

Spectrophotometer for Colour control of bulk solids/granules

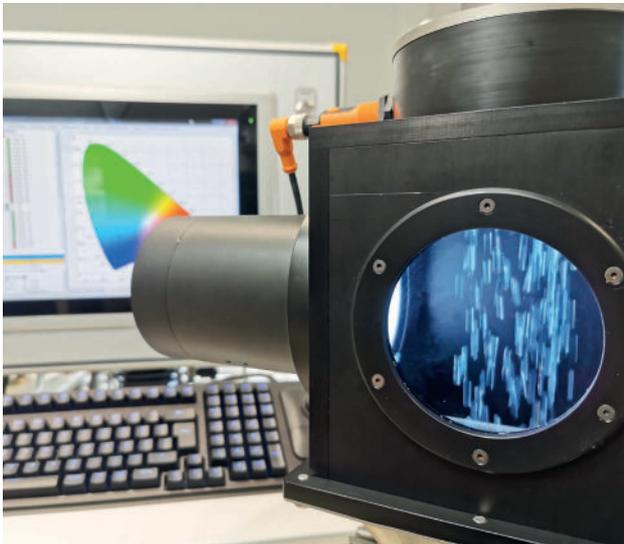
Colour measuring system
for measurement in- or atline





Quality control close to the process

For high-quality end products



Industry 4.0

In complex production processes quality control at the earliest possible point is essential. The system presented here allows 100% control of the product colour directly in production. Full integration in the process control system and quality database increases transparency of the process and even allows for control on the basis of determined colour values.

Cost saving

Due to the full integration of the system time is saved, process reliability and quality are increased and at the same time the reject rate is reduced.

Quality of the end products

In compounding, many of the materials used or produced are present as bulk materials. As intermediate products, they often determine the quality of the end product. That is why quality control close to the process is crucial for a high-quality end product.

Industry 4.0

Colour measurement system for in- or atline

More information

Continue on the web



- 1 Level sensor
- 2 Measuring head with 80 mm measuring surface cross-section
- 3 Pneumatic controlled material ejection

Technology for in- or atline measurement

The system consists of a spectrophotometer with a measuring head for diffuse illumination of the material. The measuring chamber is automatically filled with plastic granulate from the process, which is fed back into the process after the measurement.

The measuring unit is connected to the central unit via a fibre optic cable and an interface cable and is housed in a separate small control cabinet. There is an industrial PC with a touch screen for operating the unit, which can also be connected to the process control system via an industrial interface.



Smarte Benefits

Fast 100% control without process delay/intervention

The measuring set-up can easily be placed parallel to the running process atline. Material is pneumatically removed from the process via a by-pass and fed into the measuring chamber.

A fill level sensor monitors the fill level. When the level is reached, a measurement is automatically triggered and the spectrum of the injected material is determined.



After completion of the measurement, which takes only fractions of a second, the sample material is discharged via a pneumatically controlled valve and added back to the process. Another special feature of the system is the laterally arranged measuring head. Long-term stable and durable light-emitting diodes are used as the light source. These last virtually the life of the device and do not need to be replaced.

A diffuse illumination with a large measuring spot of 80 mm diameter is generated in the barium sulphate-lined wall of the measuring head. This ensures uniform illumination of the inhomogeneous sample surface. By averaging the colour value over a large area, the accuracy/reproducibility of the system is noticeably increased.

The colour of the sample material is strongly temperature-dependent. Neglecting this fact leads to incorrect measurements. For this reason, the instrument is optionally equipped with an integrated infrared thermo-meter, which closes a large gap in the measurement methodology of colours. This allows colour deviations due to the thermochromic behaviour of the samples to be accurately assessed.

For in-process tests in quality assurance and laboratories, a corresponding handheld measuring device with an external



measuring adapter and identical design is available.

The perfect introduction to the measurement of bulk solids or granulates.

Technical data

At a glance

Measuring geometry	d/0°
Measuring area	80 mm
Spectral range	400 nm to 700 nm
Spectral resolution	Holographic grating spectrometer HWB at 500 nm < 10 nm Scanning in 3.5 nm steps 115 x 16-bit values per scan
Monochromator	diffraction grating
Measuring range	0 to 175%
Standard illuminants	D65, D55, D50, A, C, F11
Standard observer	2° (1931) und 10° (1964)
Reproducibility	$\Delta E \leq 0,05$ CIELab (range determined from 10 measurements of the white standard supplied)
Colour spaces	XYZ, Yxy, ΔE CIE L*a*b*, L*u*v*, L*C*h, Hunter Lab dE, dE94, dE2000, CMC1:1, CMC2:1, dECMCdyn CIE-L*a*b* diagram incl. tolerance limit
Quality control Tolerance limits of Colour differences	ΔE CIELab; ΔL , Δa , Δb ; Δu , Δv ; ΔL , ΔC , Δh ; Min/Max, PASS/ FAIL, ΔE_{CMC} (1:1 und 1:2)
Other colour values	Contrast: LRV – BS 8493:2008, various whiteness values, various yellow values, grey index
International standards	ASTM D 2244, D 6290, E 308, E 1164 DIN 5033, 5036, 6174 DIN EN ISO 11664 ISO 7724
Calibration	Automatic white balance
Dimensions/ Weight	400 mm x 500 mm x 200 mm 12 kg
Light source	White and blue LEDs Service life > 20 years
PC connection	Profibus, Profinet, Ethernet, RS232/485 and others





Sponsored by



Federal Ministry
for Economic Affairs
and Energy

on the basis of a decision
by the German Bundestag

ColorLite GmbH

Am Mühlengraben 1
37191 Katlenburg-Lindau
Tel.: +49 (0)5552 999 580
info@colorlite.de
www.colorlite.de