

BELLINGHAM + STANLEY WINE REFRACTOMETER

HOW IT WORKS

The refractive index and the specific gravity of wines and ciders are affected by both the alcohol and the residual sucrose that it contains, in such a way that if the 'units' of the S.G. reading are subtracted from the refractive index measured on a suitable scale, the difference (R minus D) is directly related to the alcoholic content, which can be read off from a table.

Only a few drops of wine are needed to make the refractometer reading, while the S.G. is measured in the usual way (most serious wine makers possess a hydrometer). The process takes only a few minutes to carry out, and an accuracy of about 0.5% alcohol can be obtained using reasonable care in ensuring that both readings are made at the same temperature.

If the instrument is used with care, and cleaned as recommended after use, it should give many years of accurate and trouble free service.

USING THE WINE REFRACTOMETER

Equipment required:

Wine refractometer (Eclipse or OPTi models)
Hydrometer or Saccharometer
Hydrometer jar
Pipette or other suitable applicator

Siphon off enough of the finished wine to fill the hydrometer jar to required level, and leave all the equipment with it in a place free from draughts and direct sunlight for at least an hour to attain room temperature.

Measure the S.G. as accurately as possible and record.

Ensure that the refractometer prism is clean and then place one or two large drops of wine on the instrument using a suitable applicator. Take a measurement of the 'R' reading and record either visually using an Eclipse refractometer or automatically using an OPTi refractometer.

The ABV can then be calculated using the formula below or by using our ABV Calculator located on our website at www.bellinghamandstanley.com/mobile

EXAMPLE

Light dry table wine

S.G. reading might be 0.993, from which the D reading is minus .007 or -7 units.

Refractometer reading might be 37.

As the D reading is negative (less than 1.000) the (R - D) reading becomes (R - (-7)) which is (R + 7), that is 44.

From the table, find the alcohol content 18.8° proof, or 10.7% v/v.

Sweet dessert wine

S.G. reading 1.015 from which D is 15.

Refractometer reading 72.5.

(R - D) is 57.5.

Alcohol content from table 27.5° proof or 15.7% v/v.

PRECAUTIONS TO IMPROVE ACCURACY

- It is important that both the R and the D readings are taken **at the same temperature**.
- Handle the refractometer, the hydrometer and the jar as little as possible.
- Make sure that the prism is cleaned and dried between each reading, using a little clean water **at room temperature**, and a soft cloth to dry.
- Leave everything for as long as possible between readings to equalise temperature differences, but without allowing evaporation.
- Make sure the scale of the instrument is in sharp focus before taking readings; adjust the eyepiece if necessary (Eclipse model only)
- Look at the quality of borderline obtained. Poor sharpness indicates insufficient wine on the prism, or temperature gradients across the prism, or that the prism was not properly dried after the last reading (Eclipse model only).
- If in doubt, clean and dry the prism, leave for a while, and repeat measurements from the start. Measuring the same wine sample twice in quick succession is a useful indication of the reliance that should be placed on the results obtained.
- The zero of the refractometer can be checked at any time by using distilled water at 20°C. When the R reading should be 15 within ½ a scale division (Eclipse model only).
- Always clean the plastic illuminator plate when cleaning the prism (Eclipse model only).

ALCOHOL CONTENT TABLE

R - D	° Proof	%	R - D	° Proof	%	R - D	° Proof	%
40.0	16.3	9.3	55.0	25.9	14.8	70.0	35.5	20.3
40.5	16.6	9.5	55.5	26.2	14.9	70.5	35.8	20.4
41.0	16.9	9.7	56.0	26.5	15.1	71.0	36.1	20.6
41.5	17.3	9.9	56.5	26.9	15.3	71.5	36.5	20.8
42.0	17.6	10.1	57.0	27.2	15.5	72.0	36.8	21.0
42.5	17.9	10.2	57.5	27.5	15.7	72.5	37.1	21.2
43.0	18.2	10.4	58.0	27.8	15.9	73.0	37.4	21.3
43.5	18.5	10.6	58.5	28.1	16.0	73.5	37.8	21.6
44.0	18.8	10.7	59.0	28.4	16.2	74.0	38.1	21.8
44.5	19.2	10.9	59.5	28.8	16.4	74.5	38.4	21.9
45.0	19.5	11.1	60.0	29.1	16.6	75.0	38.7	22.1
45.5	19.8	11.3	60.5	29.4	16.8	75.5	39.0	22.3
46.0	20.1	11.5	61.0	29.7	17.0	76.0	39.3	22.4
46.5	20.5	11.7	61.5	30.1	17.2	76.5	39.7	22.6
47.0	20.8	11.9	62.0	30.4	17.4	77.0	40.0	22.8
47.5	21.1	12.1	62.5	30.7	17.5	77.5	40.3	23.0
48.0	21.4	12.3	63.0	31.0	17.7	78.0	40.6	23.2
48.5	21.7	12.4	63.5	31.3	17.9	78.5	40.9	23.4
49.0	22.0	12.6	64.0	31.6	18.0	79.0	41.2	23.5
49.5	22.4	12.8	64.5	32.0	18.2	79.5	41.6	23.8
50.0	22.7	12.9	65.0	32.3	18.4	80.0	41.9	23.9
50.5	23.0	13.1	65.5	32.6	18.6	80.5	42.2	24.1
51.0	23.3	13.3	66.0	32.9	18.8	81.0	42.5	24.3
51.5	23.7	13.5	66.5	33.3	19.0	81.5	42.9	24.5
52.0	24.0	13.7	67.0	33.6	19.2	82.0	43.2	24.7
52.5	24.4	13.9	67.5	33.9	19.4	82.5	43.5	24.8
53.0	24.6	14.0	68.0	34.0	19.5	83.0	43.8	25.0
53.5	24.9	14.2	68.5	34.5	19.7	83.5	44.1	25.2
54.0	25.2	14.4	69.0	34.8	19.9	84.0	44.4	25.4
54.5	25.6	14.6	69.5	35.2	20.1	84.5	44.8	25.6