

ACA

ASH CONTENT ANALYZER

Fast, reliable and accurate determination of the total mineral filler content and the percentage content of the individual filler components



ADVANTAGES

- non-destructive
- quantitative determination of fillers
- approx. 60 sec. measurement duration
- high accuracy of measurements
- results independent of operator
- easy portable (in a trolley)
- savings in time and energy
- optimal process control due to instant availability of measuring results

USERS

- paper and board makers
- chemical suppliers (e.g. retention aid)
- filler and pigment producers
- foil producers
- universities and institutes
- pulp producers

The combustion method (according to DIN 54370, ISO 1762 and 2144, TAPPI T 413 and 211) is the standard test method in the pulp and paper industry, which is used to determine the total ash content and a few selected individual fillers of a paper or board sample. The method is very time consuming, dependent on the operator (low accuracy up to 5%), destructive, since the sample is burned at two different temperatures, once at 525°C and if necessary additionally at 900°C. Both temperatures provide only limited information. A similar approach applies to foil producers.

BASIC

All standard fillers, which can be detected by the device are calcium carbonate, clay, talcum, titanium dioxide, barium sulfate and iron oxide. Further components can be evaluated by taking a closer look at the x-ray fluorescence spectrum, which can be done with the emtec PC software. A complete measurement takes approx. 60 seconds and the test is non-destructive. Compared to the combustion method, the ACA is much faster, a lot more accurate and allows a much deeper look into the paper. All this helps to optimize the production and converting process, because results are available almost instant, which enables very fast interventions in the process, if necessary. An optimal production and converting automatically leads to a better and constant product quality and a significant saving of cost.

MEASURING PRINCIPLE

The measuring method of the ACA is based on the combination of X-ray fluorescence analysis and the transmission method. First, the captured X-ray fluorescence spectra are qualitatively evaluated, and afterwards, they are quantitatively determined concerning the concentration of the detected filler components. The signal peaks are converted using complex mathematical functions (algorithms) in the corresponding concentrations. The figure below illustrates the measuring principle.

X-ray spectrometer to analyze the fluorescence photons: to evaluate the percentage of the individual filler components



Sensor to evaluate the percentage of the total filler concentration, calculated together with the data from spectrometer

Measurement	Setup	Information
Label	Comment	
Label 1	1	
96.0g/m ² Topside	User V	Start measurement
Total filler content		19.3%
Calcium carbonate		2.8%
Titanium dioxide		10.3%
Clay/Talcum		6.2%
Iron oxide		0.0%
Miscellaneous		0.0%
44	Standby	। ব্য

Display of results: mineral filler content of a paper sample (example)

APPLICATION AREAS

r&d

process & product optimization incoming control & quality assurance troubleshooting & complaint management benchmarking

MATERIALS

paper, board, plastic film, pulp, handsheets

TECHNICAL DATA

device dimensions	43.1 x 32.1 x 26.1 cm (H x W x D)
unfolded dimensions	43.1 x 32.1 x 38.3 cm (H x W x D)
device weight	15 kg
power supply	100-240 V AC, 50/60 Hz

MEASUREMENT

principle	X-ray fluorescence analysis
	and transmission method
radiation source	X-ray tube (gold, 10 kV, 5 $\mu A)$
helium supply	3 to 6 bar
mineral fillers	calcium carbonate, clay/talcum,
	titanium dioxide, barium sulfate,
	iron oxide and others
accuracy	approx. ± 0.5 % (abs.)
	depends on calibration
measurement time	approx. 60 sec.
sample measures	Ø 112,8 mm or DIN A4
	(min. 80 mm x 100 mm)

Simultaneous recording of ambient temperature and humidity with each measurement.

SOFTWARE

Emtec Measurement System EMS

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