molar mass ethanol: molar mass sugar: 46 g/mol 180 g/mol

density ethanol: density sugar: 0.79 1.55 Alcohol by volume (%) residual sugar (g/L) attenuation (%)

		original gravity																									
	1.020	1.025	1.030	1.035	1.040	1.045	1.050	1.055	1.060	1.065	1.070	1.075	1.080	1.085	1.090	1.095	1.100	1.105	1.110	1.115	1.120		1.130	1.135	1.140	1.145	1.150
0.990			5.3%	5.9%	6.6%	7.2%	7.9%	8.6%	9.2%	9.9%	10.5%	11.2%	11.8%	12.5%	13.2%	13.8%	14.5%	15.1%	15.8%	16.4%	17.1%	17.8%	18.4%	19.1%	19.7%	20.4%	21.1%
			1.2	2.9	4.5	6.1	7.7	9.3	11.0	12.6	14.2	15.8	17.4	19.1	20.7	22.3	23.9	25.5	27.2	28.8	30.4	32.0	33.6	35.3	36.9	38.5	40.1
0.000		4.207	96.5%	93.0%	90.5%	88.5%	86.8%	85.5%	84.4%	83.5%	82.7%	82.0%	81.4%	80.9%	80.4%	80.0%	79.6%	79.3%	78.9%	78.7%	78.4%	78.2%	77.9%	77.7%	77.5%	77.4%	77.2%
0.992	1	4.3%	5.0%	5.7%	6.3%	7.0%	7.6%	8.3%	8.9%	9.6%	10.3%	10.9%	11.6%	12.2%	12.9%	13.6%	14.2%		15.5%	16.2%	16.8%	17.5%	18.2%	18.8%	19.5%	20.1%	20.8%
		1.3 95.5%	2.9 91.7%	4.6 88.9%	6.2 86.8%	7.8 85.2%	9.4 83.9%	11.0 82.9%	12.7 82.0%	14.3 81.3%	15.9 80.6%	17.5 80.1%	<i>19.1</i> 79.6%	20.8 79.2%	22.4 78.8%	24.0 78.5%	25.6 78.2%	27.2 77.9%	28.9 77.6%	<i>30.5</i> 77.4%	32.1 77.2%	<i>33.7</i> 77.0%	<i>35.3</i> 76.8%	<i>37.0</i> 76.7%	<i>38.6</i> 76.5%	40.2 76.4%	41.8 76.2%
0.994	3.4%	4.1%	4.7%	5.4%	6.1%	6.7%	7.4%	8.0%	8.7%	9.3%	10.0%	10.7%	11.3%	12.0%	12.6%	13.3%	13.9%	14.6%	15.3%	15.9%	16.6%	17.2%	17.9%	18.6%	19.2%	19.9%	20.5%
0.55	1.4	3.0	4.6	6.3	7.9	9.5	11.1	12.7	14.4	16.0	17.6	19.2	20.8	22.5	24.1	25.7	27.3	28.9	30.6	32.2	33.8	35.4	37.0	38.7	40.3	41.9	43.5
	94.1%	89.7%	86.8%	84.8%	83.2%	82.0%	81.1%	80.3%	79.6%	79.0%	78.6%	78.2%	77.8%	77.5%	77.2%	76.9%	76.7%	76.5%	76.3%	76.1%	76.0%	75.8%	75.7%	75.6%	75.5%	75.4%	75.3%
0.996		3.8%	4.5%	5.1%	5.8%	6.4%	7.1%	7.8%	8.4%	9.1%	9.7%	10.4%	11.1%	11.7%	12.4%	13.0%	13.7%	14.3%	15.0%	15.7%	16.3%	17.0%	17.6%	18.3%	18.9%	19.6%	20.3%
	3.1	4.7	6.3	7.9	9.6	11.2	12.8	14.4	16.1	17.7	19.3	20.9	22.5	24.2	25.8	27.4	29.0	30.6	32.3	33.9	35.5	37.1	38.7	40.4	42.0	43.6	45.2
	86.8%	83.9%	82.0%	80.6%	79.6%	78.8%	78.2%	77.6%	77.2%	76.8%	76.5%	76.2%	76.0%	75.8%	75.6%	75.4%	75.3%	75.1%	75.0%	74.9%	74.8%	74.7%	74.6%	74.5%	74.4%	74.4%	74.3%
0.998	2.9%	3.6%	4.2%	4.9%	5.5%	6.2%	6.8%	7.5%	8.2%	8.8%	9.5%	10.1%	10.8%	11.4%	12.1%	12.8%	13.4%	14.1%	14.7%	15.4%	16.1%	16.7%	17.4%	18.0%	18.7%	19.3%	20.0%
	4.8	6.4	8.0	9.6	11.3	12.9	14.5	16.1	17.7	19.4	21.0	22.6	24.2	25.9	27.5	29.1	30.7	32.3	34.0	35.6	37.2	38.8	40.4	42.1	43.7	45.3	46.9
	79.6%	78.2%	77.2%	76.5%	76.0%	75.6%	75.3%	75.0%	74.8%	74.6%	74.4%	74.3%	74.2%	74.1%	74.0%	73.9%	73.8%	73.7%	73.7%	73.6%	73.6%	73.5%	73.5%	73.4%	73.4%	73.4%	73.3%
1.000	2.6%	3.3%	3.9%	4.6%	5.3%	5.9%	6.6%	7.2%	7.9%	8.6%	9.2%	9.9%	10.5%	11.2%	11.8%	12.5%	13.2%	13.8%	14.5%	15.1%	15.8%	16.4%	17.1%	17.8%	18.4%	19.1%	19.7%
	6.5	8.1	9.7	11.3	13.0	14.6	16.2	17.8	19.4	21.1	22.7	24.3	25.9	27.6	29.2	30.8	32.4	34.0	35.7	37.3	38.9	40.5	42.1	43.8	45.4	47.0	48.6
4.000	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%	72.4%
1.002		3.0%	3.7%	4.3%	5.0%	5.7%	6.3%	7.0%	7.6%	8.3%	8.9%	9.6%	10.3%	10.9%	11.6%	12.2%	12.9%	13.6%	14.2%	14.9%	15.5%	16.2%	16.8%	17.5%	18.2%	18.8%	19.5%
	8.2 65.1%	9.8	11.4 67.5%	13.0 68.2%	14.7 68.8%	16.3 69.2%	17.9	<i>19.5</i> 69.7%	21.1 70.0%	22.8 70.1%	24.4 70.3%	26.0 70.4%	27.6 70.6%	29.2	30.9 70.8%	32.5 70.8%	34.1 70.9%	35.7 71.0%	<i>37.4</i> 71.1%	<i>39.0</i> 71.1%	40.6 71.2%	<i>42.2</i> 71.2%	43.8 71.3%	45.5 71.3%	<i>47.1</i> 71.3%	48.7 71.4%	50.3 71.4%
1.004		2.8%	3.4%	4.1%	4.7%	5.4%	69.5%	6.7%	7.4%	8.0%	8.7%	9.3%	10.0%	70.7% 10.7%	11.3%	12.0%	12.6%	13.3%	13.9%	14.6%	15.3%	15.9%	16.6%	17.2%	17.9%	18.6%	19.2%
- 1.00-	9.9	11.5	13.1	14.7	16.4	18.0	19.6	21.2	22.8	24.5	26.1	27,7	29.3	30.9	32.6	34.2	35.8	37.4	39.0	40.7	42.3	43.9	45.5	47.2	48.8	50.4	52.0
r a	57.9%	60.8%	62.7%	64.1%	65.1%	65.9%	66.6%	67.1%	67.5%	67.9%	68.2%	68.5%	68.8%	69.0%	69.2%	69.3%	69.5%	69.6%	69.7%	69.9%	70.0%	70.1%	70.1%	70.2%	70.3%	70.4%	70.4%
1.000	1.8%	2.5%	3.2%	3.8%	4.5%	5.1%	5.8%	6.4%	7.1%	7.8%	8.4%	9.1%	9.7%	10.4%	11.1%	11.7%	12.4%		13.7%	14.3%	15.0%	15.7%	16.3%	17.0%	17.6%	18.3%	18.9%
1 2 1	11.6	13.2	14.8	16.4	18.1	19.7	21.3	22.9	24.5	26.2	27.8	29.4	31.0	32.6	34.3	35.9	37.5	39.1	40.7	42.4	44.0	45.6	47.2	48.9	50.5	52.1	53.7
1 1	50.7%	55.0%	57.9%	60.0%	61.5%	62.7%	63.7%	64.5%	65.1%	65.7%	66.2%	66.6%	66.9%	67.3%	67.5%	67.8%	68.0%	68.2%	68.4%	68.6%	68.8%	68.9%	69.0%	69.2%	69.3%	69.4%	69.5%
1.008	1.6%	2.2%	2.9%	3.6%	4.2%	4.9%	5.5%	6.2%	6.8%	7.5%	8.2%	8.8%	9.5%	10.1%	10.8%	11.4%	12.1%	12.8%	13.4%	14.1%	14.7%	15.4%	16.1%	16.7%	17.4%	18.0%	18.7%
	13.3	14.9	16.5	18.1	19.8	21.4	23.0	24.6	26.2	27.9	29.5	31.1	32.7	34.3	36.0	37.6	39.2	40.8	42.4	44.1	45.7	47.3	48.9	50.5	52.2	53.8	55.4
	43.4%	49.2%	53.1%	55.8%	57.9%	59.5%	60.8%	61.8%	62.7%	63.5%	64.1%	64.6%	65.1%	65.6%	65.9%	66.3%	66.6%	66.9%	67.1%	67.3%	67.5%	67.7%	67.9%	68.1%	68.2%	68.4%	68.5%
1.010		2.0%	2.6%	3.3%	3.9%	4.6%	5.3%	5.9%	6.6%	7.2%	7.9%	8.6%	9.2%	9.9%	10.5%	11.2%	11.8%	12.5%	13.2%	13.8%	14.5%	15.1%	15.8%	16.4%	17.1%	17.8%	18.4%
	15.0	16.6	18.2	19.8	21.5	23.1	24.7	26.3	27.9	29.6	31.2	32.8	34.4	36.0	37.7	39.3	40.9	42.5	44.1	45.8	47.4	49.0	50.6	52.2	53.9	55.5	57.1
1.012	36.2%	43.4%	48.2%	51.7%	54.3% 3.7%	56.3%	57.9%	59.2% 5.7%	60.3%	61.2%	62.0%	62.7%	63.3%	63.9%	64.3%	64.8%	65.1%	65.5% 12.2%	65.8%	66.1%	66.3% 14.2%	66.6%	66.8% 1 E E0/	67.0%	67.2%	67.4%	67.5% 18.2%
1.012	1.1% 16.7	1.7% 18.3	2.4% 19.9	3.0% 21.5	23.2	4.3% 24.8	5.0% 26.4	28.0	6.3% 29.6	7.0% <i>31.3</i>	7.6% <i>32.9</i>	8.3% <i>34.5</i>	8.9% <i>36.1</i>	9.6% <i>37.7</i>	10.3% <i>39.4</i>	10.9% <i>41.0</i>	11.6% <i>42.6</i>	44.2	45.8	13.6% <i>47.5</i>	49.1	14.9% <i>50.7</i>	15.5% <i>52.3</i>	16.2% 53.9	16.8% 55.6	17.5% <i>57.2</i>	58.8
	28.9%	37.6%	43.4%	47.6%	50.7%	53.1%	55.0%	56.6%	57.9%	59.0%	60.0%	60.8%	61.5%	62.2%	62.7%	63.2%	63.7%	64.1%	64.5%	64.8%	65.1%	65.4%	65.7%	65.9%	66.2%	66.4%	66.6%
1.014	+	1.4%	2.1%	2.8%	3.4%	4.1%	4.7%	5.4%	6.1%	6.7%	7.4%	8.0%	8.7%	9.3%	10.0%	10.7%	11.3%	12.0%	12.6%	13.3%	13.9%	14.6%	15.3%	15.9%	16.6%	17.2%	17.9%
	18.4	20.0	21.6	23.2	24.8	26.5	28.1	29.7	31.3	33.0	34.6	36.2	37.8	39.4	41.1	42.7	44.3	45.9	47.5	49.2	50.8	52.4	54.0	55.6	57.3	58.9	60.5
	21.7%	31.8%	38.6%	43.4%	47.0%	49.9%	52.1%	53.9%	55.5%	56.8%	57.9%	58.9%	59.7%	60.4%	61.1%	61.7%	62.2%	62.7%	63.2%	63.6%	63.9%	64.3%	64.6%	64.9%	65.1%	65.4%	65.6%
1.016	0.5%	1.2%	1.8%	2.5%	3.2%	3.8%	4.5%	5.1%	5.8%	6.4%	7.1%	7.8%	8.4%	9.1%	9.7%	10.4%	11.1%	11.7%	12.4%	13.0%	13.7%	14.3%	15.0%	15.7%	16.3%	17.0%	17.6%
	20.1	21.7	23.3	24.9	26.5	28.2	29.8	31.4	33.0	34.7	36.3	37.9	39.5	41.1	42.8	44.4	46.0	47.6	49.2	50.9	52.5	54.1	55.7	57.3	59.0	60.6	62.2
	14.5%	26.1%	33.8%		43.4%	46.6%	49.2%	51.3%		54.6%	55.8%	56.9%	57.9%	58.7%	59.5%	60.2%	60.8%	61.3%	61.8%	62.3%	62.7%	63.1%	63.5%	63.8%	64.1%	64.4%	64.6%
1.018	0.3%	0.9%	1.6%	2.2%	2.9%	3.6%	4.2%	4.9%	5.5%	6.2%	6.8%	7.5%		8.8%	9.5%	10.1%		11.4%	12.1%	12.8%						16.7%	17.4%
	21.8	23.4		26.6	28.2	29.9	31.5	33.1	34.7	36.3	38.0	39.6	41.2	42.8	44.5	46.1	47.7		50.9	52.6	54.2	55.8	57.4	59.0	60.7	62.3	63.9
4.05	7.2%	20.3%	28.9%	35.2%	39.8%	43.4%	46.3%	48.7%	50.7%	52.3%	53.8%	55.0%		57.0%	57.9%	58.7%	59.3%		60.5%	61.0%	61.5%	61.9%	62.3%	62.7%	63.1%	63.4%	63.7%
1.020		0.7%	1.3%	2.0%	2.6%	3.3%	3.9%	4.6%	5.3%	5.9%	6.6%	7.2%	7.9%	8.6%	9.2%	9.9%	10.5%		11.8%	12.5%	13.2%	13.8%	14.5%	15.1%	15.8%	16.4%	17.1%
	23.5	25.1	26.7	28.3	29.9	31.6	33.2	34.8	36.4	38.0	<i>39.7</i>	41.3	42.9	44.5	46.1	47.8	49.4	51.0	52.6	<i>54.3</i>	55.9	57.5	59.1	60.7	62.4	64.0	65.6
	0.0%	14.5%	24.1%	31.0%	36.2%	40.2%	43.4%	46.1%	48.2%	50.1%	51.7%	53.1%	54.3%	55.3%	56.3%	57.1%	57.9%	58.6%	59.2%	59.8%	60.3%	60.8%	61.2%	61.6%	62.0%	62.4%	62.7%