APPLICATION NOTE – MEASURING THE GRAVITY AND ALCOHOL CONTENT OF BEER

Application Need: Beer brewers need to know the original extract of beer to control the fermentation process and to correctly label products for government taxation requirements.

Solution: Analyze beer using the Reichert Density4 density meter and the AR9 refractometer.

Overview

The combination of the Reichert density meter and refractometer allow you to measure the **gravity** (original and specific), **wort content**, **fermentation degree** and **percent alcohol volume** of beer.

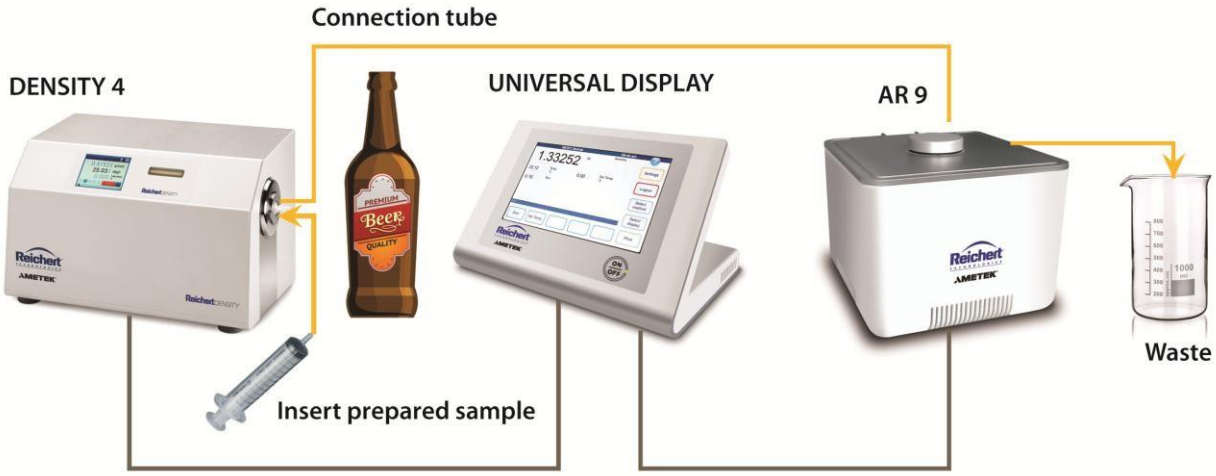
By using a nomogram (according to Schild and Irrgang) and the Balling formula, you can identify the alcohol content, original gravity, original extract, true extract, the apparent extract in degrees Plato (°P), and the degree of fermentation in precentages of different sorts of beer through the measured density and refractive index. We have scaled the nomogram for the refractometer-density combination, and all parameters are automatically calculated. The results can be displayed and saved electronically.

The **original gravity** describes the amount of fermentable and unfermentable substances that the wort contains before fermentation. With the measured original gravity, the **original extract** can be calculated (g sugar in 100g of wort (°P)).The **true extract** (Ew) is the amount of extract which was not converted to carbon dioxide or alcohol during the fermentation process.

The **final gravity** is measured after the fermentation process. The **apparent extract** (Ed) is generated out of the final gravity. The degree of fermentation describes the amount of original gravity that could be fermented during the fermentation process.

Process for measuring the gravity and alcohol content of beer

Reichert's Density4 Density Meter and the AR9 Refractometer need to be connected to the Universal Display. To avoid bubble formation, the beer sample has to be in-situ degassed before the measurement. Then the prepared sample of beer is injected into the inlet valve using disposable Luer-tip syringes. The inlet valve of the density meter is connected to the flow cell of the refractometer, so that the sample can be injected in both instruments simultaneously.



The refractive index of the AR9 and the density value of the Density4 are transmitted to the Universal Display, which calculates and displays the beer parameters. The original gravity is shown in original wort%, while the alcohol concentrations are in standard units (like % vol and % weight). Besides using these standard protocols, customers can program and use their own protocols.

Product Recommendations:

Density4 Density Meter
Reichert Cat #14004000

and

AR9 Refractometer with Universal Display
Reichert Cat #14009000