

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
- 45 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

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



The combustion method (according to DIN 54370, ISO 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 and provides only limited information.

The emtec ACA Ash Content Analyzer in comparison to this measures the total ash content as well as almost all important single fillers, used in the paper industry and provides the results in percent.

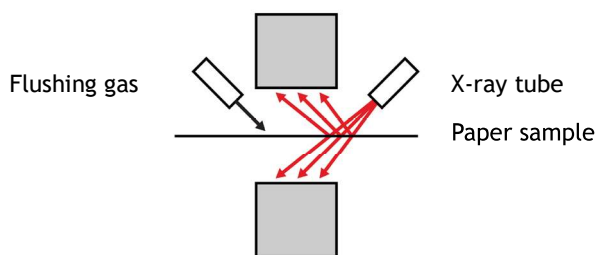
BASIC

All standard fillers, which can be detected by the device are calcium carbonate, clay, talcum, titanium dioxide and barium sulfate. 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. 45 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 Banknote paper	Comment 1	
Grammage 93.3 g/m ²	Side Topside	Paper grade User
Start Measurement		
Total filler content		Ø 18.8%
Calcium carbonate		Ø 6.3%
Titanium dioxide		Ø 10.3%
Clay/Talcum		Ø 2.2%
Barium sulfate		Ø 0.0%
Miscellaneous		Ø 0.0%
Standby		

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

APPLICATION AREAS

- r&d
- process optimization
- 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	14 kg
power supply	100-240 VAC, 50/60 Hz

MEASUREMENT

principle	X-ray fluorescence analysis
radiation source	X-ray tube (gold, 10 kV, 5 µA)
mineral fillers	calcium carbonate, kaolin, titanium dioxide, talcum, barium white
accuracy	approx. $\pm 0.5\%$ (abs.) depends on calibration type
measurement time	approx. 45 sec.
grammage	max 1000 g/m ²
Simultaneous recording of ambient temperature and humidity, at each measurement.	

SOFTWARE

Emtec Measurement System EMS

