Principle:
There are two methods of determining beer colour (a visual method [1], Application A01, and a spectrophotometric method [2]). The spectrophotometric method eliminates the subjective impression of the human eye associated with the use of a colour disk (visual method).

Range of application:
This method is suitable for brewery worts, beers, liquid malt substitutes and laboratory worts (congress worts).

Note/Interferences:
The spectrometric absorption curve does not represent colour as viewed through the human eye, as light of equal intensity influences the eye differently in different parts of the spectrum. Moreover, the flanks of the absorption curves at 430 nm slope steeply, so that slight measurement errors can occur. In addition, there are comparative differences between pale beers and diluted dark beers. Turbidities cause inaccurate results to be obtained.

Material

LPV422.99.00001	Spectrophotometer DR 2800 or
LPV424.99.00001	Spectrophotometer DR 3800 or
LPV408.99.00001	Spectrophotometer DR 5000 or
LPV440.99.000x1	Spectrophotometer DR 3900 or
LPV441.99.000x1	Spectrophotometer DR 6000
	or older Spektrophotometer from Dr. Lange
LZP045	10 mm glass cuvette, square

Sample preparation and evaluation:

The beer colour is measured in a 10 mm rectangular glass cuvette (LZP045) at 430 nm. The sample should be diluted, so that the reading is within the measuring range (<60 EBC), and the photometer should be zeroed against a blank-cuvette (a cuvette filled with distilled water). Eliminate the carbon dioxide from the sample. The sample can be filtered through a membrane filter (0.45 µm, LCW916) to remove turbidities. This filtration is not necessary if the turbidity of the (diluted) sample is less than 1 EBC turbidity unit.

Literature
[1]: MEBAK Brautechnische Analysenmethoden 2002; Band II, S. 87
[2]: MEBAK Brautechnische Analysenmethoden 2002; Band II, S. 88 ff

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Programming the Photometer:

Programming des CADAS100 (LPG158):
Program no.:   1
Name: Beer colour
Symbol: BF
Meas. Points: 1
Wavelength: 430 nm
Factor 1:   25.00
Constant: 0
Unit: EBC
Control no.:   **6**

Programming CADAS100 (LPG210, LPG248):
Call the test under the symbol BF and vary it if necessary.
Program no.:   1
Name: Beer colour
Symbol: BF
Meas. Points: 1
Wavelength: 430 nm
Factor 1:   25.00
Constant: 0
Unit: EBC
Control no.:   **6**

Programming CADAS30/50/30S/50S:
Test no.:   001
Parameter: Beer colour
Name: EBC
Process: 02
Wavelength: 430 nm
Factor 1:   25.0
Lower limit: 0
Upper limit: 60
Unit: EBC
Control no.:   **6**

Programming CADAS200 (*as User*):

No.:	770
Symbol:	EBC
Parameter:	Beer colour
Version:	01
Barcode:	nein
Band Wirth:	5 nm
Sequence:	E1W1
Evaluation 1:	
Ident.:	Beer colour
Name:	C1
Formula:	E1*F1
Lower limit:	0
Upper limit:	60
Unit:	EBC
Res. in DB:	yes
Show res.:	yes
Variables:	
W1:	430 nm
F1:	25.00
Control no.:	**8**

Programming XION 500:

Measurement with factor:	E*F1+F2
Test number:	01
Testname:	Beer colour
Wavelength:	430 nm
Factor 1:	25.0
Factor 2:	0
Lower limit:	0
Upper limit:	60
Unit:	EBC
Control no.:	**8**

Programming DR 5000 / DR 6000:

Programming as User test

Program:	z. B. 952 / 9052
Name:	Beer colour
Type:	Single wavelength
Unit:	Units
Wavelengths:	430 nm
Resolution:	0.1
Chemical form:	EBC
Calibration:	Formula
	$C = a + bA$ with $a = 0$ and $b = 25$
Upper limit:	60
Lower limit:	0

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UNITED FOR WATER QUALITY

Determination of beer colour

Spectrophotometric method

Measurement procedures:
CADAS100 (LPG 158 only):
- Select „Test" mode
- Select symbol „$BF"
- Insert blank-value cuvette (cuvette filled with distilled water) and press the „NULL" [zero] key to start the zero measurement.
- Introduce prepared sample into cuvette and press the „MESS" [measure] key to start the measurement
- The result is displayed in EBC units

CADAS100 (LPG210/LPG248):
- Select „Test" mode
- Select symbol „BF"
- Insert blank-value cuvette (cuvette filled with distilled water) and press the „NULL" [zero] key to start the zero measurement.
- Introduce prepared sample into cuvette and press the „MESS" [measure] key to start the measurement
- The result is displayed in EBC units

CADAS30S/50S
- Select programmed test from the test database
- Insert blank-value cuvette (cuvette filled with distilled water) and press the "NULL" [zero] key to start the zero measurement.
- Introduce prepared sample into cuvette and press the „MESS" [measure] key to start the measurement
- The result is displayed in EBC units

CADAS30/50 / XION500 / CADAS200:
- Select programmed test from the test database
- Insert blank-value cuvette (cuvette filled with distilled water) and press the blue key to start the zero measurement.
- Introduce prepared sample into cuvette and press the green key to start the measurement
- The result is displayed in EBC units

DR 2800 / DR3800 / DR3900
- Select test no. 771 from the Stored Programs
- Insert blank-value cuvette (cuvette filled with distilled water) and press Zero to start the zero measurement.
- Introduce prepared sample into cuvette and press Read to start the measurement
- The result is displayed in EBC units

DR 5000 / DR 6000:
- Select self-programmed test from the User Programs
- Insert blank-value cuvette (cuvette filled with distilled water) and press Zero to start the zero measurement.
- Introduce prepared sample into cuvette and press Read to start the measurement
- The result is displayed in EBC units

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