

Clamp-on Type Ultrasonic Density Meter

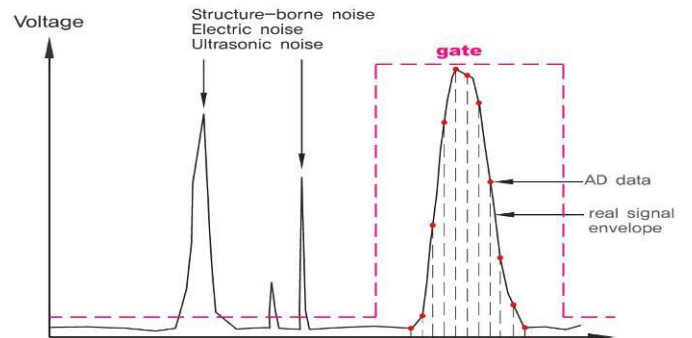


The Clamp-on density measurement guarantees fit-and-forget and reliable measurement with almost no influence on measuring medium. Different from other density meters, its measurement isn't affected by pressure, corrosiveness, nor abrasiveness. As the clamp-on sensor can be mounted outside of pipe line even under flow-running condition, the user neither need to stop their process nor to consider the corrosiveness of liquid.

Measuring Algorithm

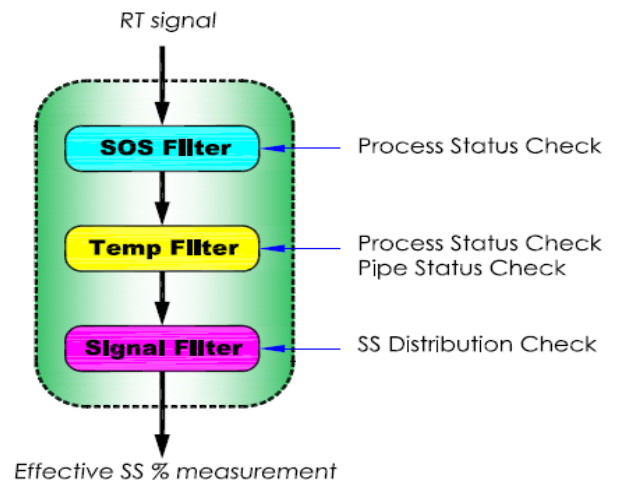
EEAM

Conventional ultrasonic attenuation density meter just determines density with amplitude of received signals. Unlike this, ENV200 is able to measure changes of concentration in a more sophisticated manner by adopting the patented EEAM (envelope energy averaging method), which measures not only the amplitude of received signals but also observes the shape of signal. It takes all energy as envelope and then convert it into density

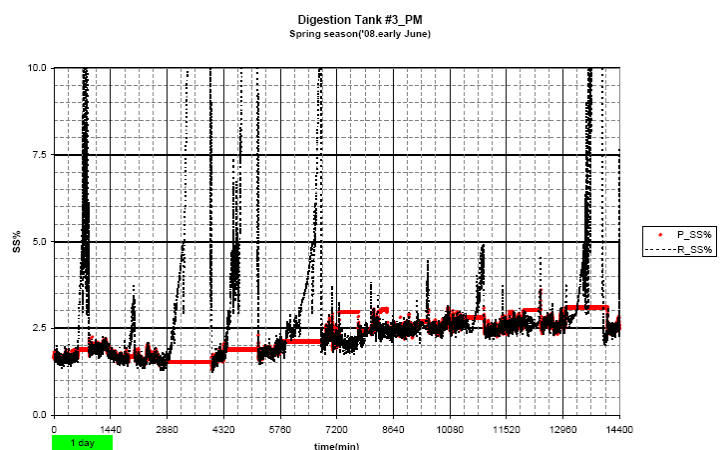


PCM(Process Condition Monitoring)

PCM algorithm consists of SOS filter that measures sound velocity of measuring fluid (S.S. mixed water); temp filter that measures temperature; and signal filter that monitors quality of received signals. Operational status (process run/stop, pipe full/empty) is determined by the combination of SOS filter and Temp filter. Signal filter helps to decide the valid S.S. distribution.



Since the PCM algorithm assimilates many measurements identifying changes of process condition (water status in pipe, and S.S. distribution pattern), its intelligence is designed to measure only valid S.S. concentration. Consequently, the performance is much more reliable and accurate, compare to conventional measurement



PCM(Red) VS Conventional algorithm(Black)

Product Features

Continuous measurement No Space and Tool



No maintenance

- No sensor cleaning is required for sludge adhesion on sensor surface.
- No sensor replacement is required for wear and tear by flowing medium.



No additional cost

- No additional pipe line is required for sensor cleaning
- No by-pass line is required for maintenance



No limit on measuring medium

- Can apply to almost all types of sludge regardless of abrasion, adhesion, and corrosion.
- Broad application
 - Desulfurization process at power plant
 - Corrosive liquids of chemical plant
 - Wastewater plant of ready-mixed concrete or mining sector

Comparison table with other technologies

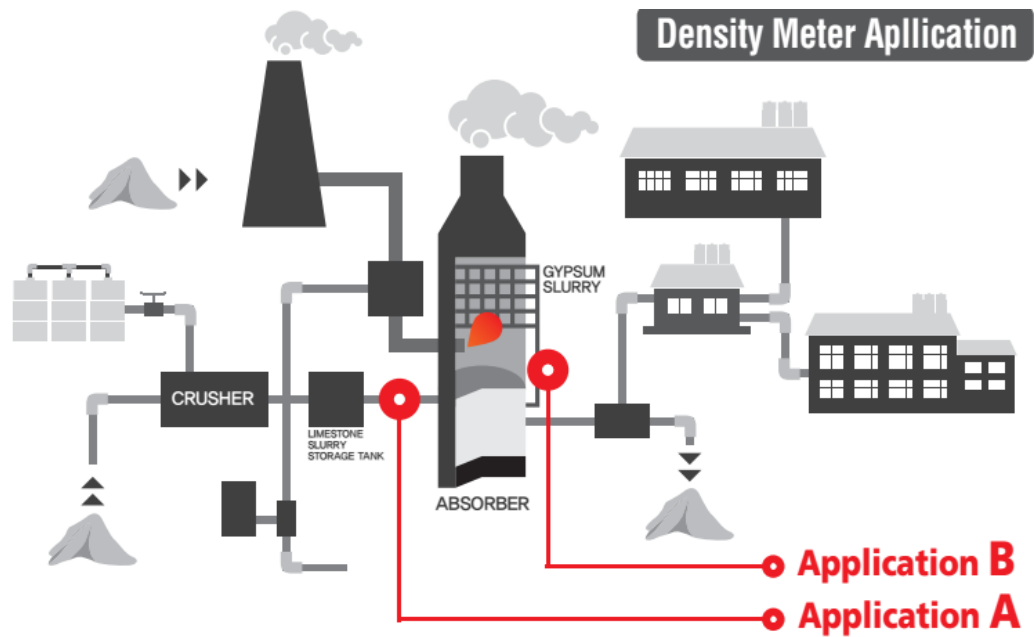
Specification	WESS	Conventional Ultrasonic	Microwave	Coriolis Flow Meter
Measuring Principle	Ultrasonic Attenuation with PCM & EEAM	Ultrasonic Attenuation	Microwave's phase difference	Coriolis
Measuring Range	0~1,000,000 mg/l(ppm), 1~1.5g/cm ³	0~80,000 mg/l(ppm)	0~500,000 mg/l(ppm)	0~3g/cm ³
Measuring Temp.	-20~70°C	-40~70°C	0~50°C(STD), -20~50°C(Option)	-50~200°C
Sensor Installation	Pipe's outside	Inside	Inside	Inside
Air bubble slurry	O(with PCM)	X	X	Δ
Electrolytes slurry	O	O	X	O
Abrasive Slurry	O	X	X	X
Corrosive Slurry	O		X	X
Sensor replacement	Rare	3 months	6 months	3 ~ 6 months

O : Excellent Δ : Okay X : Bad

Power Plant Application

The limestone and gypsum slurry density meter can be applied before and after desulfurization process. The density meter of **Application A** is installed to monitor the density pumping from a mill slurry tank.

The density meter of **Application B** is installed to check the efficiency of desulfurization process and to optimize the absorber's water level.



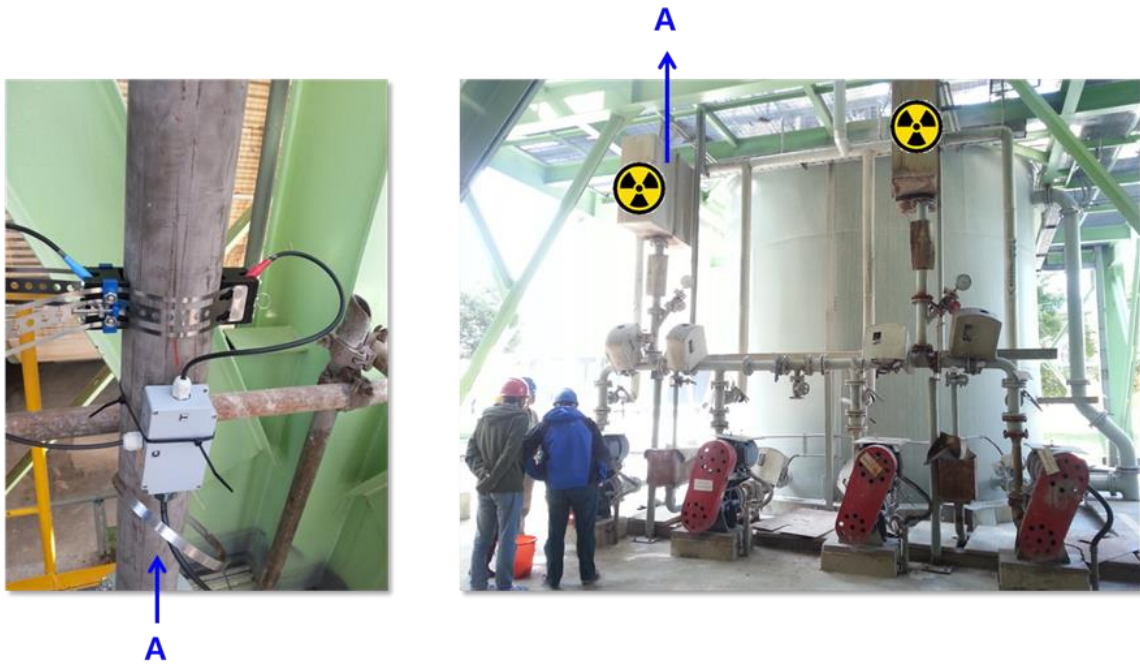
Application B



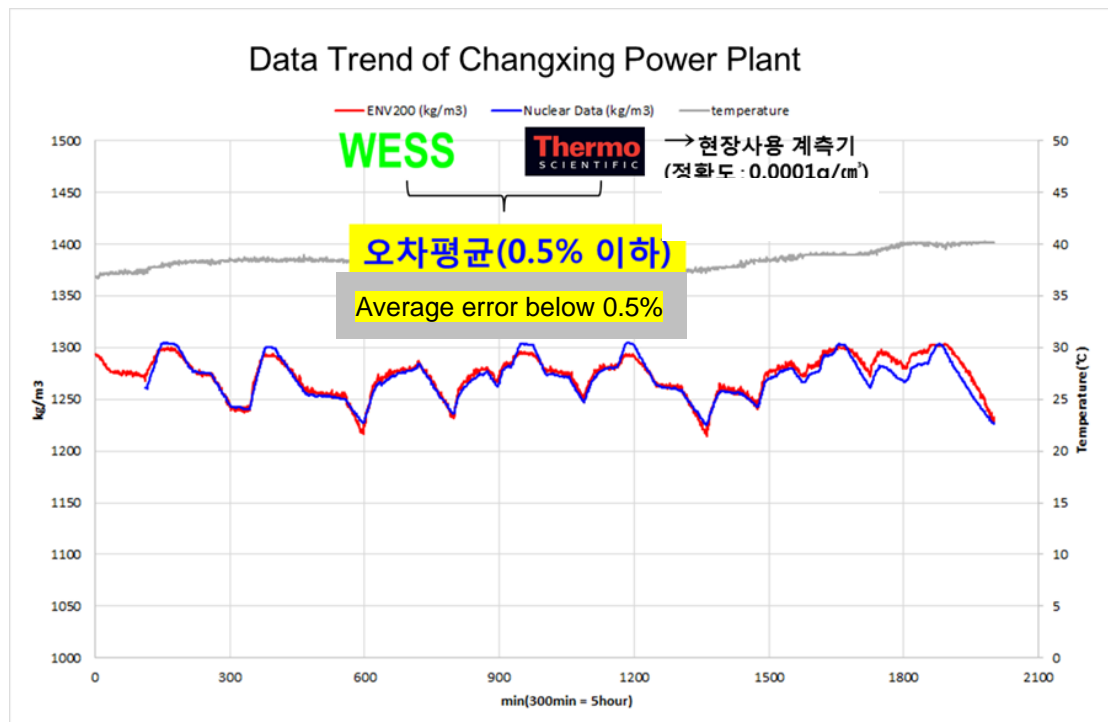
Application A

ENV200C Series

To make an effectiveness verification of Clamp-on density meter measurement, do a compare test between **Gamma-ray density meter** and **Clamp-on density meter** in Zhejiang power plant located in China.

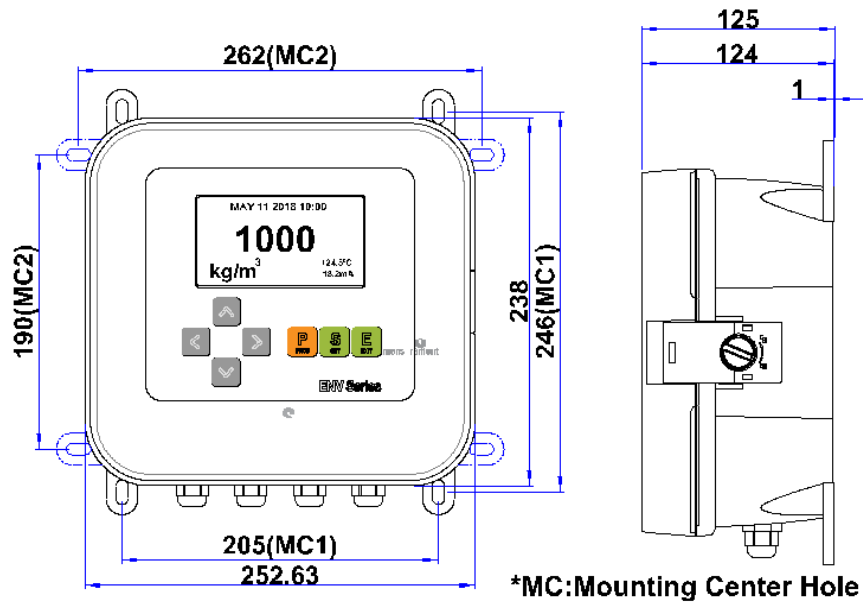


In conclusion, WESS **clamp-on density meter** got a very successful result as an average error was below 0.5% between them.

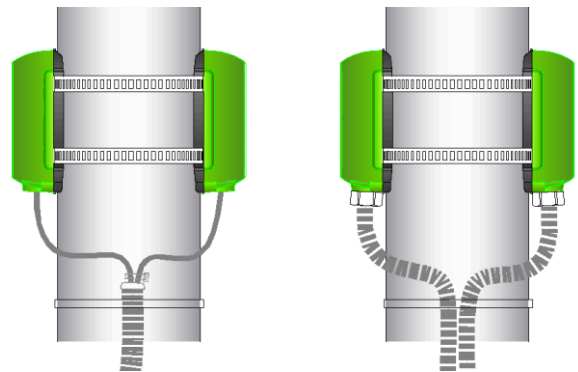
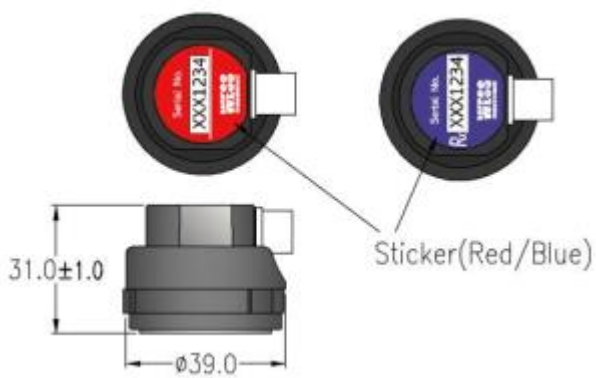


Product Dimensions

Controller – C2S2



Sensor – S2C



*Red: Transmission sensor

*Blue: Reception sensor

Product Specifications**Controller** **C2S2**

Measuring Principle	Ultrasonic Attenuation and EEAM(Envelope Energy Average Method)
Measuring Ranges	0 ~ 2,500 kg/cm ³ (0.000 ~ 2.500 g/cm)
Measuring Mode	Base mode
Display	Density, Time, Pipe condition, Echo profile, mA , etc.
Resolution	1kg/m ³ (0.001g/cm)
Accuracy	± 1% of full scale
Repeatability	0.001g/cm ³ (1kg/m ³)
Operational Temp.	-20 ~ 70°C
Data Saving	Maximum 400 days Data logging & Trend
Screen	Numeric, Parameter, Date Trend, Echo, Diagnosis
Outputs	Current Output : 4~20mA, nom. Load 250Ω (load range : 100 ~ 750Ω) Relay Output : 3 SPDT(5A, 250VAC) – “ER” “R1” “R2” Digital Output : RS232C(Standard) or RS485(Option)
Power Supply	Standard : 100 ~ 240V AC, 50~60Hz, ≤6W Option1) 10 ~ 14V DC, Option2) 22 ~ 26V DC
Encl. Material	Body/Cover: ABS
Dimension	260(W) x 258(H) x 131(D)mm
Mounting	Center hole 152(W) x 236(H)(Φ 8 x 4ea)
Weight	2.2 kg
IP Rating	IP67
Certificate	CE

Sensor	S2C
Sensor Type	CLAMP-ON
Material	Body : Polycarbonate Ultrasonic Head : Epoxy Sensor holder : Polycarbonate
Pipe Size	50A ~ 300A
Pipe Material	Stainless Steel, Plastic, Carbon Steel, etc.
Pressure	Max. 145psig (10bar)
Frequency	0.83MHz ~ 1.5MHz (Automatic frequency selection)
Operational Temp.	-10 ~ 70°C
Dimensions	Sensor: Ø39 x H31mm Sensor Holder: W63 x L135.5 x H49mm
Weight	Sensor: 36g Sensor Holder: 150g
Cable Length	10m
IP Rating	IP68

Ordering Code

ENV200 Ultrasonic Sludge Density Meter

ENV200	CODE	Description
Controller	C2S1	ENV200 Controller for spool-piece, tank-mount, AC 100~240V (Standard)
	C2S2	ENV200 Controller for S2C - AC 100~240V (Standard)
Sensor	S2S	Spool-piece type sensor
	S2T	Tank-Mount type sensor
	S2C	Clamp-on type sensor Pipe size, XXXmm = Diameter
Pipe	D_XXX	DIN Standard, XXX = Pipe diameter in mm
	J_XXX	JIS Standard, XXX = Pipe diameter in mm
	A_XXX	ANSI Standard, XXX = Pipe diameter in mm
	F_XXX	Flange to Flange size (Unit: mm), Standard 500mm
Option	C_XX	Total sensor cable length (Unit: m), Standard 10m
	DC1	DC12V
	DC2	DC20~30V
	RS4	RS485 (Standard RS232)
	MOD	Modbus communication
	SMK	Sensor mounting kit
Note	Ex) C2S2-S2C-D_100-F_500-C_12 Clamp-on controller and sensor, Pipe DN100, Flange 500mm, Total sensor cable length 12m	