Industry Standard Practices

**SRM & EBC**

**ASBC SRM**

The American Society of Brewing Chemists (ASBC) has created a standard method for beer color specification known as the Standard Reference Method (SRM).

SRM is determined by measuring the absorbance of the beer at a wavelength of 430nm with a 1/2” path length. The absorbance is then multiplied by 10 to obtain the SRM value (sometimes referred to as degrees Lovibond, °L).

**EBC**

The European Brewing Convention (EBC) has a similar method. It is also based on absorbance at 430nm, but with a 1cm path length. For EBC values, the absorbance is then multiplied by 25.

**Conversion.** Since both metrics are based on absorbance at 430nm, conversion can be made by simply adjusting for the differences in path length and multiplicative factors. Thus the conversion is $\text{EBC} = 1.97 \times \text{SRM}$ or $\text{SRM} = \text{EBC}/1.97$.

There was an older EBC metric based on absorbance at 530nm. Conversion between the old EBC and SRM metrics required a nonlinear approximation.

The figure above provides some rough guidance on SRM and EBC values for typical brews.
Beer-Color Dimensionality? Mononumerosis Again?

The EBC and SRM methods naturally beg the question “can beer color be well described with only one variable?”

In tribute to Joseph Lovibond, the brewer who is credited with inventing the visual colorimeter, the author has spent years collecting beer samples and measuring them (1cm path) with a trichromatic (CMY) Lovibond Tintometer available at the RIT-MCSL.

Light and Colour Theories and their Relation to Light and Colour Standardization
by Joseph W. Lovibond
Illustrated by Hi Plates Colouried by Hand
Lovibond Tintometer Readings for Various Beers

The online database has been growing for years and the data were finally put to use to answer the dimensionality question. The CMY measurements for over 100 brews are plotted below. Principal Components Analysis was performed and the percent of variance explained by each of the three dimensions was 85%, 14%, and 1%. It appears that two dimensions are required. Analysis of the characteristic vectors shows that the first dimension is light-dark, the second yellow-blue, and the third red-green. This follows opponent theory, but puts more emphasis on yellow-blue.

Evolution of the Method.

The writer was formerly a brewer, and this work had its origin in an observation that the finest flavour in beer was always associated with a colour technically called "golden amber," and that, as the flavour deteriorated, so the color assumed a reddish hue. It was these variations in tint that suggested the idea of colour standards as a reliable means of reference.

Joseph W. Lovibond

Beer’s Law?

The problem, ultimately, is that – incredible as it may seem – beer does not always follow Beer’s Law. . . . Over the years, several authors have asserted that beer obeys Beer’s Law. Unfortunately, these studies appear to have examined a very limited portion of the beer color universe. It appears that Beer’s Law does hold for beers with a final color of less than 5 or perhaps 10 SRM. [Daniels ... referenced by Viggiano] You can’t dilute Guinness to make a lager. -MF