500 µm

Fig. 11 Sensor in a fluidized bed

Fig. 12 Fitting in a reactor - 55.000 working hours without trouble

Fig. 13 Particles size measurement in an extruder with 300 bar

Fig. 14 Sensor fitted in a barrel for product checking

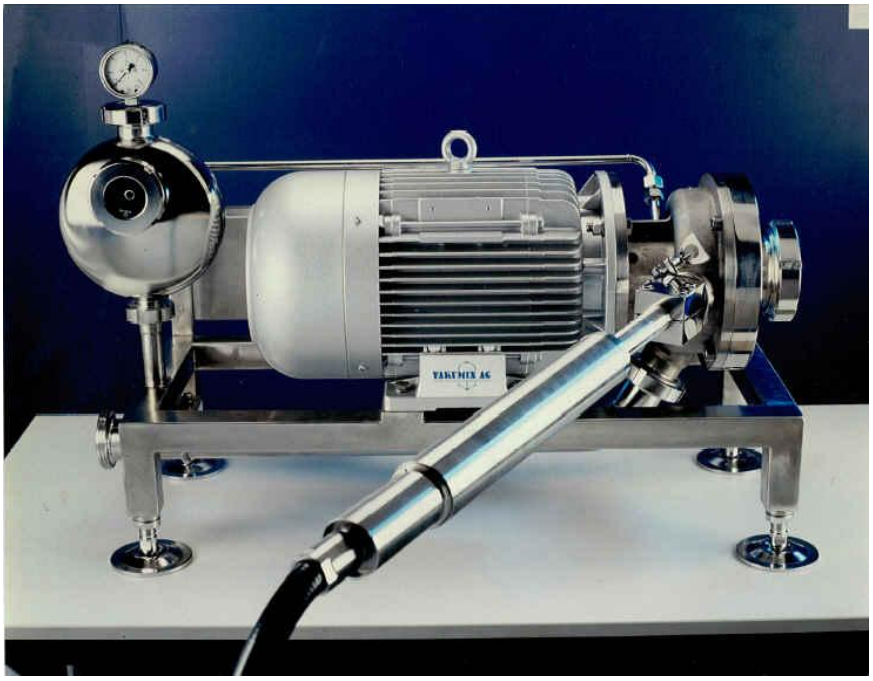

Fig. 15 Sensor in a Vakumix-Homogeniser

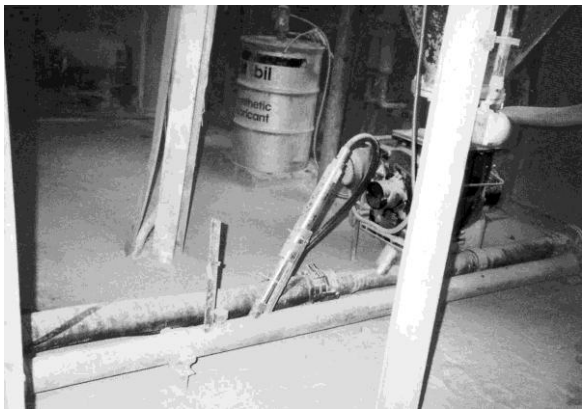

Fig. 16 Controlling in a mill – dry powder at 140°C and 3 bar with particle speed of 25 m/s for more than 12 years at Südchemie Duisburg Germany

Fig. 17 Evaluation device for process control

Fig. 18 Optimization at crystallization of sugar pan

Fig. 19 riser for light weight concrete

Fig. 20 Mill controlling with inline particle measurement

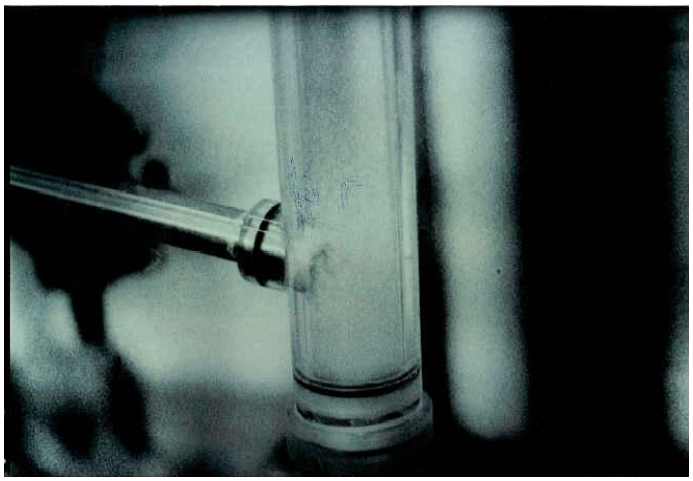

Fig. 21 Sensor in a fluidized bed for crystallization trials

Fig. 22 Particle measurement of cement in a riser; range: >1 -30 µm

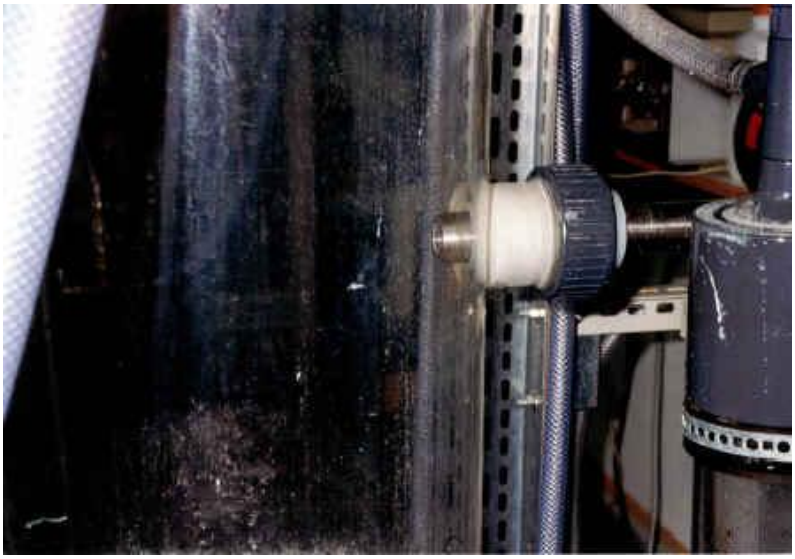

Fig. 23 Fitting in a bubble column reactor range: 2 - 1000 µm

Fig. 24 3D ORM Sensor in a bubble column reactor

Fig. 25 Measurement of bubbles; range: 10 -1000 µm with a special 2D ORM System Electronic

Fig. 26 Size measurement of special emulsion with 70% oil

Fig. 27 In situ controlling in a high pressure homogenizer at 1000 bar

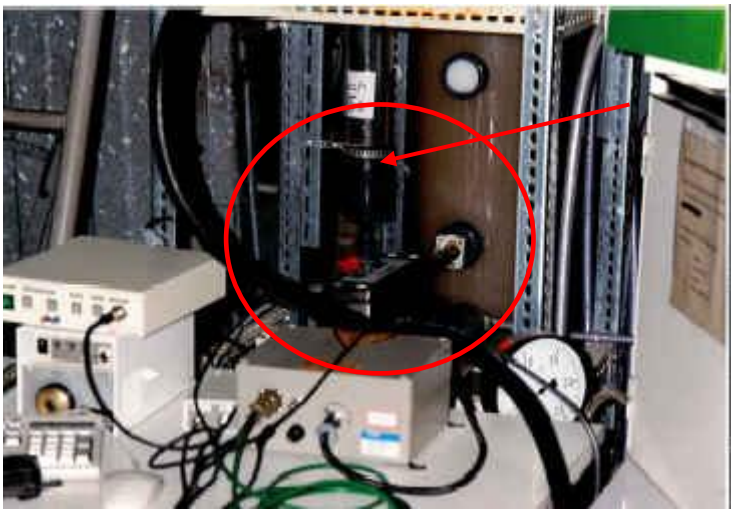

Fig. 28 In situ image analysis with PIA-sensor to analyze shape and size of flocks in a bubble reactor

Fig. 29 Silica slurry in a classifier

Fig. 30 In Process in situ measurement in a fluidsed bed

Fig.29 Sensor with homogenizer for cosmetic industry

Fig.31 fine chemicals slurry, range: 0,5 to 125 µm at 150°C

Fig. 32 Sensor fitting in a reaction cell; pressure:200 bar and 160°C; range: 2 to 2000 µm

Fig.33 Controlling of silo in a pneumatic riser. If particle size is differing from the norm it will be switch to the reserve silo automatically. Range: 0,5 – 60 µm

Fig.34 Measuring of particle size and ultra sound

Fig. 35 Particle measurement in a mini plant granulator

Fig. 36 Measurement of milk and yogurt –trial in the Hohenheim application centre

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Long term experience and competence – this is what I stand for

Friedel H. Schwartz

Messtechnik Schwartz GmbH

MTS at POWTECH