Determination of Beer Color According to EBC and ASBC Using Hach Laboratory Equipment

Introduction

Color is an essential quality parameter of beer, providing information about raw materials, brewing process, and filtration level.

In Europe, beer color is primarily determined using the EBC method (European Brewery Convention), while in North America, the ASBC method (American Society of Brewing Chemists) is applied.

The EBC and ASBC scales are closely related but differ slightly in wavelength, calculation factors, and scale units.

Normative Basis

Standard/Method	Measurement Wavelength	Unit	Measurement Principle
EBC	430 nm	EBC units	Photometric absorption of a diluted sample
ASBC	430 nm	SRM (Standard Reference Method)	Photometric absorption, conversion between SRM and EBC

Formulas: EBC = Absorbance (A_{430}) × 25 × dilution factor | ASBC = Absorbance (A_{430}) × 12.7 × dilution factor | EBC ≈ 1.97 × ASBC

Measurement Principle

For both methods, the beer sample is filtered or centrifuged to minimize turbidity effects.

The absorbance is then measured at 430 nm in a cuvette with a defined path length (typically 10 mm).

Use of Hach Laboratory Equipment

Hach offers various photometers and spectrophotometers suitable for EBC and ASBC determinations:

Suitable instruments:

Hach DR6000 UV-Vis Spectrophotometer

- High optical precision
- Pre-programmed EBC and ASBC methods
- Automatic conversion between EBC and SRM values

Hach DR3900 VIS Photometer

- More compact design, also with some stored brewery methods

Hach Lico 690

- Precision spectrometer for beverage color measurement

Hach Cuvettes & Accessories

- 10 mm quartz cuvettes for precise measurements at 430 nm

Laboratory Procedure

Avoid The Costs of Flying Blind

1. Sample Preparation
- Bring beer to room temperature
- If turbid: filter or centrifuge

2. Dilution (if necessary)
- Especially for dark beers to avoid absorbance saturation (> 2 A)

3. Instrument Calibration
- Zero with distilled water

4. Measurement
- Fill cuvette
- Measure at 430 nm

5. Calculation
- Instrument directly provides EBC/SRM or values can be calculated using the formulas

6. Documentation
- Record result, dilution factor, date, and batch number

Quality Assurance

- Regular verification using color standard solutions (e.g., Hach dye standards)
- Annual instrument maintenance and calibration

Advantages of the Hach Solution

- Integrated EBC and ASBC methods, no manual calculation required
- Robust, reproducible results
- Wide range of accessories for breweries
- Low sample volume required

EBC	Example	Beer Color
4	Pale Lager, Witbier, Pilsener, Berliner Weisse	
6	Maibock, Blonde Ale	
8	Weißbier	
12	American Pale Ale, India Pale Ale	
16	Weißbier, Saison	
20	English Bitter, Extra Special Bitter	
26	Biere de Garde, Double IPA	
33	Dunkles Lager, Märzen, Amber Ale	
39	Brown Ale, Bock, Dunkelbier, Porter	
47	Irish Dry Stout, Doppelbock, Porter	
57	Stout	
69	Foreign Stout, Baltic Porter	
79	Imperial Stout	

Source: http://de.wikipedia.org/wiki/EBC_(Bier)

Conclusion

Determining beer color according to EBC and ASBC using Hach laboratory equipment is a precise, fast, and standards-compliant method suitable for quality control in both small craft breweries and large industrial brewing operations.

With pre-programmed methods and reliable instrumentation, process variations can be detected early, ensuring consistent product quality.

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