

Correction Table for an Alcoholometer Calibrated at 20°C

Draft 1 by Geoff Redman

An alcoholometer is a device that measures the concentration of ethanol in a water-ethanol mixture (often in units of %abv – percent alcohol by volume). The depth to which an alcoholometer sinks in a water-ethanol mixture is related to the mass density of the mixture, but the device is calibrated to indicate the concentration of ethanol at some fixed temperature. The density of a water-ethanol mixture varies with the temperature as well as the concentration of ethanol; therefore, a correction table is required if one wants to measure the concentration of ethanol at a temperature other than the one at which the alcoholometer was calibrated.

Here is a brief description of how, based on data tables, I calculated a correction table for an alcoholometer calibrated at 20°C (°C – degrees Celsius). One data table relates the concentration of ethanol in %abv (0 to 100 in steps of 1) to the density in g/cm³ (to 4 decimal places) for a temperature of 20°C.^[1] I fit 6th degree polynomials to obtain both the density as a function of concentration and the concentration as a function of density. A second data table shows how the volume of a water-ethanol mixture changes with temperature in °C (0 to 50 in steps of 5) and the concentration of ethanol in %abv (0 to 100 in 17 uneven steps).^[2] I linearized the data in the second data table to "fill in the gaps" and show the fractional volume change for temperature in °C (0 to 50 in steps of 1) and the concentration of ethanol in %abv (0 to 100 in steps of 1). For each mixture temperature in °C (i.e., 0 to 50 in steps of 1), each ethanol concentration - in %abv and corrected to 20°C - (i.e., 0 to 100 in steps of 1) was converted to a corresponding density at 20°C. Next, the density of each concentration was volume corrected to reflect the 'actual' mixture temperature, on the basis that the density varies inversely with the fractional volume change. Then, this corrected density was converted back to the ethanol concentration that would be measured with the device. Note that I have ignored temperature effects on the alcoholometer material.

How to use the correction table:

The correction table can be used as follows: under the column corresponding to the mixture temperature, find the measured value of the ethanol concentration and read the actual concentration in %abv in the left column of the same row.

Some definitions and equations used in the calculation of the correction table:

C	is the ethanol concentration in %abv at 20°C,
ρ	is the mass density of the water-ethanol mixture at 20°C with an ethanol concentration C ,
C_M	is the measured ethanol concentration in %abv at temperature T ,
ρ_M	is the mass density of the water-ethanol mixture at temperature T with a measured ethanol concentration C_M ,
v	is the fractional change in volume of the water-ethanol mixture at temperature T and an ethanol concentration C at 20°C,

- 1) Begin with a matrix $C_{i,j}$ where j is the index of temperature T (i.e., columns correspond to temperature in °C from 0 to 50 in steps of 1) and i is the index of concentration (i.e., rows correspond to ethanol concentration in %abv at 20°C from 0 to 100 in steps of 1). Note that each column vector in this matrix is equal.
- 2) The matrix $\rho_{i,j}$ is found by the function $\rho = \rho(C_{i,j})$ obtained by a 6th order polynomial fit of tabular data gained from experiment.
- 3) The density matrix $\rho_{Mi,j}$ at temperature T can be predicted by $\rho_{Mi,j} = \rho_{i,j} / (1 + v_{i,j})$, where v was obtained by the linearization of experimental data over the range of interest. See the derivation below.

$$\Delta\rho = \rho_M - \rho = m (1/V_M - 1/V)$$

$$= m (V - V_M) / (VV_M),$$
note that $V_M = (1 + v) V$,
so then $\Delta\rho = -(m/V) v / (1 + v) = -\rho v / (1 + v)$,
and therefore $\rho_M = \rho - \rho v / (1 + v) = \rho / (1 + v)$.
 Note that densities outside of the range of ρ are ignored.
- 4) The matrix $C_{Mi,j}$ is found by the function $C = C(\rho_{Mi,j})$ that is the inverse of the density function mentioned in step 2. Note that any concentrations outside of the range of $C_{i,j}$ are ignored.
- 5) The comparison of $C_{i,0}$ and $C_{Mi,j}$ comprises the alcoholometer correction table.

Many thanks to Mr. Zwick for supplying me with the data tables.

[1] Table 3, Tanner & Brunner, "fruit obstbrennerei today", Heller Schwabisch Hall (ISBN 3-9800 498-0-9)

[2] Table 5, *ibid*.

Correction Table for an Alcolometer Calibrated at 20°C

page 1 of 4 - Correction table for an alcolometer calibrated at 20°C (under column corresponding to mixture temperature, find measured value of ethanol concentration in %abv and read the actual concentration in the left column of the same row)

Actual C (%abv)/T (°C)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
0																					0.0	0.2	0.3	0.5	0.7	0.8
1																	0.5	0.6	0.7	0.9	1.0	1.2	1.4	1.5	1.7	1.9
2	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.9	2.0	2.2	2.4	2.5	2.7	2.9
3	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.7	1.7	1.8	1.8	1.9	2.0	2.1	2.2	2.3	2.5	2.6	2.7	2.9	3.0	3.2	3.4	3.6	3.8	3.9
4	2.5	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.7	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.5	3.6	3.7	3.9	4.0	4.2	4.4	4.6	4.8	5.0
5	3.5	3.5	3.5	3.5	3.5	3.4	3.5	3.6	3.6	3.7	3.7	3.9	4.0	4.1	4.2	4.3	4.5	4.6	4.7	4.9	5.0	5.2	5.4	5.6	5.8	6.0
6	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.5	4.6	4.6	4.7	4.8	5.0	5.1	5.2	5.3	5.5	5.6	5.7	5.9	6.0	6.2	6.4	6.6	6.8	7.0
7	5.2	5.2	5.2	5.2	5.2	5.3	5.3	5.4	5.5	5.5	5.6	5.8	5.9	6.0	6.2	6.3	6.4	6.6	6.7	6.9	7.0	7.2	7.4	7.6	7.8	8.0
8	6.1	6.1	6.1	6.1	6.1	6.1	6.2	6.3	6.4	6.4	6.5	6.7	6.8	6.9	7.1	7.2	7.4	7.5	7.7	7.8	8.0	8.2	8.4	8.6	8.9	9.1
9	6.9	6.9	6.9	6.9	6.9	6.9	7.0	7.1	7.2	7.3	7.4	7.6	7.7	7.9	8.0	8.1	8.3	8.5	8.7	8.8	9.0	9.2	9.5	9.7	9.9	10.1
10	7.7	7.7	7.7	7.7	7.8	7.8	7.9	8.0	8.1	8.2	8.3	8.5	8.6	8.8	8.9	9.1	9.2	9.4	9.6	9.8	10.0	10.2	10.5	10.7	10.9	11.2
11	8.5	8.5	8.6	8.6	8.6	8.6	8.8	8.9	9.0	9.1	9.2	9.4	9.5	9.7	9.8	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.5	11.7	12.0	12.2
12	9.3	9.4	9.4	9.4	9.5	9.5	9.6	9.7	9.9	10.0	10.1	10.3	10.5	10.6	10.8	10.9	11.1	11.3	11.6	11.8	12.0	12.3	12.5	12.8	13.0	13.3
13	10.1	10.2	10.2	10.2	10.3	10.3	10.5	10.6	10.8	10.9	11.0	11.2	11.4	11.5	11.7	11.8	12.1	12.3	12.5	12.8	13.0	13.3	13.5	13.8	14.1	14.3
14	10.9	10.9	11.0	11.1	11.1	11.2	11.3	11.5	11.6	11.8	11.9	12.1	12.3	12.4	12.6	12.8	13.0	13.3	13.5	13.8	14.0	14.3	14.6	14.8	15.1	15.4
15	11.6	11.7	11.8	11.9	11.9	12.0	12.2	12.3	12.5	12.7	12.8	13.0	13.2	13.4	13.6	13.7	14.0	14.2	14.5	14.7	15.0	15.3	15.6	15.9	16.2	16.5
16	12.4	12.5	12.6	12.7	12.8	12.9	13.0	13.2	13.4	13.5	13.7	13.9	14.1	14.3	14.5	14.7	14.9	15.2	15.5	15.7	16.0	16.3	16.6	16.9	17.2	17.5
17	13.2	13.3	13.4	13.5	13.6	13.7	13.9	14.1	14.3	14.4	14.6	14.8	15.0	15.2	15.4	15.6	15.9	16.2	16.5	16.7	17.0	17.3	17.6	18.0	18.3	18.6
18	13.9	14.1	14.2	14.3	14.4	14.6	14.8	14.9	15.1	15.3	15.5	15.7	15.9	16.1	16.4	16.6	16.9	17.2	17.4	17.7	18.0	18.3	18.7	19.0	19.3	19.7
19	14.7	14.8	15.0	15.1	15.3	15.4	15.6	15.8	16.0	16.2	16.4	16.6	16.8	17.1	17.3	17.5	17.8	18.1	18.4	18.7	19.0	19.3	19.7	20.0	20.4	20.7
20	15.4	15.5	15.7	15.9	16.0	16.2	16.4	16.6	16.8	17.0	17.3	17.5	17.7	18.0	18.2	18.5	18.8	19.1	19.4	19.7	20.0	20.3	20.7	21.0	21.4	21.7
21	16.1	16.2	16.4	16.6	16.8	17.0	17.2	17.4	17.7	17.9	18.1	18.4	18.6	18.9	19.1	19.4	19.7	20.0	20.4	20.7	21.0	21.4	21.7	22.1	22.4	22.8
22	16.7	17.0	17.2	17.4	17.6	17.8	18.0	18.3	18.5	18.8	19.0	19.3	19.5	19.8	20.1	20.3	20.7	21.0	21.3	21.7	22.0	22.4	22.7	23.1	23.4	23.8
23	17.4	17.7	17.9	18.1	18.3	18.6	18.8	19.1	19.4	19.6	19.9	20.2	20.4	20.7	21.0	21.3	21.6	22.0	22.3	22.7	23.0	23.4	23.7	24.1	24.5	24.8
24	18.2	18.4	18.6	18.9	19.1	19.4	19.7	19.9	20.2	20.5	20.8	21.1	21.4	21.6	21.9	22.2	22.6	22.9	23.3	23.6	24.0	24.4	24.7	25.1	25.5	25.8
25	18.9	19.1	19.4	19.7	19.9	20.2	20.5	20.8	21.1	21.4	21.6	22.0	22.3	22.6	22.9	23.2	23.6	23.9	24.3	24.6	25.0	25.4	25.8	26.1	26.5	26.9
26	19.6	19.9	20.2	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8	23.2	23.5	23.8	24.2	24.5	24.9	25.3	25.6	26.0	26.4	26.8	27.2	27.6	28.0
27	20.3	20.6	20.9	21.2	21.5	21.8	22.2	22.5	22.8	23.1	23.4	23.7	24.1	24.4	24.8	25.1	25.5	25.9	26.3	26.6	27.0	27.4	27.8	28.2	28.6	29.1
28	21.1	21.4	21.7	22.0	22.4	22.7	23.0	23.3	23.6	24.0	24.3	24.7	25.0	25.4	25.8	26.1	26.5	26.9	27.3	27.6	28.0	28.4	28.9	29.3	29.7	30.1
29	21.8	22.2	22.5	22.9	23.2	23.5	23.9	24.2	24.5	24.8	25.2	25.6	25.9	26.3	26.7	27.1	27.5	27.9	28.2	28.6	29.0	29.4	29.9	30.3	30.8	31.2
30	22.6	23.0	23.3	23.7	24.0	24.4	24.7	25.1	25.4	25.7	26.1	26.5	26.9	27.3	27.7	28.1	28.5	28.9	29.2	29.6	30.0	30.5	30.9	31.4	31.8	32.3
31	23.4	23.7	24.1	24.5	24.8	25.2	25.6	25.9	26.3	26.6	27.0	27.4	27.8	28.2	28.6	29.0	29.4	29.8	30.2	30.6	31.0	31.5	31.9	32.4	32.8	33.3
32	24.1	24.5	24.9	25.3	25.6	26.0	26.4	26.8	27.1	27.5	27.9	28.3	28.7	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.0	32.5	32.9	33.4	33.8	34.3
33	24.9	25.3	25.7	26.1	26.5	26.9	27.2	27.6	28.0	28.4	28.8	29.2	29.7	30.1	30.5	31.0	31.4	31.8	32.2	32.6	33.0	33.5	33.9	34.4	34.8	35.3
34	25.7	26.1	26.5	26.9	27.3	27.7	28.1	28.5	28.9	29.3	29.7	30.2	30.6	31.0	31.5	31.9	32.3	32.8	33.2	33.6	34.0	34.5	34.9	35.4	35.8	36.3
35	26.5	26.9	27.3	27.7	28.1	28.5	29.0	29.4	29.8	30.2	30.6	31.1	31.5	32.0	32.4	32.9	33.3	33.7	34.2	34.6	35.0	35.5	35.9	36.4	36.8	37.3
36	27.3	27.7	28.1	28.6	29.0	29.4	29.8	30.3	30.7	31.1	31.6	32.0	32.5	32.9	33.4	33.8	34.3	34.7	35.1	35.6	36.0	36.5	36.9	37.4	37.8	38.3
37	28.2	28.6	29.1	29.5	29.9	30.3	30.8	31.2	31.7	32.1	32.6	33.0	33.5	33.9	34.4	34.8	35.3	35.7	36.1	36.6	37.0	37.5	37.9	38.4	38.8	39.3
38	29.1	29.6	30.0	30.4	30.9	31.3	31.7	32.2	32.7	33.1	33.5	34.0	34.5	34.9	35.4	35.8	36.3	36.7	37.1	37.6	38.0	38.5	38.9	39.3	39.8	40.2
39	30.1	30.5	31.0	31.4	31.8	32.3	32.7	33.2	33.6	34.1	34.5	35.0	35.5	35.9	36.4	36.8	37.3	37.7	38.1	38.6	39.0	39.4	39.9	40.3	40.8	41.2
40	31.1	31.5	31.9	32.4	32.8	33.2	33.7	34.2	34.6	35.1	35.5	36.0	36.5	36.9	37.4	37.8	38.3	38.7	39.1	39.6	40.0	40.4	40.9	41.3	41.7	42.2
41	32.0	32.5	32.9	33.4	33.8	34.2	34.7	35.2	35.6	36.1	36.6	37.0	37.5	37.9	38.4	38.8	39.3	39.7	40.1	40.6	41.0	41.4	41.9	42.3	42.7	43.1
42	33.0	33.5	33.9	34.4	34.8	35.2	35.7	36.2	36.6	37.1	37.6	38.0	38.5	38.9	39.4	39.8	40.3	40.7	41.1	41.6	42.0	42.4	42.9	43.3	43.7	44.1
43	34.0	34.4	34.9	35.3	35.8	36.2	36.7	37.2	37.6	38.1	38.5	39.0	39.5	39.9	40.4	40.8	41.3	41.7	42.1	42.6	43.0	43.4	43.8	44.3	44.7	45.1
44	35.0	35.5	35.9	36.4	36.8	37.2	37.7	38.2	38.6	39.1	39.5	40.0	40.5	40.9	41.4	41.8	42.3	42.7	43.1	43.6	44.0	44.4	44.8	45.2	45.7	46.1
45	36.0	36.5	36.9	37.4	37.8	38.2	38.7	39.2	39.6	40.1	40.5	41.0	41.5	41.9	42.4	42.8	43.3	43.7	44.1	44.6	45.0	45.4	45.8	46.2	46.6	47.0
46	37.0	37.5	37.9	38.4	38.8	39.3	39.7	40.2	40.6	41.1	41.5	42.0	42.5	42.9	43.4	43.8	44.3	44.7	45.1	45.6	46.0	46.4	46.8	47.2	47.6	48.0
47	38.1	38.5	39.0	39.4	39.8	40.3	40.7	41.2	41.6	42.1	42.5	43.0	43.5	43.9	44.4	44.8	45.3	45.7	46.1	46.6	47.0	47.4	47.8	48.2	48.6	49.0
48	39.2	39.6	40.1	40.5	41.0	41.4	41.8	42.3	42.7	43.2	43.6	44.0	44.5	45.0	45.4	45.8	46.3	46.7	47.2	47.6	48.0	48.4	48.8	49.2	49.6	50.0
49	40.3	40.8	41.2	41.7	42.1	42.5	43.0	43.4	43.8	44.3	44.7	45.1	45.6	46.0	46.5	46.9	47.3	47.7	48.2	48.6	49.0	49.4	49.8	50.2	50.6	50.9
50	41.5	41.9	42.4	42.8	43.2	43.7	44.1	44.5	44.9	45.4	45.8	46.2	46.7	47.1	47.5	47.9	48.4	48.8</								

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page 2 of 4 - Correction table for an alcoholometer calibrated at 20°C (under column corresponding to mixture temperature, find measured value of ethanol concentration in %abv and read the actual concentration in the left column of the same row)

Actual C (%abv)/T (°C)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
51	42.6	43.1	43.5	44.0	44.4	44.8	45.2	45.6	46.1	46.5	46.9	47.3	47.7	48.1	48.6	49.0	49.4	49.8	50.2	50.6	51.0	51.4	51.8	52.2	52.5	52.9
52	43.8	44.2	44.7	45.1	45.5	45.9	46.4	46.8	47.2	47.6	48.0	48.4	48.8	49.2	49.6	50.0	50.4	50.8	51.2	51.6	52.0	52.4	52.8	53.1	53.5	53.9
53	44.9	45.4	45.8	46.2	46.6	47.1	47.5	47.9	48.3	48.6	49.0	49.4	49.9	50.3	50.7	51.1	51.5	51.9	52.2	52.6	53.0	53.4	53.8	54.1	54.5	54.9
54	46.1	46.5	46.9	47.3	47.7	48.1	48.5	48.9	49.3	49.7	50.1	50.5	50.9	51.3	51.7	52.1	52.5	52.9	53.2	53.6	54.0	54.4	54.7	55.1	55.5	55.8
55	47.2	47.6	48.0	48.4	48.8	49.2	49.6	50.0	50.4	50.8	51.1	51.5	51.9	52.3	52.7	53.1	53.5	53.9	54.2	54.6	55.0	55.4	55.7	56.1	56.4	56.8
56	48.3	48.7	49.1	49.5	49.9	50.3	50.7	51.1	51.4	51.8	52.2	52.6	53.0	53.3	53.7	54.1	54.5	54.9	55.3	55.6	56.0	56.4	56.7	57.1	57.4	57.8
57	49.4	49.8	50.2	50.6	51.0	51.4	51.8	52.1	52.5	52.8	53.2	53.6	54.0	54.4	54.7	55.1	55.5	55.9	56.3	56.6	57.0	57.4	57.7	58.1	58.4	58.7
58	50.5	50.9	51.3	51.7	52.1	52.5	52.8	53.2	53.5	53.9	54.2	54.6	55.0	55.4	55.8	56.1	56.5	56.9	57.3	57.6	58.0	58.3	58.7	59.0	59.4	59.7
59	51.7	52.1	52.4	52.8	53.2	53.6	53.9	54.3	54.6	55.0	55.3	55.7	56.1	56.4	56.8	57.2	57.5	57.9	58.3	58.6	59.0	59.3	59.7	60.0	60.4	60.7
60	52.8	53.2	53.6	53.9	54.3	54.7	55.0	55.4	55.7	56.1	56.4	56.8	57.1	57.5	57.9	58.2	58.6	58.9	59.3	59.6	60.0	60.3	60.7	61.0	61.4	61.7
61	53.9	54.3	54.7	55.1	55.4	55.8	56.1	56.5	56.8	57.1	57.4	57.8	58.2	58.5	58.9	59.3	59.6	60.0	60.3	60.7	61.0	61.3	61.7	62.0	62.4	62.7
62	55.1	55.4	55.8	56.2	56.5	56.9	57.2	57.5	57.9	58.2	58.5	58.9	59.2	59.6	59.9	60.3	60.6	61.0	61.3	61.7	62.0	62.3	62.7	63.0	63.4	63.7
63	56.2	56.5	56.9	57.2	57.6	57.9	58.3	58.6	58.9	59.2	59.5	59.9	60.3	60.6	61.0	61.3	61.7	62.0	62.3	62.7	63.0	63.3	63.7	64.0	64.3	64.7
64	57.2	57.6	57.9	58.3	58.6	59.0	59.3	59.6	59.9	60.3	60.6	60.9	61.3	61.6	62.0	62.3	62.7	63.0	63.3	63.7	64.0	64.3	64.7	65.0	65.3	65.7
65	58.2	58.6	58.9	59.3	59.6	60.0	60.3	60.6	61.0	61.3	61.6	62.0	62.3	62.7	63.0	63.3	63.7	64.0	64.3	64.7	65.0	65.3	65.7	66.0	66.3	66.7
66	59.3	59.6	60.0	60.3	60.7	61.0	61.3	61.7	62.0	62.3	62.6	63.0	63.3	63.7	64.0	64.3	64.7	65.0	65.3	65.7	66.0	66.3	66.7	67.0	67.4	67.7
67	60.3	60.6	61.0	61.3	61.7	62.0	62.3	62.7	63.0	63.3	63.7	64.0	64.3	64.7	65.0	65.3	65.7	66.0	66.3	66.7	67.0	67.3	67.7	68.0	68.4	68.7
68	61.3	61.6	62.0	62.3	62.7	63.0	63.3	63.7	64.0	64.3	64.7	65.0	65.4	65.7	66.0	66.4	66.7	67.0	67.3	67.7	68.0	68.3	68.7	69.0	69.4	69.7
69	62.3	62.7	63.0	63.3	63.7	64.0	64.4	64.7	65.0	65.4	65.7	66.0	66.4	66.7	67.0	67.4	67.7	68.0	68.3	68.7	69.0	69.3	69.7	70.0	70.4	70.7
70	63.3	63.7	64.0	64.4	64.7	65.0	65.4	65.7	66.0	66.4	66.7	67.0	67.4	67.7	68.0	68.4	68.7	69.0	69.3	69.7	70.0	70.3	70.7	71.0	71.4	71.7
71	64.3	64.7	65.0	65.4	65.7	66.0	66.4	66.7	67.0	67.4	67.7	68.0	68.4	68.7	69.0	69.4	69.7	70.0	70.3	70.7	71.0	71.3	71.7	72.0	72.4	72.7
72	65.4	65.7	66.0	66.4	66.7	67.0	67.4	67.7	68.0	68.4	68.7	69.0	69.4	69.7	70.0	70.4	70.7	71.0	71.3	71.7	72.0	72.3	72.7	73.0	73.4	73.7
73	66.4	66.7	67.0	67.4	67.7	68.0	68.4	68.7	69.0	69.4	69.7	70.0	70.3	70.7	71.0	71.3	71.7	72.0	72.3	72.7	73.0	73.3	73.7	74.0	74.4	74.7
74	67.3	67.7	68.0	68.4	68.7	69.0	69.4	69.7	70.0	70.3	70.7	71.0	71.3	71.7	72.0	72.3	72.7	73.0	73.3	73.7	74.0	74.4	74.7	75.0	75.4	75.7
75	68.3	68.7	69.0	69.4	69.7	70.0	70.4	70.7	71.0	71.3	71.7	72.0	72.3	72.7	73.0	73.3	73.7	74.0	74.3	74.7	75.0	75.4	75.7	76.1	76.4	76.7
76	69.3	69.7	70.0	70.4	70.7	71.0	71.4	71.7	72.0	72.3	72.7	73.0	73.3	73.7	74.0	74.3	74.7	75.0	75.3	75.7	76.0	76.4	76.7	77.1	77.4	77.7
77	70.3	70.7	71.0	71.4	71.7	72.0	72.4	72.7	73.0	73.3	73.7	74.0	74.3	74.7	75.0	75.3	75.7	76.0	76.3	76.7	77.0	77.4	77.7	78.1	78.4	78.7
78	71.3	71.7	72.0	72.3	72.7	73.0	73.3	73.7	74.0	74.3	74.6	75.0	75.3	75.7	76.0	76.3	76.7	77.0	77.3	77.7	78.0	78.3	78.7	79.0	79.4	79.7
79	72.3	72.7	73.0	73.3	73.7	74.0	74.3	74.7	75.0	75.3	75.6	76.0	76.3	76.7	77.0	77.3	77.7	78.0	78.3	78.7	79.0	79.3	79.7	80.0	80.4	80.7
80	73.3	73.7	74.0	74.3	74.7	75.0	75.4	75.7	76.0	76.3	76.6	77.0	77.3	77.7	78.0	78.3	78.7	79.0	79.3	79.7	80.0	80.3	80.7	81.0	81.3	81.7
81	74.3	74.7	75.0	75.4	75.7	76.0	76.4	76.7	77.0	77.3	77.6	78.0	78.3	78.7	79.0	79.3	79.7	80.0	80.3	80.7	81.0	81.3	81.7	82.0	82.3	82.6
82	75.4	75.7	76.1	76.4	76.7	77.1	77.4	77.7	78.0	78.3	78.7	79.0	79.3	79.7	80.0	80.3	80.7	81.0	81.3	81.7	82.0	82.3	82.7	83.0	83.3	83.6
83	76.4	76.8	77.1	77.4	77.8	78.1	78.4	78.8	79.1	79.4	79.7	80.0	80.4	80.7	81.0	81.4	81.7	82.0	82.4	82.7	83.0	83.3	83.6	83.9	84.3	84.6
84	77.5	77.8	78.2	78.5	78.8	79.2	79.5	79.8	80.1	80.4	80.7	81.1	81.4	81.7	82.1	82.4	82.7	83.0	83.4	83.7	84.0	84.3	84.6	84.9	85.2	85.5
85	78.6	78.9	79.3	79.6	79.9	80.2	80.6	80.9	81.2	81.5	81.8	82.1	82.4	82.8	83.1	83.4	83.7	84.1	84.4	84.7	85.0	85.3	85.6	85.9	86.2	86.5
86	79.7	80.0	80.4	80.7	81.0	81.4	81.7	82.0	82.3	82.6	82.8	83.2	83.5	83.8	84.1	84.5	84.8	85.1	85.4	85.7	86.0	86.3	86.6	86.9	87.1	87.4
87	80.9	81.2	81.5	81.8	82.2	82.5	82.8	83.1	83.4	83.7	83.9	84.3	84.6	84.9	85.2	85.5	85.8	86.1	86.4	86.7	87.0	87.3	87.6	87.8	88.1	88.4
88	82.1	82.4	82.7	83.0	83.3	83.7	83.9	84.2	84.5	84.8	85.1	85.4	85.7	86.0	86.3	86.6	86.9	87.2	87.4	87.7	88.0	88.3	88.5	88.8	89.1	89.3
89	83.3	83.6	83.9	84.2	84.5	84.8	85.1	85.4	85.6	85.9	86.2	86.5	86.8	87.1	87.4	87.6	87.9	88.2	88.5	88.7	89.0	89.3	89.5	89.8	90.0	90.3
90	84.5	84.8	85.1	85.4	85.7	86.0	86.3	86.5	86.8	87.1	87.3	87.6	87.9	88.2	88.4	88.7	89.0	89.2	89.5	89.8	90.0	90.2	90.5	90.7	91.0	91.2
91	85.7	86.0	86.3	86.6	86.9	87.2	87.4	87.7	88.0	88.2	88.4	88.7	89.0	89.3	89.5	89.8	90.0	90.3	90.5	90.8	91.0	91.2	91.5	91.7	91.9	92.2
92	87.0	87.3	87.6	87.8	88.1	88.4	88.6	88.9	89.1	89.4	89.6	89.8	90.1	90.4	90.6	90.9	91.1	91.3	91.6	91.8	92.0	92.2	92.4	92.7	92.9	93.1
93	88.2	88.5	88.8	89.1	89.3	89.6	89.8	90.0	90.3	90.5	90.7	91.0	91.2	91.4	91.7	91.9	92.1	92.4	92.6	92.8	93.0	93.2	93.4	93.6	93.8	94.1
94	89.5	89.7	90.0	90.2	90.5	90.7	91.0	91.2	91.4	91.6	91.8	92.1	92.3	92.5	92.7	93.0	93.2	93.4	93.6	93.8	94.0	94.2	94.4	94.6	94.8	95.0
95	90.7	90.9	91.2	91.4	91.6	91.9	92.1	92.3	92.5	92.7	92.9	93.1	93.3	93.6	93.8	94.0	94.2	94.4	94.6	94.8	95.0	95.2	95.4	95.6	95.8	96.0
96	91.8	92.1	92.3	92.5	92.7	93.0	93.2	93.4	93.6	93.8	93.9	94.2	94.4	94.6	94.8	95.0	95.2	95.4	95.6	95.8	96.0	96.2	96.4	96.6	96.8	97.0
97	92.9	93.1	93.3	93.6	93.8	94.0	94.2	94.4	94.6	94.8	94.9	95.2	95.4	95.6	95.8	96.0	96.2	96.4	96.6	96.8	97.0	97.2	97.4	97.6	97.9	98.1
98	93.9	94.1	94.3	94.5	94.7	94.9	95.1	95.3	95.5	95.7	95.9	96.1	96.3	96.5	96.7	96.9	97.1	97.3	97.6	97.8	98.0	98.2	98.5	98.7	99.0	99.2
99	94.7	94.9	95.1	95.3	95.5	95.7	95.9	96.1	96.3	96.5	96.7	96.9	97.1	97.3	97.5	97.8	98.0	98.2	98.5	98.7	99.0	99.3				

Correction Table for an Alcoholometer Calibrated at 20°C

page 3 of 4 - Correction table for an alcoholometer calibrated at 20°C (under column corresponding to mixture temperature, find measured value of ethanol concentration in %abv and read the actual concentration in the left column of the same row)

Actual C (%abv)/T (°C)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
0	1.1	1.3	1.5	1.7	1.9	2.1	2.4	2.6	2.8	3.1	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.6	5.9	6.2	6.5	6.9	7.2	7.6	7.9
1	2.1	2.3	2.5	2.8	3.0	3.2	3.5	3.7	4.0	4.2	4.5	4.8	5.1	5.4	5.7	6.1	6.4	6.8	7.1	7.4	7.8	8.1	8.5	8.8	9.2
2	3.1	3.4	3.6	3.8	4.1	4.3	4.6	4.8	5.1	5.4	5.7	6.0	6.3	6.6	6.9	7.3	7.6	8.0	8.3	8.7	9.0	9.4	9.7	10.1	10.4
3	4.2	4.4	4.7	4.9	5.1	5.4	5.7	5.9	6.2	6.5	6.8	7.1	7.4	7.7	8.0	8.4	8.8	9.1	9.5	9.8	10.2	10.5	10.9	11.3	11.6
4	5.2	5.5	5.7	6.0	6.2	6.5	6.8	7.0	7.3	7.6	7.9	8.2	8.5	8.9	9.2	9.5	9.9	10.3	10.6	11.0	11.3	11.7	12.1	12.4	12.8
5	6.2	6.5	6.7	7.0	7.3	7.5	7.8	8.1	8.4	8.7	9.0	9.3	9.6	10.0	10.3	10.6	11.0	11.4	11.8	12.1	12.5	12.9	13.2	13.6	14.0
6	7.3	7.5	7.8	8.1	8.3	8.6	8.9	9.2	9.5	9.8	10.1	10.4	10.7	11.0	11.4	11.7	12.1	12.5	12.9	13.2	13.6	14.0	14.4	14.7	15.1
7	8.3	8.6	8.8	9.1	9.4	9.7	10.0	10.3	10.6	10.9	11.2	11.5	11.9	12.2	12.5	12.9	13.3	13.7	14.0	14.4	14.8	15.2	15.6	15.9	16.3
8	9.4	9.6	9.9	10.2	10.5	10.8	11.1	11.4	11.7	12.0	12.3	12.7	13.0	13.3	13.7	14.1	14.5	14.9	15.2	15.6	16.0	16.4	16.8	17.2	17.6
9	10.4	10.7	11.0	11.3	11.5	11.8	12.2	12.5	12.8	13.1	13.4	13.8	14.1	14.5	14.8	15.2	15.6	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8
10	11.5	11.8	12.0	12.3	12.6	12.9	13.2	13.5	13.9	14.2	14.5	14.9	15.3	15.6	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.2	19.6	20.0
11	12.5	12.8	13.1	13.4	13.7	14.0	14.3	14.6	14.9	15.3	15.6	16.0	16.4	16.8	17.1	17.5	18.0	18.4	18.8	19.2	19.6	20.0	20.4	20.8	21.2
12	13.6	13.9	14.1	14.4	14.7	15.0	15.4	15.7	16.0	16.3	16.7	17.1	17.5	17.9	18.3	18.7	19.1	19.5	19.9	20.3	20.7	21.2	21.6	22.0	22.4
13	14.6	14.9	15.2	15.5	15.8	16.2	16.5	16.8	17.1	17.5	17.9	18.2	18.6	19.0	19.4	19.8	20.2	20.7	21.1	21.5	21.9	22.3	22.7	23.2	23.6
14	15.7	16.0	16.3	16.6	17.0	17.3	17.6	18.0	18.3	18.6	19.0	19.4	19.8	20.2	20.6	21.0	21.4	21.8	22.3	22.7	23.1	23.5	23.9	24.4	24.8
15	16.8	17.1	17.4	17.8	18.1	18.4	18.8	19.1	19.4	19.8	20.1	20.5	20.9	21.3	21.7	22.1	22.6	23.0	23.4	23.9	24.3	24.7	25.1	25.5	26.0
16	17.9	18.2	18.5	18.9	19.2	19.6	19.9	20.2	20.6	20.9	21.3	21.7	22.1	22.4	22.8	23.3	23.7	24.1	24.6	25.0	25.4	25.9	26.3	26.7	27.1
17	18.9	19.3	19.6	20.0	20.3	20.7	21.0	21.4	21.7	22.0	22.4	22.8	23.2	23.6	24.0	24.4	24.8	25.3	25.7	26.2	26.6	27.0	27.4	27.9	28.3
18	20.0	20.4	20.7	21.1	21.4	21.8	22.1	22.5	22.8	23.2	23.5	23.9	24.3	24.7	25.1	25.5	26.0	26.4	26.9	27.3	27.7	28.2	28.6	29.0	29.4
19	21.1	21.4	21.8	22.2	22.5	22.9	23.2	23.6	23.9	24.3	24.7	25.1	25.4	25.8	26.2	26.7	27.1	27.6	28.0	28.4	28.9	29.3	29.7	30.2	30.6
20	22.1	22.5	22.9	23.2	23.6	24.0	24.3	24.7	25.0	25.4	25.8	26.2	26.6	27.0	27.3	27.8	28.2	28.7	29.1	29.6	30.0	30.4	30.8	31.3	31.7
21	23.1	23.5	23.9	24.3	24.7	25.1	25.4	25.8	26.2	26.5	26.9	27.3	27.7	28.1	28.5	29.0	29.4	29.9	30.3	30.8	31.2	31.6	32.1	32.5	32.9
22	24.2	24.6	25.0	25.4	25.7	26.1	26.5	26.9	27.3	27.7	28.1	28.5	28.9	29.3	29.7	30.1	30.6	31.0	31.5	31.9	32.3	32.8	33.2	33.6	34.0
23	25.2	25.6	26.0	26.4	26.8	27.2	27.6	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.7	32.1	32.6	33.0	33.5	33.9	34.3	34.7	35.2
24	26.2	26.6	27.0	27.5	27.8	28.3	28.7	29.1	29.5	29.9	30.3	30.7	31.1	31.5	31.9	32.4	32.8	33.3	33.7	34.1	34.6	35.0	35.4	35.9	36.3
25	27.3	27.7	28.1	28.5	28.9	29.3	29.8	30.2	30.6	31.0	31.4	31.8	32.2	32.6	33.0	33.5	34.0	34.4	34.8	35.3	35.7	36.1	36.6	37.0	37.4
26	28.4	28.8	29.2	29.6	30.0	30.5	30.9	31.3	31.7	32.1	32.5	32.9	33.4	33.8	34.2	34.7	35.1	35.5	36.0	36.4	36.9	37.3	37.7	38.1	38.5
27	29.5	29.9	30.3	30.7	31.1	31.6	32.0	32.4	32.8	33.2	33.6	34.1	34.5	34.9	35.3	35.8	36.2	36.7	37.1	37.5	38.0	38.4	38.8	39.2	39.6
28	30.6	31.0	31.4	31.8	32.2	32.6	33.1	33.5	33.9	34.3	34.7	35.2	35.6	36.0	36.5	36.9	37.4	37.8	38.2	38.7	39.1	39.5	39.9	40.3	40.7
29	31.6	32.1	32.5	32.9	33.3	33.7	34.1	34.5	34.9	35.3	35.8	36.2	36.7	37.1	37.6	38.0	38.5	38.9	39.3	39.8	40.2	40.6	41.0	41.4	41.8
30	32.7	33.1	33.6	34.0	34.4	34.8	35.2	35.6	36.0	36.4	36.9	37.3	37.8	38.2	38.7	39.1	39.6	40.0	40.4	40.8	41.3	41.7	42.1	42.5	42.9
31	33.7	34.2	34.6	35.0	35.5	35.9	36.3	36.7	37.1	37.5	37.9	38.4	38.8	39.3	39.7	40.2	40.6	41.0	41.5	41.9	42.3	42.7	43.1	43.5	43.9
32	34.7	35.2	35.6	36.0	36.5	36.9	37.3	37.7	38.1	38.5	39.0	39.4	39.9	40.3	40.8	41.2	41.6	42.1	42.5	42.9	43.3	43.7	44.1	44.5	44.9
33	35.7	36.2	36.6	37.1	37.5	37.9	38.3	38.8	39.2	39.6	40.0	40.5	40.9	41.3	41.8	42.2	42.6	43.1	43.5	43.9	44.3	44.7	45.1	45.5	45.9
34	36.7	37.2	37.6	38.1	38.5	38.9	39.4	39.8	40.2	40.6	41.1	41.5	41.9	42.3	42.8	43.2	43.6	44.1	44.5	44.9	45.3	45.7	46.1	46.5	46.9
35	37.7	38.2	38.6	39.1	39.5	39.9	40.4	40.8	41.2	41.6	42.1	42.5	42.9	43.3	43.7	44.2	44.6	45.0	45.5	45.9	46.3	46.7	47.1	47.5	47.9
36	38.7	39.2	39.6	40.1	40.5	40.9	41.4	41.8	42.2	42.7	43.1	43.5	43.9	44.3	44.7	45.2	45.6	46.0	46.4	46.9	47.3	47.7	48.1	48.5	48.9
37	39.7	40.2	40.6	41.0	41.5	41.9	42.4	42.8	43.2	43.7	44.1	44.5	44.9	45.3	45.7	46.1	46.6	47.0	47.4	47.8	48.2	48.6	49.0	49.4	49.8
38	40.7	41.1	41.6	42.0	42.5	42.9	43.3	43.8	44.2	44.6	45.1	45.5	45.9	46.3	46.7	47.1	47.5	47.9	48.3	48.7	49.1	49.5	49.9	50.3	50.7
39	41.7	42.1	42.5	43.0	43.4	43.9	44.3	44.7	45.2	45.6	46.0	46.4	46.8	47.2	47.6	48.0	48.4	48.9	49.3	49.7	50.1	50.4	50.8	51.2	51.6
40	42.6	43.1	43.5	44.0	44.4	44.8	45.3	45.7	46.1	46.6	47.0	47.4	47.8	48.2	48.6	49.0	49.4	49.8	50.2	50.6	51.0	51.4	51.7	52.1	52.5
41	43.6	44.0	44.5	44.9	45.3	45.8	46.2	46.7	47.1	47.5	47.9	48.3	48.7	49.1	49.5	49.9	50.3	50.7	51.1	51.5	51.9	52.3	52.6	53.0	53.4
42	44.6	45.0	45.4	45.9	46.3	46.8	47.2	47.6	48.1	48.5	48.9	49.3	49.7	50.1	50.4	50.8	51.2	51.6	52.0	52.4	52.8	53.2	53.5	53.9	54.3
43	45.5	46.0	46.4	46.8	47.2	47.7	48.1	48.5	49.0	49.4	49.8	50.2	50.5	50.9	51.3	51.7	52.1	52.5	52.9	53.2	53.6	54.0	54.4	54.7	55.1
44	46.5	46.9	47.3	47.8	48.2	48.6	49.0	49.4	49.8	50.2	50.6	51.0	51.4	51.8	52.2	52.5	52.9	53.3	53.7	54.1	54.4	54.8	55.2	55.5	55.9
45	47.4	47.9	48.3	48.7	49.1	49.5	49.9	50.3	50.7	51.1	51.5	51.9	52.3	52.6	53.0	53.4	53.8	54.2	54.5	54.9	55.3	55.6	56.0	56.4	56.7
46	48.4	48.8	49.2	49.6	50.0	50.4	50.8	51.2	51.6	52.0	52.4	52.8	53.1	53.5	53.9	54.3	54.6	55.0	55.4	55.8	56.1	56.5	56.8	57.2	57.5
47	49.4	49.8	50.2	50.6	50.9	51.3	51.7	52.1	52.5	52.9	53.3	53.7	54.0	54.4	54.8	55.1	55.5	55.9	56.2	56.6	57.0	57.3	57.7	58.0	58.4
48	50.4	50.7	51.1	51.5	51.9	52.3	52.7	53.1	53.4	53.8	54.2	54.6	54.9	55.3	55.6	56.0	56.4	56.8	57.1	57.5	57.8	58.2	58.5	58.9	59.2
49	51.3	51.7	52.1	52.5	52.9	53.2	53.6	54.0	54.4	54.7	55.1	55.5	55.8	56.2	56.6	56.9	57.3	57.7	58.0	58.4	58.7	59.1	59.4	59.8	60.1
50	52.3	52.7	53.1	53.5	53.8	54.2	54.6	54.9	55.3	55.7	56.0	56.4	56.8	57.1	57.5	57.8	58.2	58.6	58.9	59.3	59.6	60.0	60.3	60.7	61.0

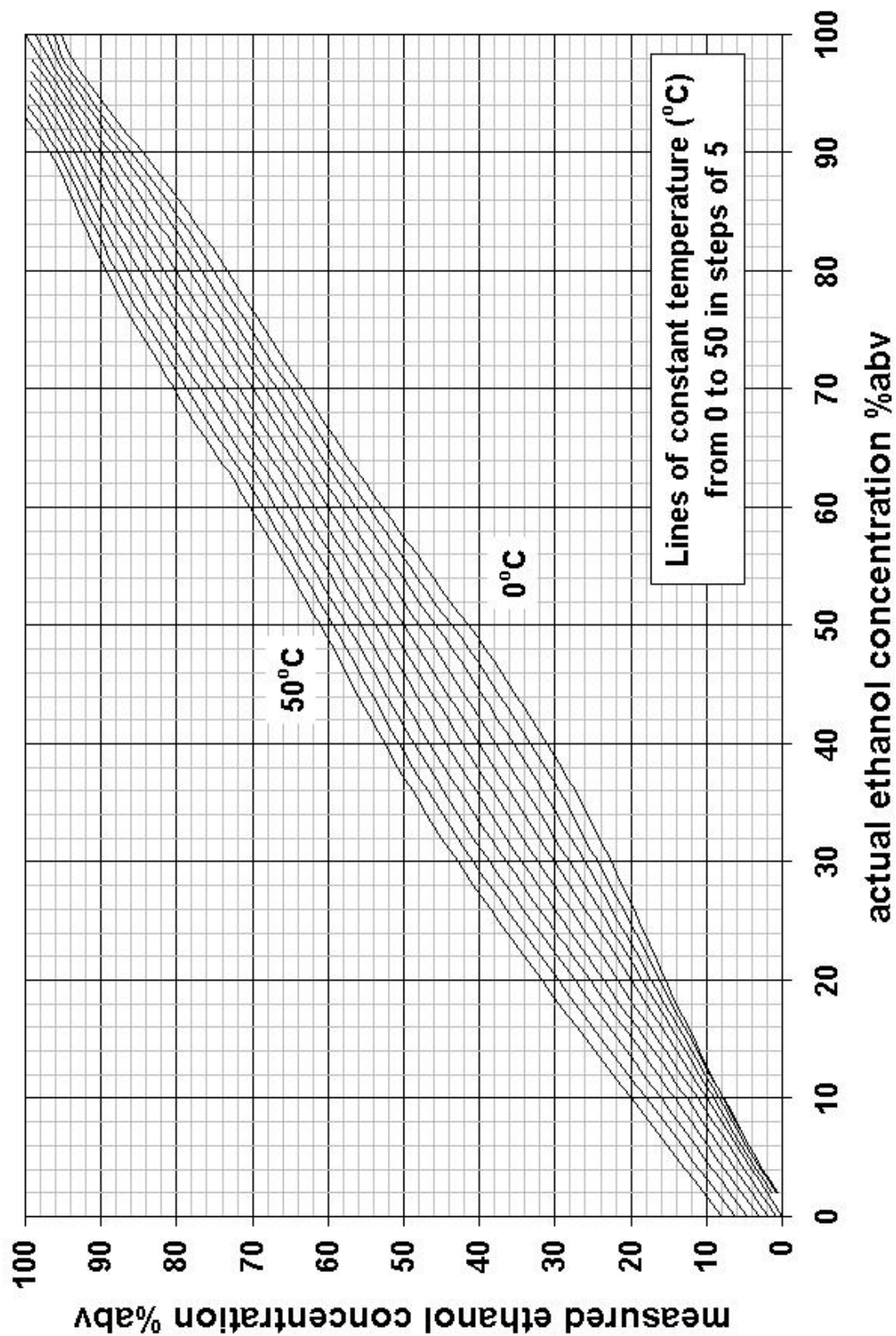
Correction Table for an Alcoholometer Calibrated at 20°C

page 4 of 4 - Correction table for an alcoholometer calibrated at 20°C (under column corresponding to mixture temperature, find measured value of ethanol concentration in %abv and read the actual concentration in the left column of the same row)

Actual C (%abv)/T (°C)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
51	53.3	53.7	54.1	54.4	54.8	55.2	55.5	55.9	56.3	56.6	57.0	57.3	57.7	58.1	58.4	58.8	59.1	59.5	59.8	60.2	60.5	60.9	61.2	61.6	61.9
52	54.3	54.7	55.0	55.4	55.8	56.1	56.5	56.8	57.2	57.5	57.9	58.3	58.6	59.0	59.3	59.7	60.1	60.4	60.8	61.1	61.4	61.8	62.1	62.5	62.8
53	55.3	55.6	56.0	56.4	56.7	57.1	57.4	57.8	58.1	58.5	58.9	59.2	59.6	59.9	60.3	60.6	61.0	61.3	61.7	62.0	62.4	62.7	63.0	63.4	63.7
54	56.2	56.6	57.0	57.3	57.7	58.0	58.4	58.7	59.1	59.4	59.8	60.1	60.5	60.9	61.2	61.6	61.9	62.2	62.6	62.9	63.3	63.6	63.9	64.3	64.6
55	57.2	57.5	57.9	58.3	58.6	59.0	59.3	59.7	60.0	60.4	60.7	61.1	61.4	61.8	62.1	62.5	62.8	63.2	63.5	63.8	64.2	64.5	64.9	65.2	65.5
56	58.1	58.5	58.9	59.2	59.6	60.0	60.3	60.6	61.0	61.3	61.7	62.0	62.4	62.7	63.1	63.4	63.8	64.1	64.4	64.8	65.1	65.5	65.8	66.1	66.5
57	59.1	59.5	59.8	60.2	60.6	60.9	61.3	61.6	62.0	62.3	62.6	63.0	63.3	63.7	64.0	64.4	64.7	65.1	65.4	65.7	66.1	66.4	66.7	67.1	67.4
58	60.1	60.5	60.8	61.2	61.5	61.9	62.2	62.6	62.9	63.3	63.6	64.0	64.3	64.6	65.0	65.3	65.7	66.0	66.3	66.7	67.0	67.4	67.7	68.0	68.4
59	61.1	61.4	61.8	62.1	62.5	62.8	63.2	63.5	63.9	64.2	64.6	64.9	65.2	65.6	65.9	66.3	66.6	66.9	67.3	67.6	68.0	68.3	68.6	69.0	69.3
60	62.1	62.4	62.8	63.1	63.4	63.8	64.1	64.5	64.8	65.2	65.5	65.9	66.2	66.5	66.9	67.2	67.5	67.9	68.2	68.6	68.9	69.2	69.6	69.9	70.3
61	63.0	63.4	63.7	64.1	64.4	64.8	65.1	65.5	65.8	66.2	66.5	66.8	67.2	67.5	67.8	68.2	68.5	68.9	69.2	69.5	69.9	70.2	70.5	70.9	71.2
62	64.0	64.4	64.7	65.0	65.4	65.7	66.1	66.4	66.8	67.1	67.5	67.8	68.1	68.5	68.8	69.1	69.5	69.8	70.2	70.5	70.8	71.2	71.5	71.9	72.2
63	65.0	65.4	65.7	66.0	66.4	66.7	67.1	67.4	67.8	68.1	68.5	68.8	69.1	69.4	69.8	70.1	70.5	70.8	71.1	71.5	71.8	72.2	72.5	72.8	73.2
64	66.0	66.4	66.7	67.0	67.4	67.7	68.1	68.4	68.8	69.1	69.5	69.8	70.1	70.5	70.8	71.1	71.5	71.8	72.2	72.5	72.9	73.2	73.6	73.9	74.2
65	67.0	67.4	67.7	68.0	68.4	68.7	69.1	69.4	69.8	70.1	70.5	70.8	71.1	71.5	71.8	72.2	72.5	72.9	73.2	73.6	73.9	74.3	74.6	75.0	75.3
66	68.0	68.4	68.7	69.0	69.4	69.7	70.1	70.4	70.8	71.1	71.5	71.8	72.2	72.5	72.8	73.2	73.6	73.9	74.3	74.6	75.0	75.3	75.7	76.0	76.4
67	69.0	69.4	69.7	70.1	70.4	70.7	71.1	71.4	71.8	72.1	72.5	72.8	73.2	73.5	73.9	74.2	74.6	75.0	75.3	75.7	76.0	76.4	76.7	77.1	77.4
68	70.0	70.4	70.7	71.1	71.4	71.8	72.1	72.4	72.8	73.1	73.5	73.8	74.2	74.5	74.9	75.3	75.6	76.0	76.3	76.7	77.0	77.4	77.8	78.1	78.4
69	71.0	71.4	71.7	72.1	72.4	72.8	73.1	73.4	73.8	74.1	74.5	74.8	75.2	75.5	75.9	76.2	76.6	77.0	77.3	77.7	78.0	78.4	78.7	79.0	79.4
70	72.1	72.4	72.7	73.1	73.4	73.8	74.1	74.4	74.8	75.1	75.5	75.8	76.2	76.5	76.9	77.2	77.6	77.9	78.3	78.6	79.0	79.3	79.6	80.0	80.3
71	73.1	73.4	73.7	74.1	74.4	74.8	75.1	75.4	75.8	76.1	76.5	76.8	77.2	77.5	77.8	78.2	78.5	78.9	79.2	79.6	79.9	80.2	80.6	80.9	81.3
72	74.1	74.4	74.7	75.1	75.4	75.8	76.1	76.4	76.8	77.1	77.5	77.8	78.1	78.5	78.8	79.2	79.5	79.8	80.2	80.5	80.9	81.2	81.5	81.8	82.2
73	75.1	75.4	75.7	76.1	76.4	76.8	77.1	77.4	77.8	78.1	78.5	78.8	79.1	79.5	79.8	80.2	80.5	80.8	81.2	81.5	81.8	82.2	82.5	82.8	83.1
74	76.1	76.4	76.7	77.1	77.4	77.8	78.1	78.4	78.8	79.1	79.5	79.8	80.2	80.5	80.8	81.2	81.5	81.8	82.2	82.5	82.8	83.2	83.5	83.8	84.1
75	77.1	77.4	77.7	78.1	78.4	78.8	79.1	79.4	79.8	80.1	80.5	80.8	81.2	81.5	81.8	82.2	82.5	82.8	83.2	83.5	83.8	84.1	84.4	84.8	85.1
76	78.1	78.4	78.7	79.1	79.4	79.7	80.1	80.4	80.8	81.1	81.4	81.8	82.1	82.5	82.8	83.1	83.5	83.8	84.1	84.4	84.8	85.1	85.4	85.7	86.0
77	79.1	79.4	79.7	80.1	80.4	80.7	81.1	81.4	81.7	82.1	82.4	82.8	83.1	83.4	83.8	84.1	84.4	84.8	85.1	85.4	85.7	86.0	86.3	86.6	86.9
78	80.1	80.4	80.7	81.0	81.4	81.7	82.0	82.4	82.7	83.0	83.4	83.7	84.0	84.4	84.7	85.0	85.3	85.6	86.0	86.3	86.6	86.9	87.2	87.5	87.7
79	81.0	81.4	81.7	82.0	82.3	82.6	83.0	83.3	83.6	84.0	84.3	84.6	84.9	85.3	85.6	85.9	86.2	86.5	86.8	87.1	87.4	87.7	88.0	88.3	88.5
80	82.0	82.3	82.6	83.0	83.3	83.6	83.9	84.2	84.6	84.9	85.2	85.5	85.8	86.2	86.5	86.8	87.1	87.4	87.7	87.9	88.2	88.5	88.8	89.1	89.3
81	83.0	83.3	83.6	83.9	84.2	84.5	84.9	85.2	85.5	85.8	86.1	86.4	86.7	87.0	87.3	87.6	87.9	88.2	88.5	88.8	89.0	89.3	89.6	89.8	90.1
82	83.9	84.2	84.5	84.8	85.1	85.5	85.8	86.1	86.4	86.7	87.0	87.3	87.6	87.9	88.2	88.4	88.7	89.0	89.3	89.5	89.8	90.1	90.3	90.6	90.8
83	84.9	85.2	85.5	85.8	86.1	86.4	86.7	87.0	87.3	87.6	87.9	88.1	88.4	88.7	89.0	89.2	89.5	89.8	90.0	90.3	90.6	90.8	91.1	91.3	91.5
84	85.8	86.1	86.4	86.7	87.0	87.3	87.6	87.9	88.2	88.4	88.7	89.0	89.3	89.5	89.8	90.0	90.3	90.6	90.8	91.1	91.3	91.5	91.8	92.0	92.2
85	86.8	87.0	87.3	87.6	87.9	88.2	88.5	88.7	89.0	89.3	89.6	89.8	90.1	90.3	90.6	90.8	91.1	91.3	91.6	91.8	92.0	92.3	92.5	92.7	92.9
86	87.7	88.0	88.3	88.5	88.8	89.1	89.3	89.6	89.9	90.1	90.4	90.6	90.9	91.1	91.4	91.6	91.8	92.1	92.3	92.5	92.8	93.0	93.2	93.4	93.6
87	88.6	88.9	89.2	89.4	89.7	90.0	90.2	90.5	90.7	91.0	91.2	91.5	91.7	91.9	92.2	92.4	92.6	92.9	93.1	93.3	93.5	93.7	94.0	94.2	94.4
88	89.6	89.8	90.1	90.3	90.6	90.8	91.1	91.3	91.6	91.8	92.1	92.3	92.5	92.7	93.0	93.2	93.4	93.6	93.8	94.1	94.3	94.5	94.7	94.9	95.1
89	90.5	90.8	91.0	91.2	91.5	91.7	92.0	92.2	92.4	92.7	92.9	93.1	93.3	93.6	93.8	94.0	94.2	94.4	94.6	94.8	95.1	95.3	95.5	95.7	95.9
90	91.4	91.7	91.9	92.1	92.4	92.6	92.8	93.1	93.3	93.5	93.7	93.9	94.2	94.4	94.6	94.8	95.0	95.2	95.4	95.6	95.9	96.1	96.3	96.5	96.8
91	92.4	92.6	92.8	93.1	93.3	93.5	93.7	93.9	94.1	94.4	94.6	94.8	95.0	95.2	95.4	95.6	95.9	96.1	96.3	96.5	96.8	97.0	97.2	97.4	97.7
92	93.3	93.5	93.8	94.0	94.2	94.4	94.6	94.8	95.0	95.2	95.5	95.7	95.9	96.1	96.3	96.6	96.8	97.0	97.2	97.5	97.7	98.0	98.2	98.5	98.7
93	94.3	94.5	94.7	94.9	95.1	95.3	95.5	95.8	96.0	96.2	96.4	96.6	96.8	97.1	97.3	97.5	97.8	98.0	98.3	98.6	98.8	99.1	99.4	99.7	100.0
94	95.2	95.4	95.7	95.9	96.1	96.3	96.5	96.7	96.9	97.2	97.4	97.6	97.9	98.1	98.4	98.6	98.9	99.2	99.5	99.8					
95	96.2	96.4	96.7	96.9	97.1	97.3	97.5	97.8	98.0	98.3	98.5	98.8	99.0	99.3	99.6	99.9									
96	97.3	97.5	97.7	97.9	98.2	98.4	98.7	98.9	99.2	99.5	99.7	100.0													
97	98.3	98.6	98.8	99.1	99.4	99.6	99.9																		
98	99.5	99.8																							
99																									
100																									

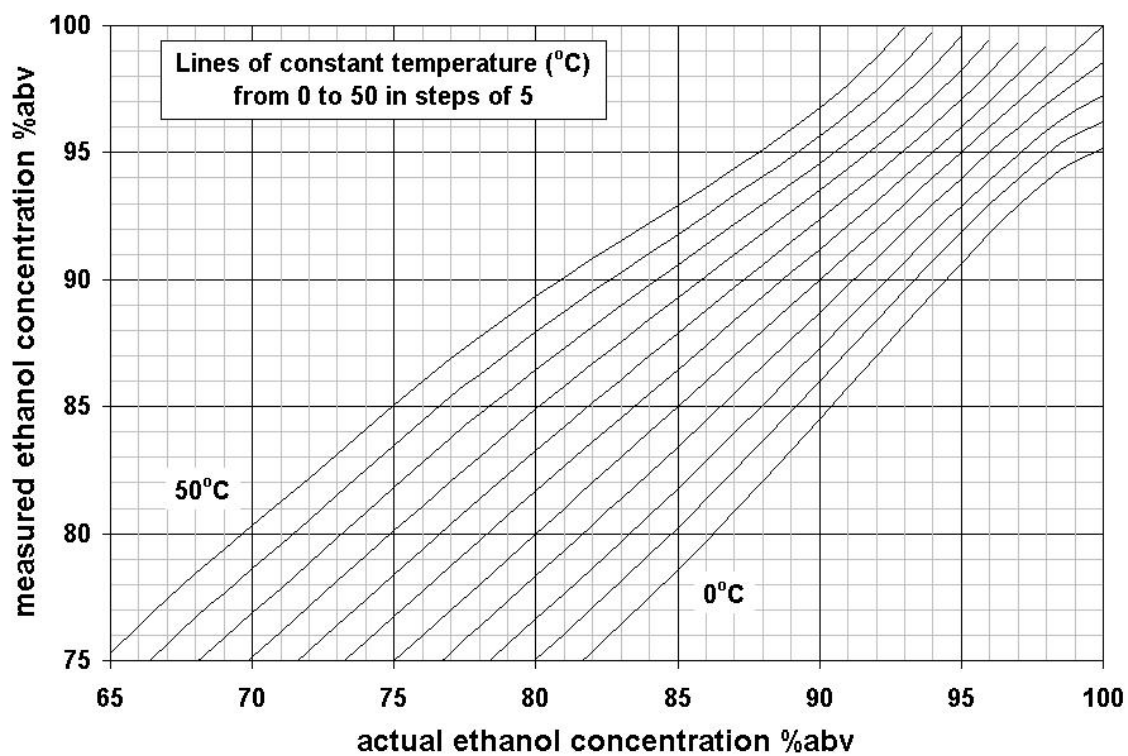
Correction Table for an Alcoholometer Calibrated at 20°C

Graphical Representation of the Correction Table (0 to 100%abv)

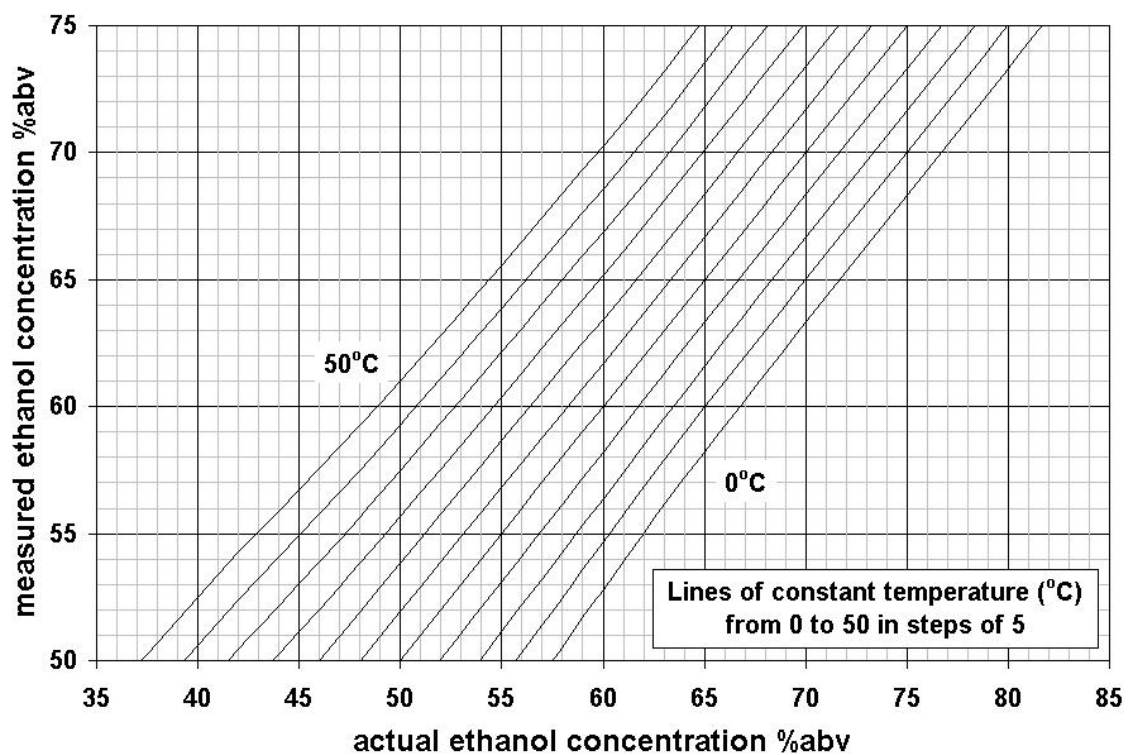


Correction Table for an Alcoholometer Calibrated at 20°C

Graphical Representation of the Correction Table (75 to 100%abv)

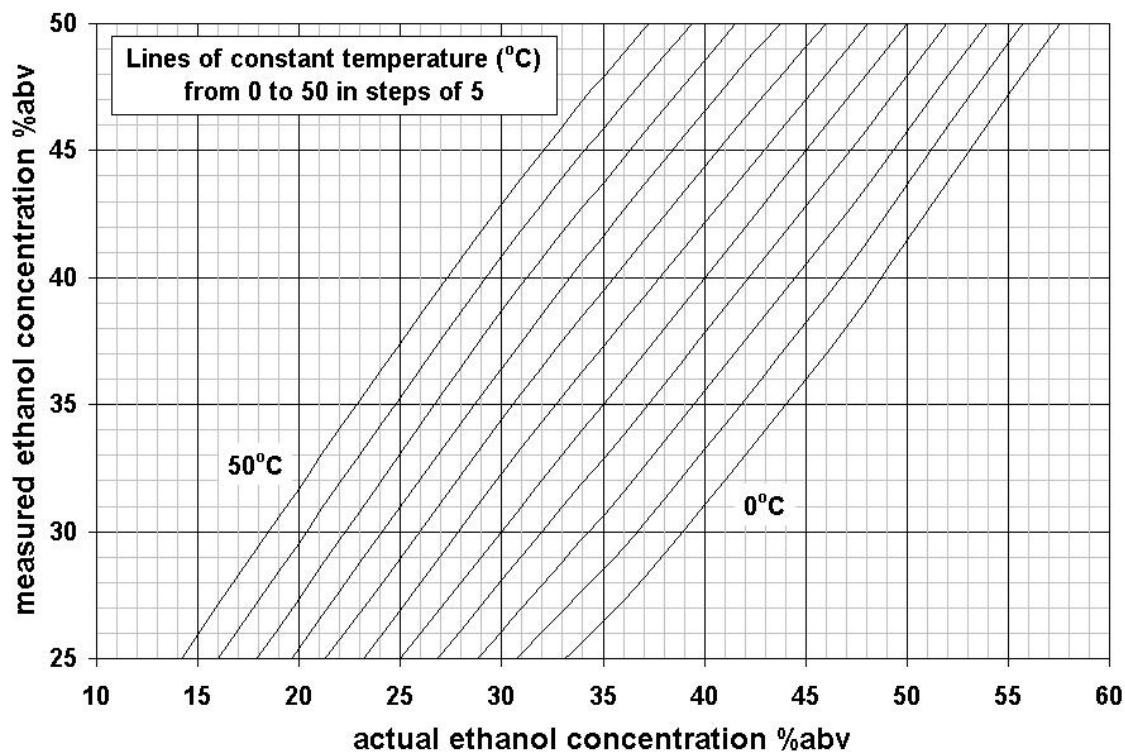


Graphical Representation of the Correction Table (50 to 75%abv)

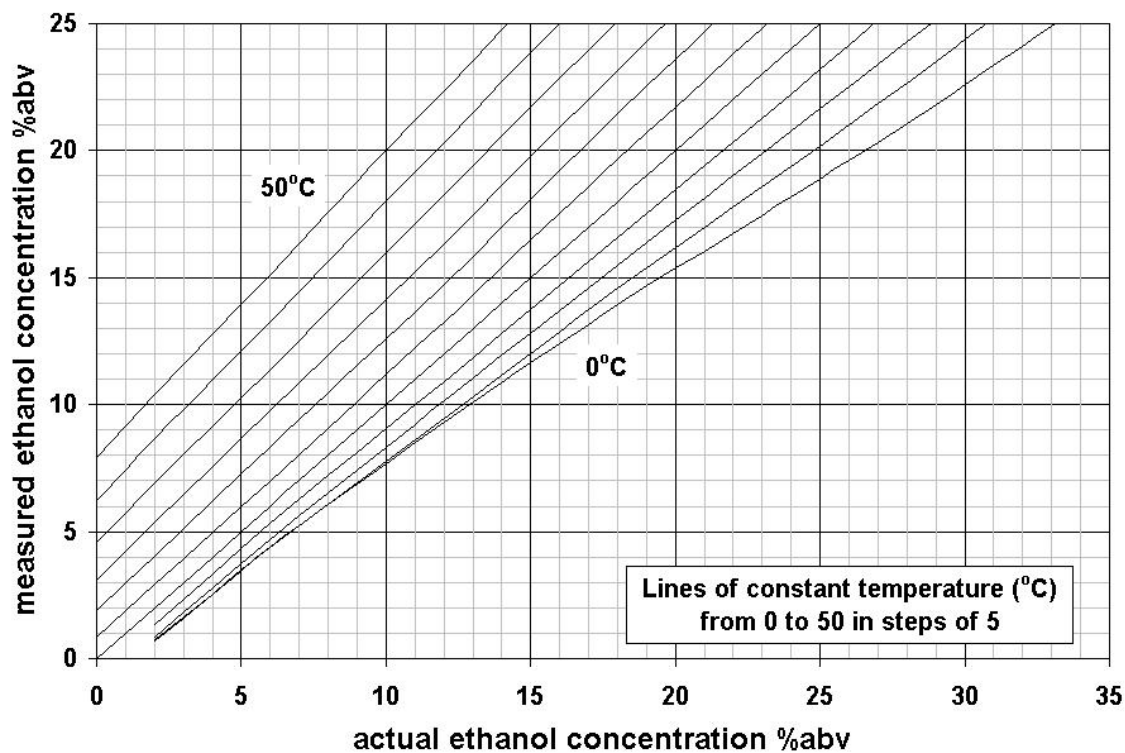


Correction Table for an Alcoholometer Calibrated at 20°C

Graphical Representation of the Correction Table (25 to 50%abv)



Graphical Representation of the Correction Table (0 to 25%abv)



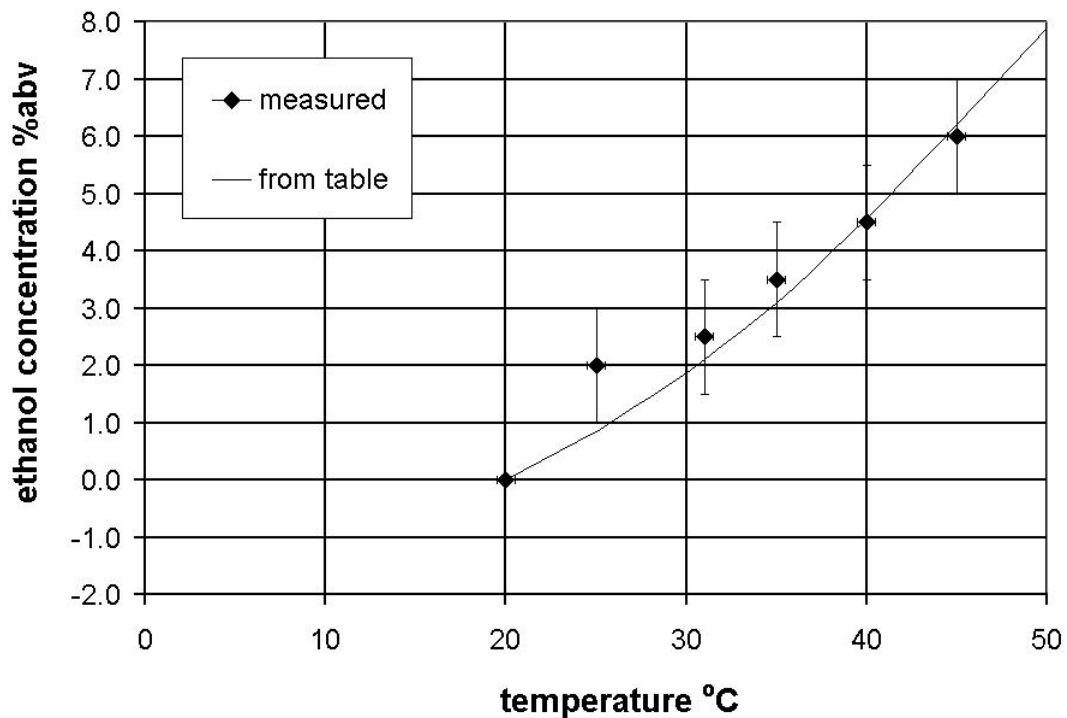
Correction Table for an Alcoholometer Calibrated at 20°C

Comparison of the Correction Table to Experiment

I did a simple experiment with some whisky and boiled water to test the correction table. Using an alcoholometer calibrated at 20°C, I took measurements of the ethanol concentration in boiled water (0%abv), whisky at 27%abv and whisky at 54%abv. The alcoholometer measurements were taken as the temperature of the mixture was varied between 10 to 45°C. I set the test jar in hot and cold water baths to quickly bring the mixture temperature to each extreme. Then as the mixture approached room temperature slowly, the alcoholometer and the corresponding temperature measurements were taken. The alcoholometer and a floating thermometer were left in the mixture throughout each set of measurements.

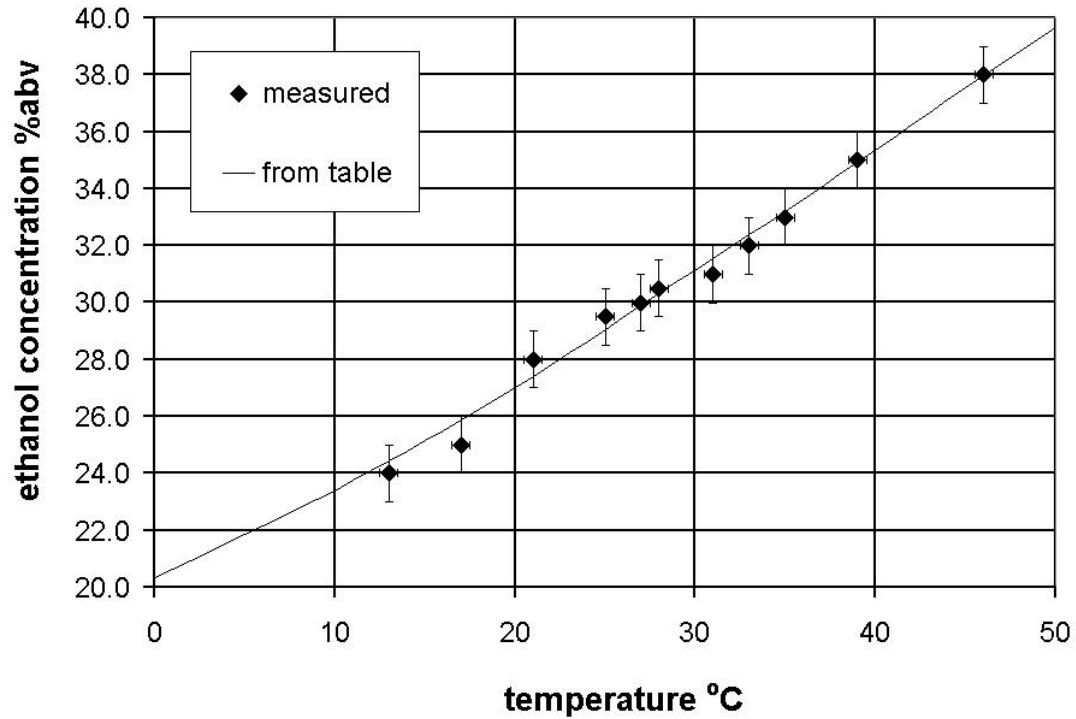
The agreement between the measurements and table are fairly good. However, it must be admitted that measurements for upper range of ethanol concentration are missing. I did not do any experiments with water-ethanol mixtures that have a high concentration of ethanol simply because of a lack of supply.

Boiled tap water (0%abv)



Correction Table for an Alcoholometer Calibrated at 20°C

Whisky (27%abv)



Whisky (54%abv)

