

# Next Step in Inline Consistency Measurement

Valmet Optical Consistency Measurement





# Valmet OC – Inline Consistency Measurement Has Never Been Easier

## Long experience

Valmet has utilized optical techniques for many years, not only in consistency transmitters but also in more advanced analyzers typically used in the pulp and paper industry as well as waste water treatment. Particularly in low-consistency measurements, optical transmitters are frequently the only possible measurement technique to provide reliable results and the Valmet Optical Consistency Measurement (Valmet OC) has gained a deserved reputation for accuracy, reliability and ease of installation. Continued development for applications that have been particularly challenging for optical consistency transmitters has expanded the Valmet OC family with transmitters optimized for use with eucalyptus pulp, recycled fiber or chemical pulps. Besides measuring total consistency,

further developments now allow the possibility to measure ash as well.

## Versatility

Sharing the same basic components and modules optimized for each application, Valmet OC transmitters offer the full advantages of HART, Profibus PA technologies as well as online condition monitoring with Fieldcare or AMS systems. With an operating range between 0 – 12 %, inline consistency measurement has never been easier.

## Ash measurement

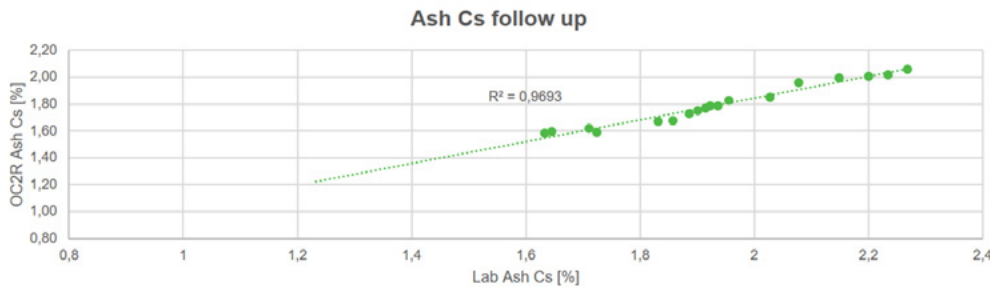
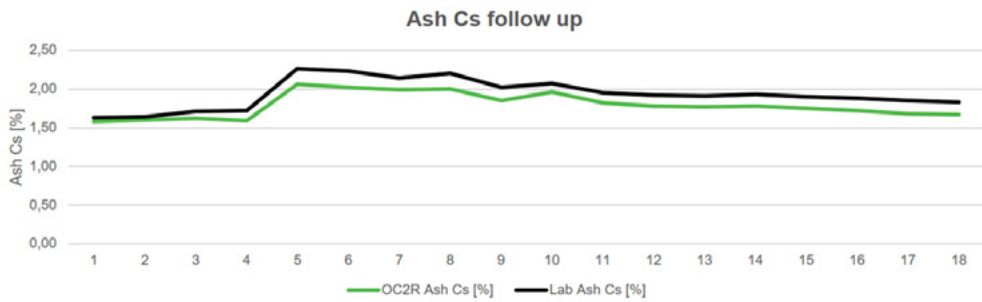
Valmet OC2R offers the possibility to measure ash in recycled pulp manufacturing applications as well as general stock preparation applications in paper, tissue and board. It shares the total consistency measurement method utilized in the original Val-

met Optical Consistency Transmitter, with the added capability of measuring ash content available as a second measured value. The addition of the ash measurement to total consistency opens new possibilities for greater control of stock preparation processes with all kinds of furnishes from virgin or recycled fiber to mechanical and chemical pulp.

## APPLICATIONS

### Mechanical pulp

The original Valmet OC with optimized probe design and multiple optical fiber channels employs the latest technology for applications in mechanical pulping: TMP, GW and CTMP; grinder, cyclone cleaner, latency removal, screening and low consistency refining.



Laboratory ash consistency correlation with Valmet OC2R.

## Chemical pulp

No longer limited to washed pulp, the Valmet OCS features a sapphire window to withstand chemicals used in chemical pulping. Applications cover the early stages of bleaching all the way to pulp storage or drying machine.

## Eucalyptus pulp

Eucalyptus pulp has different optical properties compared to other pulps that is now taken into consideration with the design of the special optical sensor and measurement method of the Valmet OCE. Results with the new transmitter in several com-

mercial installations have already been successful in applications where competing optical transmitters have failed. A typical application is the control of LC -refiner feed consistency, where improved refiner freeness results and reduced specific energy consumption have been reported.

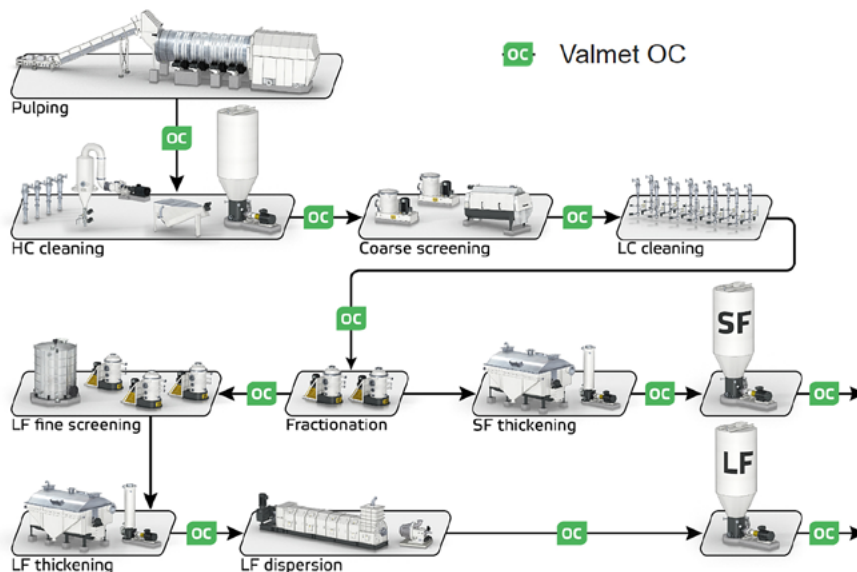
## Recycled fiber

OCC and RCF processes present a challenge for any measuring device where sand, metal and other contaminants as well as non-organic fillers are present. The Valmet OCR features a robust probe to survive the harsh physical environment and a measure-

ment that tolerates the ash variations that prevent the use of other optical consistency measurements. Installations in OCC processes before coarse screening have proved the probe's robustness and the total consistency measurement accuracy is excellent throughout the stock preparation area even with wide ash variations.

## Reliable measurement

Valmet OC uses a single light source and measures the reflected/backscattered light from the pulp suspension. The simple and effective installation method enables location close to the dilution point and pump for short



dead time and maximized controllability independent of flow. There are no electronic components or other sensitive parts on the probe, making it resistant to high temperatures, pressure and vibrations. The pencil probe has a self-cleaning design to avoid the adherence and accumulation of process substances and eliminates any risk of plugging risk.

### Simple and safe installation

A small profiled process coupling welded to the process pipe ensures that the probe position will be correct without any special tools or measure-

ments. Safe, easy and quick insertion and removal of the probe is provided by a 1/2" ball valve with a safety system that even at a high process pressure makes it quite easy to insert the probe, due to its small size.

### Quick and easy calibration

Calibration is done in just a few steps. Specific curves for varying pulp types are stored in the memory of the transmitter. When calibrating the transmitter, simply select a pulp type, press the sample button and collect a lab sample. Once the lab evaluation is done, the value is entered on the transmitter central unit keypad.

Since the transmitter has a very linear response, one-point calibration is all that is needed. However, in demanding applications multipoint calibration is available as well with Valmet OCR and Valmet OC2R.

### Low life time cost

The installation is simple with a minimum of welding work and the absence of sensitive components on the process pipe makes it robust. Being virtually fit and forget with no regular maintenance needed means that transmitter related costs stay low.

1. Place the front nut at the stop ring



2. Secure the front nut on the valve



3. Open the valve



4. Push in the probe and secure the rear nut



*The small-size probe provides easy and safe insertion. No tools are needed.*

The most advanced mechanical design in the market to answer users' needs



OC

OCR

OCS

OCE

OC2R

## Valmet OC technical specifications

Optical consistency measurement for the pulp and paper industry

	Valmet OC	Valmet OCR	Valmet OCS	Valmet OCE	Valmet OC2R
	pure / mechanical pulps	ash-containing pulps	chemical pulps	eucalyptus pulps	total Cs & ash
Output 1: Meas. range, Cs	0–12 %	0–12 %	0–12 %	0–12 %	0–12 %
Output 2: Meas. range, ash	–	–	–	–	0–10 %
Repeatability, Cs	± 0.01 %	± 0.01 %	± 0.01 %	± 0.01 %	± 0.01 %
Sensitivity, Cs	0.002 %	0.002 %	0.002 %	0.002 %	0.002 %
Filler content max.	30 %	100 %	30 %	30 %	100 %
Ash variation	± 2 %	No limit	± 2 %	± 2 %	No limit
pH	3–10	3–10	2–12	3–10	3–10
Pressure rating	PN25	PN25	PN25	PN25	PN25
Flow velocity min. - <b>turbulent flow</b>	0.3 m/s	1 m/s	0.3 m/s	0.3 m/s	1 m/s



## Sensor part

### Measurement

Span min. .... 0.5 % Cs  
Damping.....adjustable, 1–60 sec

### Materials

Enclosure..... Polycarbonate  
Wetted parts..... AISI 316L  
O-ring material ..... VITON

### Process conditions

Temperature.....0 to +120 °C (+32 to +248 °F)  
Vibration .....max. 2G (20 m/s<sup>2</sup>), 10–2000 Hz

### Environment

Ambient temperature ..... –20 to +60 °C (–4 to +140 °F)  
Temp. during storage..... –50 to +80 °C (–50 to +176 °F)

### EMC test standards

Radiated interference..... IEC 61000-6-2  
Interference immunity..... IEC 61000-6-4

### Weight

Sensor + Optical TCU ..... 3.9 kg (8.6 lbs)

## Valmet OC Optical TCU

### Connections

TCU to Optical Unit.....length 0.7 m (2.3 ft)  
Optical cable ..... length 5 / 10 m (16.5 ft / 33 ft)  
Operating power ..... 90–260 VAC, 47–63 Hz, 1 A  
Power consumption ..... max. 25 W

### Connections to mill system

- Analog outputs..... 2 current outputs, 4–20 mA  
- HART®.....12–35 VDC  
- Binary inputs..... 2 inputs, galvanically isolated  
12–28 VDC / 10 mA

### PROFIBUS PA Slave (option)

IEC 61158-2  
- Profibus power supply.....from the bus  
- Bus voltage..... 9–32 VDC, reverse  
polarity protection  
- Max. basic current..... 14.2 mA

### Connections to PC (configuration & diagnostics)

- DTM ..... HART®  
- PC-connection (service) ..... RS-232

### Environment

Ambient temperature ..... max. 50 °C (max. 122 °F)  
Enclosure class..... IP65 (NEMA 4)  
Vibration  
- TCU + Optical Unit .....max. 1 G (10 m/s<sup>2</sup>),  
10–2000 Hz

### Weight

TCU..... 2 kg (4.4 lbs)  
TCU + Optical Unit..... 3 kg (6.6 lbs)

### Options: when TCU and Optical Unit separated

- K15278, 10 m Sensor Cable option
- K13507, 10 m Extension Cable



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