# Spectrophotometer
# HK7

## continuous online colour measurement

# Spectrophotometer

range of application

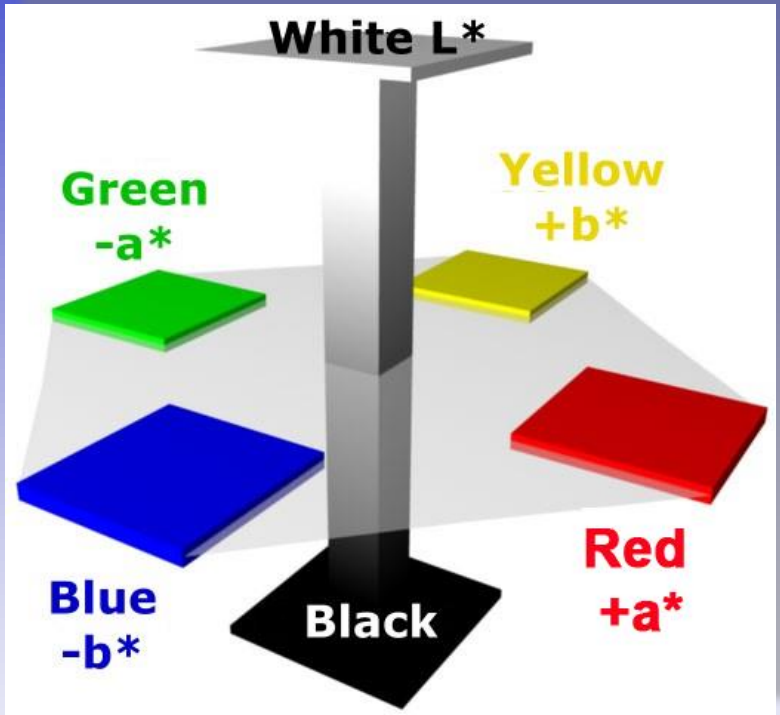
Colour measurement based on the standard CIELAB.

Continuous online-identification of colours and indication of the deviation from the colour-standard.

Colour determination of products with smooth and planar surfaces, no abrasive bulk material.

# Spectrophotometer

guideline




The CIELAB-System is a colour space, which was specified by the International Commission on Illumination CIE (Commission Internationale d'Eclairage) in the year 1976. It was further derived from the CIE colour system and is based on the CIE “master” space which was introduced in the year 1931. CIELAB system is today the most common colour system. On the basis of this equipment independent 3D-colour model, colour differences can be identified numerically. The model is impartial and complies nearly the human perceptiveness, by adapting the geometrical distance between two colours in the colour space with the human perception.

L* ,the light intensity, from 0 = absolute black to 100 = absolute white.
a* describes the red - green axis. Negative values are green, the positives are red.
b* describes the yellow - blue axis. Negative values are blue, the positives are yellow.

# Spectrophotometer

## funktionality and configuration

-aluminium pressure casting housing
hxwxd: 230x280x110mm

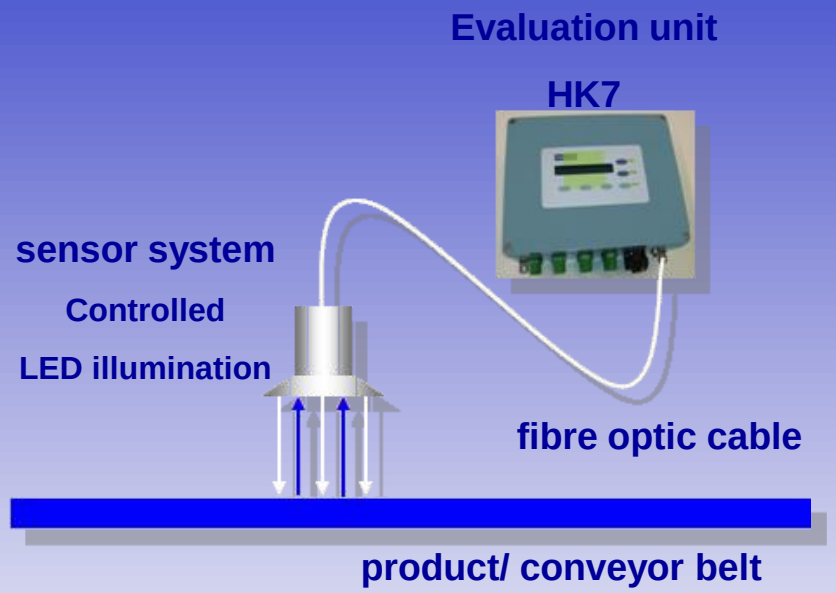
-keypad

-4 analog outputs 0/4 – 20mA

-RS232 or RS485

-connection sensor system – evaluation unit: fibre optic cable

-sensor system: LED-illumination with 7 LEDs




Continuous, controlled LED illumination and identification of the product colour in the colour space after CIELAB.
The evaluation results in the visible light sector from 390 – 720 nm. The distance between sensor system and product has to be kept obligatory absolute non-varying.
The colour evaluation, that is the output of the measurement results, occurs in 4 channels: L*, a*, b*or dL*, da*, db* and dE*.

# Spectrophotometer

measurement design

The sensor system is located max. 150mm over the to be detected product surface. The product surface is approximatively smooth and planar.

The products (sugar, matals, textiles, food, plastics) are moving on a conveyor belt under the sensor system. Fine powder products are planed by a scraper.

For the attainment of top-quality measurement results the environment has to be dust-free.

With the option “compressed-air“ the measurement can be kept free of dust.

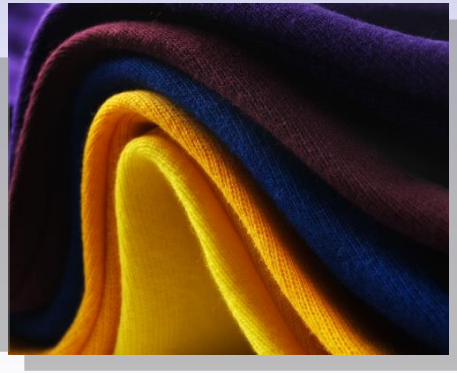
# Spectrophotometer

applications

The range of feasible applications is very large. The material of the product is not relevant, but the surface has to be aproximatively smooth and planar.

Plastics industry
Food industry
Textile industry
Chemicals industry
Printing industry
Lamination industry
Cosmetics industry
Research

Coating of chip boards
Lacquering of plates
Surfaces of cheese blocks
Textiles, panels, webs
Degree of whiteness, i.e. sugar
Meat processing



# Spectrophotometer

product types

## HK7-Versions

HK7-1: basic configuration

HK7-2: basic configuration
+ automatical white balance

HK7-3: basic configuration
+ whiteness index
+ triple sensorsystem

HK7-4: basic configuration
+ whiteness index
+ triple sensorsystem
+ automatical white balance

# Spectrophotometer

product types

## HK7-Versions

### HK7-1: basic configuration


# Spectrophotometer

product types

## HK7-Versions

HK7-2: basic configuration
+ automatical white balance


# Spectrophotometer

product types

## HK7-Versions

HK7-3: basic configuration
+ whiteness index
+ triple sensorsystem
+ distance-lasersensor


# Spectrophotometer

product types

## HK7-Versions

HK7-4: basic configuration
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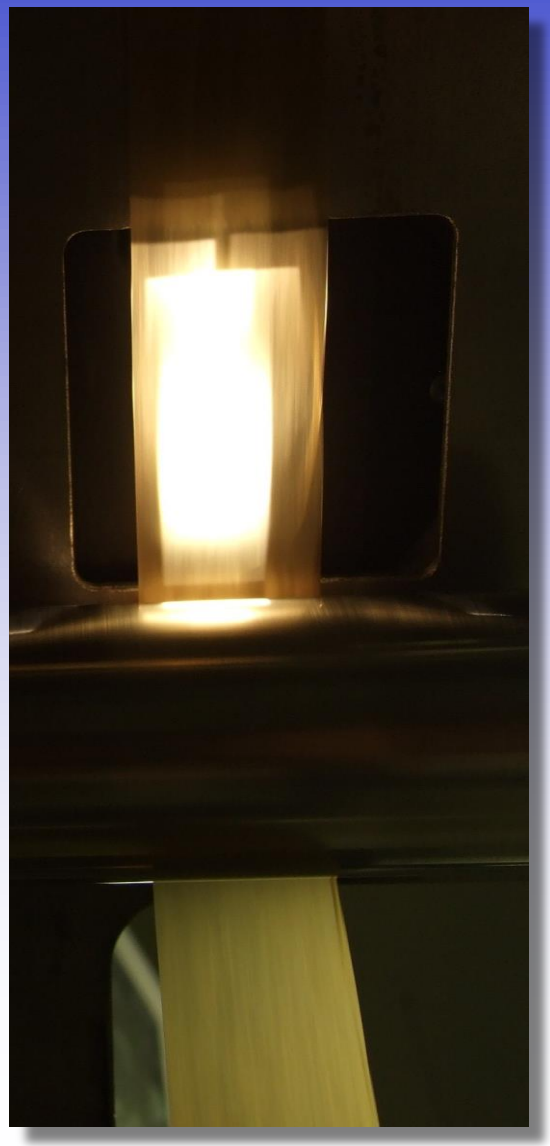
# Spectrophotometer

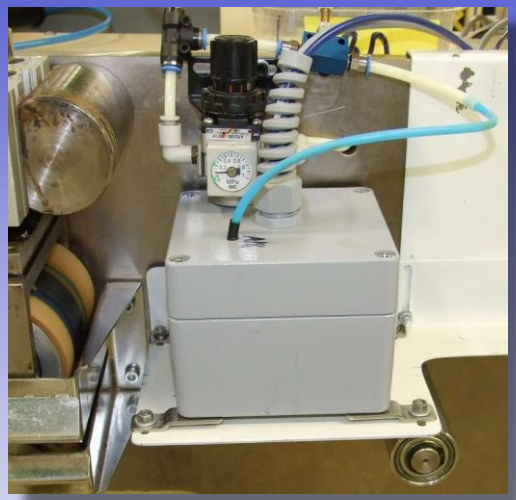
**examples**

colour measurement of
syntetic sausage casing

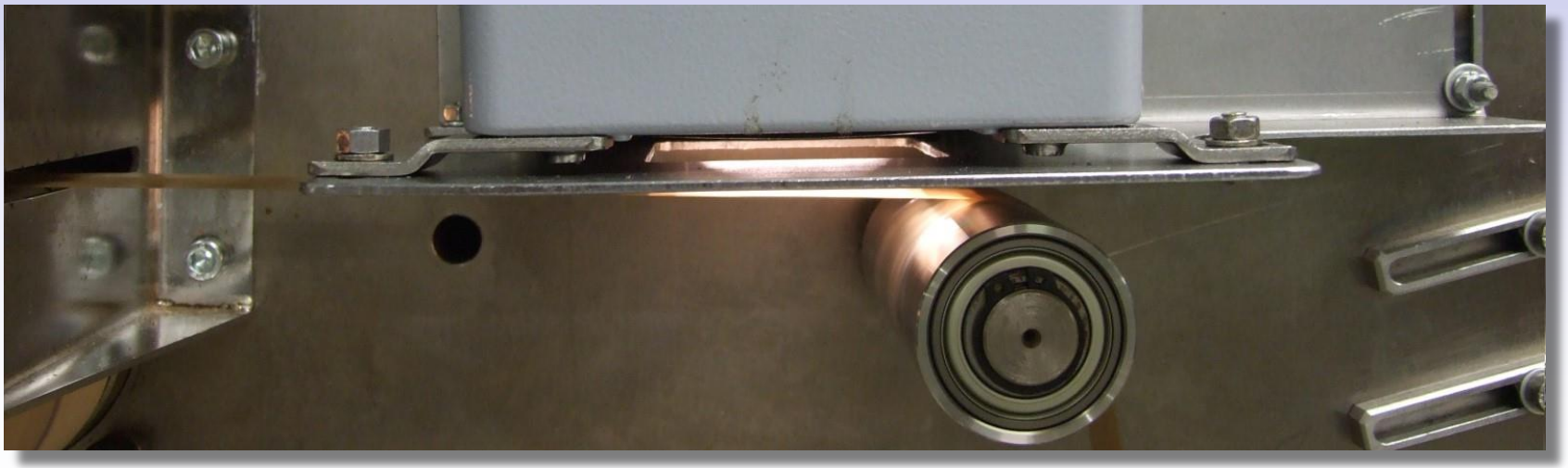


# Spectrophotometer

examples



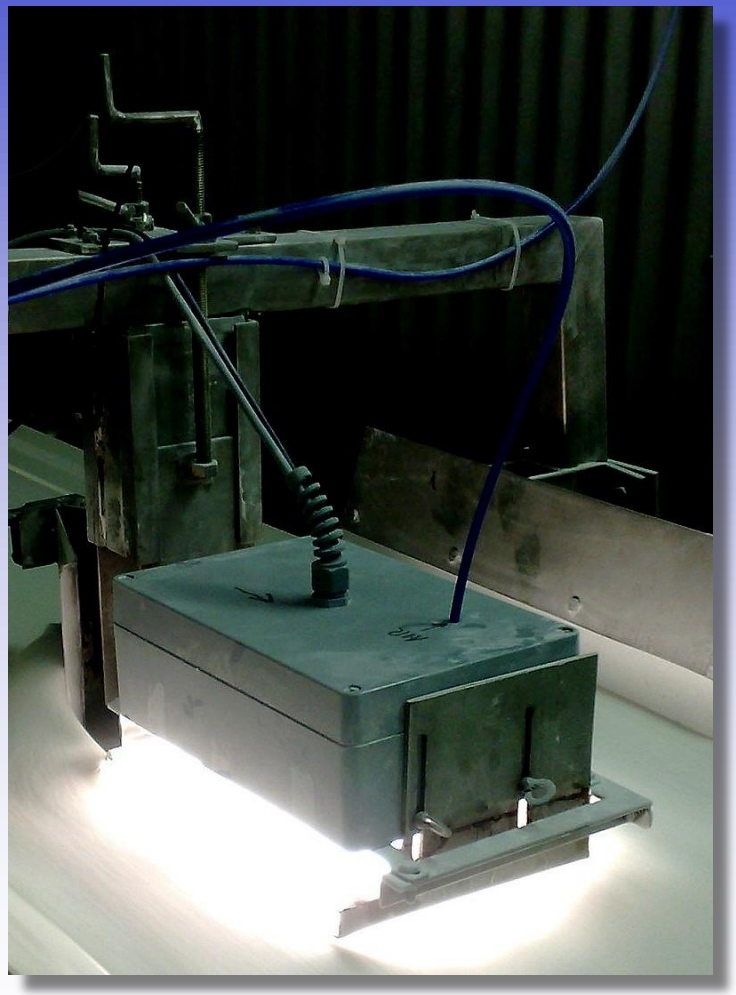
colour measurement
of
syntetic sausage
casing



# Spectrophotometer

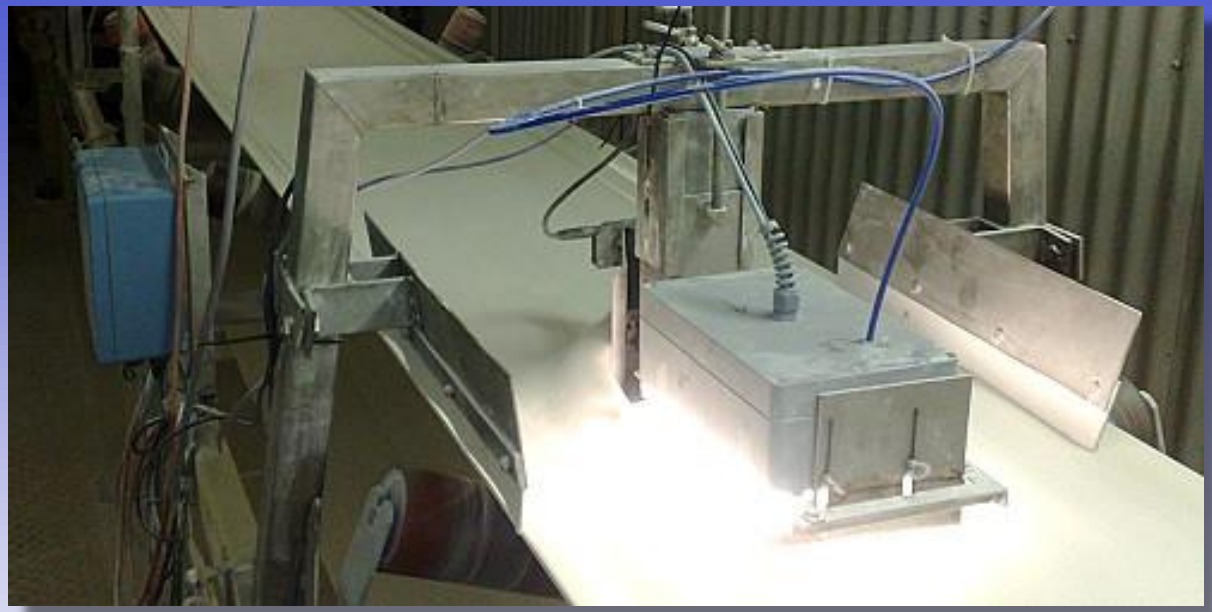
examples

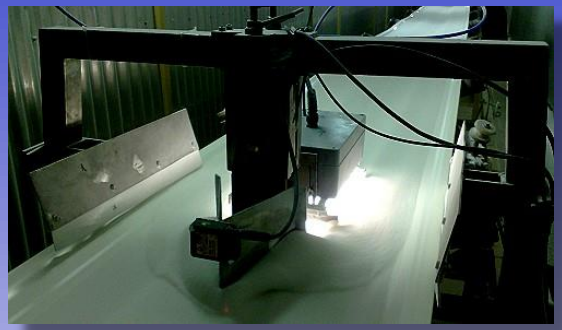
colour measurement
degree of whiteness
sugar

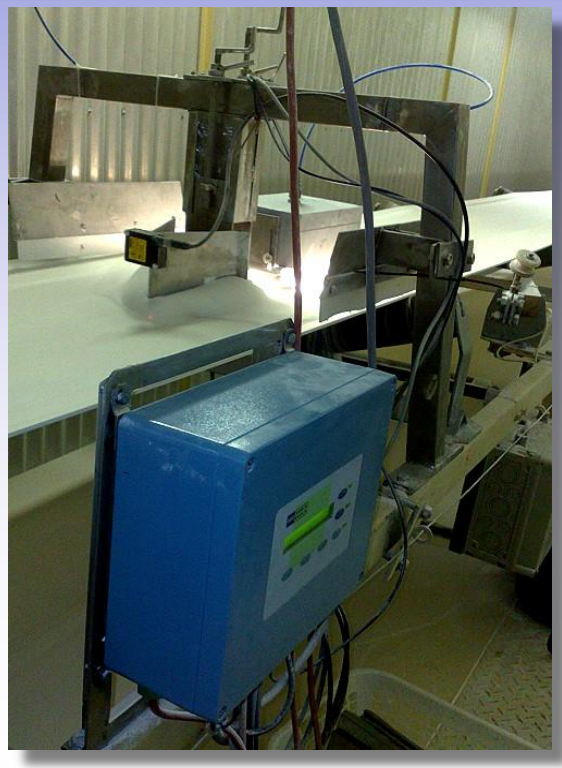


# Spectrophotometer

examples







colour
measurement
degree of whiteness
sugar

# Spectrophotometer

technical data

| | |
|---|---|
| Measure geometry | 45/90 Spot size at 100mm distance appr. d=60mm |
| Standard lights | D65, A,C, |
| Standard observer | 2* (1931), 10* (1964) |
| Colour space | CIEL *a*b*.dE* |
| Spectral range | 390nm – 720nm |
| Spectral resolution | 1,3nm |
| Reproducibility | dE=0,1 |
| Gauge head dimensions | |
| -basic configuration | 120 x 120 x 90mm |
| -automatical white balance | 120 x 220 x 90mm |
| -triple sensorsystem | 230 x 280 x 110mm |
| System size | 230 x 280 x 110mm |
| Indication | Relative values, absolute values or reflectance spectrum in PC |
| Calibration | With implemented white standard |
| PC-interfaces | Seriell RS 232 or RS 485 |
| Power supply | 85 – 270 VAC |
| Protection class | IP 65 |
| Environmental temperature | -20° - +40° C |
| Product temperature | -20° - +70° C |

# Thank you

## for your attention !

Harrer & Kassen GmbH
Geschäftsführer Dr. Dipl. Ing. Horst Harrer
Am Heschen 4-6
75328 Langenbrand
Germany
Tel.: +49 (0)7084/9248-0
Fax: +49 (0)7084/924829

HARRER KASSEN