Forms and tables for a detailed home brewing log book

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This log book has been designed for the avid home brewer who wants to keep very detailed notes of the recipe, brewing process and taste progression of the beer. It provides a number of fields, many of which may not be needed for a particular brew, but it allows for consistent record keeping and quick comparison between batches.

Here are a few notes regarding the use of these sheets:

Recipe

Batch number/ batch name: note the number and name of the batch on the top of every page.

Water treatment: this has been primarily designed for brewers who build their own water, but can also be used when a mineral analysis of the brewing water is available. There are fields for 2 water sources to cover blending of waters. Add the amount of strike and sparge water to be used and the amount of salts that will be added. Use only one line if strike and sparge water will be treated the same or you don't have to split them for water treatment (e.g. large enough vessel). A computer program should be used to calculate the resulting mineral levels which are then noted on the right hand side. A nomograph is available to determine the residual alkalinity of the brewing water. The german hardness scale is given since the residual alkalinity is easily expressed in this scale. Check Palmer on how to use the nomograph (http://www.howtobrew.com/section3/chapter15-3.html)

Grist: List the amount, grist percentage, type and maltster of the grains used. If malt extract or sugars are used they could also be listed here or in the hops/spices section. The rightmost column can be used to record the gap width that the mill was set to. This has an effect on the efficiency and lauter speed and might be of interest later.

Hops/spices: list items added during the boil here and check the IBU formula that was used.

Miscellaneous: room for other recipe related notes

Yeast: list strain of yeast, propagation and pitch amount here

Brew day

mash: Note the planned mash schedule here, especially the strike water temp and desired rest temperature. The right hand side provides fields to fill in the actual measured rest temperatures and pH (in case pH was measured).

Mash diagram: use this diagram to plot the mash schedule if desired

Lauter: This has been designed for batch sparging and lets you record the lauter wort clarity and pH levels of the run-offs

Boil: Record boil parameters here. Important are pre-boil and post-boil volume. When calculating boil-off, note that there is a volume difference of about 4% between boiling hot and room temperature wort. If the final gravity is corrected with water additions, it can be noted as well.

Time-comment: Use this section to record the brew day progression , especially mash and lauter. Start the time with dough-in and record steps like infusions, decoctions, rest temperature reached, acid or salt additions, lauter start/end, length of oxygenation, …..

Fermentation

Use this diagram to record the fermentation progression. Pitch temperature should be noted as well as the temperature progression of the beer. If the gravity is measured you can add this as well. The record of fermentation temperature will be helpful in finding the source of fermentation off-flavors and the gravity readings are good for judging the yeast performance.

The left hand space provides room for short notes (racked to keg, started tasting good, added kraeusen ….)

If a fast ferment test is performed and the limit of attenuation is known, it can be recorded in the upper left corner.

Notes

Use this page to record more detailed notes about the beer progression as well as tasting notes and suggestions for future improvements.

Tables

Keep these tables in the back of the note book as they provide a quick way of determining attenuation and alcohol content.

batch number	batch name		brew date

water treatment / result

water treatment								result		

water source 1		%	water source 2			%	Ca^{2+} mg/l	Mg^{2+} mg/l	HCO_3^- (rest) mg/l

strike water	l	$CaSO_4\,2H_2O$ g	NaCl g	$MgSO_4\,7H_2O$ g	$CaCl_2\,2H_2O$ g	$NaHCO_3$ g	$CaCO_3$ g	g	Na^+ mg/l	SO_4^{2-} mg/l	RA dH

sparge water	l	$CaSO_4\,2H_2O$ g	NaCl g	$MgSO_4\,7H_2O$ g	$CaCl_2\,2H_2O$ g	$NaHCO_3$ g	$CaCO_3$ g	g	Cl^- mg/l	HCO_3^- mg/l	

mg/l residual Alkalinity HCO_3^-

Restalkalitaet dH (RA)

- 100   - 50   0   50   100   150   200   250   300

- 5   0   5   10

mg/l HCO_3^-
dH (KH)

0   50   100   150   200   250   300   350   400

0   10

mg/l Mg
dH (Mg)

0   50

0   10

5   10

mg/l Ca
dH (Ca)

0   50   100   150   200   0

0   10   20   30
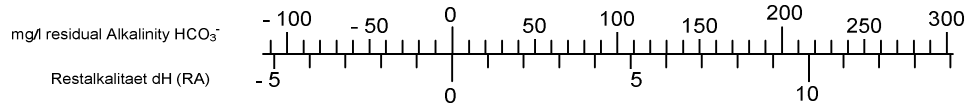
$$RA = KH - \frac{CH + 0.5MH}{3.5}$$
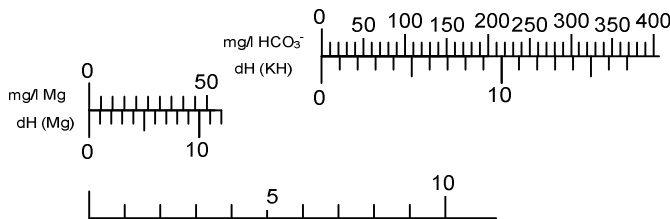
1 dH (KH) = 21,7 mg/l HCO_3^-

1 dH (MH) = 4.33 mg/l Mg

1 dH (CH) = 7.14 mg/l Ca

grist / miscellaneous

grist					miscellaneous

amount kg	%	type	maltster	mill gap mm	
amount kg	%	type	maltster	mill gap mm	
amount kg	%	type	maltster	mill gap mm	
amount kg	%	type	maltster	mill gap mm	
amount kg	%	type	maltster	mill gap mm	
amount kg	%	type	maltster	mill gap mm	
total kg					

hops/spices

amount g	a.-acid	IBU	boil time	type
amount g	a.-acid	IBU	boil time	type
amount g	a.-acid	IBU	boil time	type
amount g	a.-acid	IBU	boil time	type
amount g	a.-acid	IBU	boil time	type
amount g	a.-acid	IBU	boil time	type
	total IBU	IBU formula: ☐ Tinseth ☐ Rager ☐ Garetz ☐ Other_____		

yeast

type	propagation	pitch amount

batch number	batch name	

mash

	targeted								actual	

rest name	amount		☐ infusion ☐ decoction ☐ direct heat	temperature °C	rise time min	rest temp °C	rest time min	water/grist l/kg	rest temp °C	pH
rest name	amount l	☐ infusion ☐ decoction ☐ direct heat	temperature °C	rise time min	rest temp °C	rest time min	water/grist l/kg	rest temp °C	pH
rest name	amount l	☐ infusion ☐ decoction ☐ direct heat	temperature °C	rise time min	rest temp °C	rest time min	water/grist l/kg	rest temp °C	pH
rest name	amount l	☐ infusion ☐ decoction ☐ direct heat	temperature °C	rise time min	rest temp °C	rest time min	water/grist l/kg	rest temp °C	pH
rest name	amount l	☐ infusion ☐ decoction ☐ direct heat	temperature °C	rise time min	rest temp °C	rest time min	water/grist l/kg	rest temp °C	pH

0 hr 10 20 30 40 50 1 hr 00 10 20 30 40 50 2 hr 00 10 20 30 40 50 3 hr 00 10 20 30 40 50 00

°F/°C
212 100
194/90
176/80
158/70
140/60
122/50
104/40
86/30
68/20
50/10

10 20 30 40 50 00 10 20 30 40 50 00 10 20 30 40 50 00 10 20 30 40 50 00
0 hr 1 hr 2 hr 3 hr

lauter	boil			
lauter wort clarity cloudy ☐ clear ☐ brilliant ☐	pre boil volume (hot) l	pre boil extract °P	boil time min	pre boil pH
run-off pH (1. sparge) run-off pH (2. sparge)	cast-out volume hot ☐ cold ☐ l	water added l	evaporation l	evaporation rate %/h	cast-out pH

time	comment	time	comment

brew house result	cast-out volume l	startinmg extract °P	brew house efficiency %

batch number			batch name
pitch temperature		pitch pH	
°C			
fast ferment test AE		limit of attenuation	
°P		%	

● beer temperature   ✳ ambient temperature   △ AE   □ pH

F   C

70 — 20

60 — 15

50 — 10

40 — 5

30 — 0

20 — 20 — 20 — 20 — 20

15 — 15 — 15 — 15 — 15

10 — 10 — 10 — 10 — 10

5 — 5 — 5 — 5 — 5

0 — 0 — 0 — 0 — 0

S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F S S M T W T F 2 3 0 1 2 3 0 1 2 3 0 1 2 3

0 week   1 week   2 week   3 week   4 week   5 week   2 month   3 month   4 month

1 month

batch number	batch name

date	comment
age	

date	comment
age	

date	comment
age	

date	comment
age	

date	comment
age	

date	comment
age	

date	comment
age	

date	comment
age	

date	aroma	appearance	taste
age			

aroma

hops none |__|__|__|__|__| strong
malt none |__|__|__|__|__| strong
other none |__|__|__|__|__| strong

aroma ___/12

appearance

carity none |__|__|__|__|__| strong
head   none |__|__|__|__|__| strong

appearance ___/3

taste

bitter   none |__|__|__|__|__| strong
sweet   none |__|__|__|__|__| strong
mouthfeel   none |__|__|__|__|__| strong
carbonation none |__|__|__|__|__| strong

flavor ___/20 mouthfeel ___/5
overall ___/10   total ___/50

suggested improvements

Apparent attenuation

	original extract (%)																					
	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	
1.00	90.0	90.5	90.9	91.3	91.7	92.0	92.3	92.6	92.9	93.1	93.3	93.5	93.8	93.9	94.1	94.3	94.4	94.6	94.7	94.9	95.0	1.00
1.10	89.0	89.5	90.0	90.4	90.8	91.2	91.5	91.9	92.1	92.4	92.7	92.9	93.1	93.3	93.5	93.7	93.9	94.1	94.2	94.4	94.5	1.10
1.20	88.0	88.6	89.1	89.6	90.0	90.4	90.8	91.1	91.4	91.7	92.0	92.3	92.5	92.7	92.9	93.1	93.3	93.5	93.7	93.8	94.0	1.20
1.30	87.0	87.6	88.2	88.7	89.2	89.6	90.0	90.4	90.7	91.0	91.3	91.6	91.9	92.1	92.4	92.6	92.8	93.0	93.2	93.3	93.5	1.30
1.40	86.0	86.7	87.3	87.8	88.3	88.8	89.2	89.6	90.0	90.3	90.7	91.0	91.3	91.5	91.8	92.0	92.2	92.4	92.6	92.8	93.0	1.40
1.50	85.0	85.7	86.4	87.0	87.5	88.0	88.5	88.9	89.3	89.7	90.0	90.3	90.6	90.9	91.2	91.4	91.7	91.9	92.1	92.3	92.5	1.50
1.60	84.0	84.8	85.5	86.1	86.7	87.2	87.7	88.1	88.6	89.0	89.3	89.7	90.0	90.3	90.6	90.9	91.1	91.4	91.6	91.8	92.0	1.60
1.70	83.0	83.8	84.5	85.2	85.8	86.4	86.9	87.4	87.9	88.3	88.7	89.0	89.4	89.7	90.0	90.3	90.6	90.8	91.1	91.3	91.5	1.70
1.80	82.0	82.9	83.6	84.3	85.0	85.6	86.2	86.7	87.1	87.6	88.0	88.4	88.8	89.1	89.4	89.7	90.0	90.3	90.5	90.8	91.0	1.80
1.90	81.0	81.9	82.7	83.5	84.2	84.8	85.4	85.9	86.4	86.9	87.3	87.7	88.1	88.5	88.8	89.1	89.4	89.7	90.0	90.3	90.5	1.90
2.00	80.0	81.0	81.8	82.6	83.3	84.0	84.6	85.2	85.7	86.2	86.7	87.1	87.5	87.9	88.2	88.6	88.9	89.2	89.5	89.7	90.0	2.00
2.10	79.0	80.0	80.9	81.7	82.5	83.2	83.8	84.4	85.0	85.5	86.0	86.5	86.9	87.3	87.6	88.0	88.3	88.6	88.9	89.2	89.5	2.10
2.20	78.0	79.0	80.0	80.9	81.7	82.4	83.1	83.7	84.3	84.8	85.3	85.8	86.3	86.7	87.1	87.4	87.8	88.1	88.4	88.7	89.0	2.20
2.30	77.0	78.1	79.1	80.0	80.8	81.6	82.3	83.0	83.6	84.1	84.7	85.2	85.6	86.1	86.5	86.9	87.2	87.6	87.9	88.2	88.5	2.30
2.40	76.0	77.1	78.2	79.1	80.0	80.8	81.5	82.2	82.9	83.4	84.0	84.5	85.0	85.5	85.9	86.3	86.7	87.0	87.4	87.7	88.0	2.40
2.50	75.0	76.2	77.3	78.3	79.2	80.0	80.8	81.5	82.1	82.8	83.3	83.9	84.4	84.8	85.3	85.7	86.1	86.5	86.8	87.2	87.5	2.50
2.60	74.0	75.2	76.4	77.4	78.3	79.2	80.0	80.7	81.4	82.1	82.7	83.2	83.8	84.2	84.7	85.1	85.6	85.9	86.3	86.7	87.0	2.60
2.70	73.0	74.3	75.5	76.5	77.5	78.4	79.2	80.0	80.7	81.4	82.0	82.6	83.1	83.6	84.1	84.6	85.0	85.4	85.8	86.2	86.5	2.70
2.80	72.0	73.3	74.5	75.7	76.7	77.6	78.5	79.3	80.0	80.7	81.3	81.9	82.5	83.0	83.5	84.0	84.4	84.9	85.3	85.6	86.0	2.80
2.90	71.0	72.4	73.6	74.8	75.8	76.8	77.7	78.5	79.3	80.0	80.7	81.3	81.9	82.4	82.9	83.4	83.9	84.3	84.7	85.1	85.5	2.90
3.00	70.0	71.4	72.7	73.9	75.0	76.0	76.9	77.8	78.6	79.3	80.0	80.6	81.3	81.8	82.4	82.9	83.3	83.8	84.2	84.6	85.0	3.00
3.10	69.0	70.5	71.8	73.0	74.2	75.2	76.2	77.0	77.9	78.6	79.3	80.0	80.6	81.2	81.8	82.3	82.8	83.2	83.7	84.1	84.5	3.10
3.20	68.0	69.5	70.9	72.2	73.3	74.4	75.4	76.3	77.1	77.9	78.7	79.4	80.0	80.6	81.2	81.7	82.2	82.7	83.2	83.6	84.0	3.20
3.30	67.0	68.6	70.0	71.3	72.5	73.6	74.6	75.6	76.4	77.2	78.0	78.7	79.4	80.0	80.6	81.1	81.7	82.2	82.6	83.1	83.5	3.30
3.40	66.0	67.6	69.1	70.4	71.7	72.8	73.8	74.8	75.7	76.6	77.3	78.1	78.8	79.4	80.0	80.6	81.1	81.6	82.1	82.6	83.0	3.40
3.50	65.0	66.7	68.2	69.6	70.8	72.0	73.1	74.1	75.0	75.9	76.7	77.4	78.1	78.8	79.4	80.0	80.6	81.1	81.6	82.1	82.5	3.50
3.60	64.0	65.7	67.3	68.7	70.0	71.2	72.3	73.3	74.3	75.2	76.0	76.8	77.5	78.2	78.8	79.4	80.0	80.5	81.1	81.5	82.0	3.60
3.70	63.0	64.8	66.4	67.8	69.2	70.4	71.5	72.6	73.6	74.5	75.3	76.1	76.9	77.6	78.2	78.9	79.4	80.0	80.5	81.0	81.5	3.70
3.80	62.0	63.8	65.5	67.0	68.3	69.6	70.8	71.9	72.9	73.8	74.7	75.5	76.3	77.0	77.6	78.3	78.9	79.5	80.0	80.5	81.0	3.80
3.90	61.0	62.9	64.5	66.1	67.5	68.8	70.0	71.1	72.1	73.1	74.0	74.8	75.6	76.4	77.1	77.7	78.3	78.9	79.5	80.0	80.5	3.90
4.00	60.0	61.9	63.6	65.2	66.7	68.0	69.2	70.4	71.4	72.4	73.3	74.2	75.0	75.8	76.5	77.1	77.8	78.4	78.9	79.5	80.0	4.00
4.25	57.5	59.5	61.4	63.0	64.6	66.0	67.3	68.5	69.6	70.7	71.7	72.6	73.4	74.2	75.0	75.7	76.4	77.0	77.6	78.2	78.8	4.25
4.50	55.0	57.1	59.1	60.9	62.5	64.0	65.4	66.7	67.9	69.0	70.0	71.0	71.9	72.7	73.5	74.3	75.0	75.7	76.3	76.9	77.5	4.50
4.75	52.5	54.8	56.8	58.7	60.4	62.0	63.5	64.8	66.1	67.2	68.3	69.4	70.3	71.2	72.1	72.9	73.6	74.3	75.0	75.6	76.3	4.75
5.00	50.0	52.4	54.5	56.5	58.3	60.0	61.5	63.0	64.3	65.5	66.7	67.7	68.8	69.7	70.6	71.4	72.2	73.0	73.7	74.4	75.0	5.00
5.25	47.5	50.0	52.3	54.3	56.3	58.0	59.6	61.1	62.5	63.8	65.0	66.1	67.2	68.2	69.1	70.0	70.8	71.6	72.4	73.1	73.8	5.25
5.50	45.0	47.6	50.0	52.2	54.2	56.0	57.7	59.3	60.7	62.1	63.3	64.5	65.6	66.7	67.6	68.6	69.4	70.3	71.1	71.8	72.5	5.50
5.75	42.5	45.2	47.7	50.0	52.1	54.0	55.8	57.4	58.9	60.3	61.7	62.9	64.1	65.2	66.2	67.1	68.1	68.9	69.7	70.5	71.3	5.75
6.00	40.0	42.9	45.5	47.8	50.0	52.0	53.8	55.6	57.1	58.6	60.0	61.3	62.5	63.6	64.7	65.7	66.7	67.6	68.4	69.2	70.0	6.00
6.25	37.5	40.5	43.2	45.7	47.9	50.0	51.9	53.7	55.4	56.9	58.3	59.7	60.9	62.1	63.2	64.3	65.3	66.2	67.1	67.9	68.8	6.25
6.50	35.0	38.1	40.9	43.5	45.8	48.0	50.0	51.9	53.6	55.2	56.7	58.1	59.4	60.6	61.8	62.9	63.9	64.9	65.8	66.7	67.5	6.50
6.75	32.5	35.7	38.6	41.3	43.8	46.0	48.1	50.0	51.8	53.4	55.0	56.5	57.8	59.1	60.3	61.4	62.5	63.5	64.5	65.4	66.3	6.75
7.00	30.0	33.3	36.4	39.1	41.7	44.0	46.2	48.1	50.0	51.7	53.3	54.8	56.3	57.6	58.8	60.0	61.1	62.2	63.2	64.1	65.0	7.00
7.25	27.5	31.0	34.1	37.0	39.6	42.0	44.2	46.3	48.2	50.0	51.7	53.2	54.7	56.1	57.4	58.6	59.7	60.8	61.8	62.8	63.8	7.25
7.50	25.0	28.6	31.8	34.8	37.5	40.0	42.3	44.4	46.4	48.3	50.0	51.6	53.1	54.5	55.9	57.1	58.3	59.5	60.5	61.5	62.5	7.50
7.75	22.5	26.2	29.5	32.6	35.4	38.0	40.4	42.6	44.6	46.6	48.3	50.0	51.6	53.0	54.4	55.7	56.9	58.1	59.2	60.3	61.3	7.75
8.00	20.0	23.8	27.3	30.4	33.3	36.0	38.5	40.7	42.9	44.8	46.7	48.4	50.0	51.5	52.9	54.3	55.6	56.8	57.9	59.0	60.0	8.00
8.50	15.0	19.0	22.7	26.1	29.2	32.0	34.6	37.0	39.3	41.4	43.3	45.2	46.9	48.5	50.0	51.4	52.8	54.1	55.3	56.4	57.5	8.50
9.00	10.0	14.3	18.2	21.7	25.0	28.0	30.8	33.3	35.7	37.9	40.0	41.9	43.8	45.5	47.1	48.6	50.0	51.4	52.6	53.8	55.0	9.00
9.50	5.0	9.5	13.6	17.4	20.8	24.0	26.9	29.6	32.1	34.5	36.7	38.7	40.6	42.4	44.1	45.7	47.2	48.6	50.0	51.3	52.5	9.50
10.00	0.0	4.8	9.1	13.0	16.7	20.0	23.1	25.9	28.6	31.0	33.3	35.5	37.5	39.4	41.2	42.9	44.4	45.9	47.4	48.7	50.0	10.00
10.50	-	0.0	4.5	8.7	12.5	16.0	19.2	22.2	25.0	27.6	30.0	32.3	34.4	36.4	38.2	40.0	41.7	43.2	44.7	46.2	47.5	10.50
11.00	-	-	0.0	4.3	8.3	12.0	15.4	18.5	21.4	24.1	26.7	29.0	31.3	33.3	35.3	37.1	38.9	40.5	42.1	43.6	45.0	11.00
11.50	-	-	-	0.0	4.2	8.0	11.5	14.8	17.9	20.7	23.3	25.8	28.1	30.3	32.4	34.3	36.1	37.8	39.5	41.0	42.5	11.50
12.00	-	-	-	-	0.0	4.0	7.7	11.1	14.3	17.2	20.0	22.6	25.0	27.3	29.4	31.4	33.3	35.1	36.8	38.5	40.0	12.00
12.50	-	-	-	-	-	0.0	3.8	7.4	10.7	13.8	16.7	19.4	21.9	24.2	26.5	28.6	30.6	32.4	34.2	35.9	37.5	12.50
13.00	-	-	-	-	-	-	0.0	3.7	7.1	10.3	13.3	16.1	18.8	21.2	23.5	25.7	27.8	29.7	31.6	33.3	35.0	13.00
13.50	-	-	-	-	-	-	-	0.0	3.6	6.9	10.0	12.9	15.6	18.2	20.6	22.9	25.0	27.0	28.9	30.8	32.5	13.50
14.00	-	-	-	-	-	-	-	-	0.0	3.4	6.7	9.7	12.5	15.2	17.6	20.0	22.2	24.3	26.3	28.2	30.0	14.00
14.50	-	-	-	-	-	-	-	-	-	0.0	3.3	6.5	9.4	12.1	14.7	17.1	19.4	21.6	23.7	25.6	27.5	14.50
15.00	-	-	-	-	-	-	-	-	-	-	0.0	3.2	6.3	9.1	11.8	14.3	16.7	18.9	21.1	23.1	25.0	15.00
15.50	-	-	-	-	-	-	-	-	-	-	-	0.0	3.1	6.1	8.8	11.4	13.9	16.2	18.4	20.5	22.5	15.50
16.00	-	-	-	-	-	-	-	-	-	-	-	-	0.0	3.0	5.9	8.6	11.1	13.5	15.8	17.9	20.0	16.00
16.50	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.9	5.7	8.3	10.8	13.2	15.4	17.5	16.50
17.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.9	5.6	8.1	10.5	12.8	15.0	17.00
17.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.8	5.4	7.9	10.3	12.5	17.50
18.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.7	5.3	7.7	10.0	18.00
18.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.6	5.1	7.5	18.50
19.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.6	5.0	19.00
19.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.5	19.50
20.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	20.00
	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	
	original extract (%)																					

Left and right axis label: apparent extract (%)

Real Attenuation

apparent extract (%)	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	apparent extract (%)
1.00	73.7	74.1	74.5	74.8	75.1	75.4	75.6	75.9	76.1	76.3	76.5	76.6	76.8	77.0	77.1	77.2	77.4	77.5	77.6	77.7	77.8	1.00
1.10	72.9	73.3	73.7	74.1	74.4	74.7	75.0	75.2	75.5	75.7	75.9	76.1	76.3	76.5	76.6	76.8	76.9	77.0	77.2	77.3	77.4	1.10
1.20	72.1	72.6	73.0	73.4	73.7	74.1	74.4	74.6	74.9	75.1	75.4	75.6	75.8	76.0	76.1	76.3	76.5	76.6	76.7	76.9	77.0	1.20
1.30	71.3	71.8	72.2	72.7	73.0	73.4	73.7	74.0	74.3	74.6	74.8	75.0	75.3	75.5	75.7	75.8	76.0	76.2	76.3	76.5	76.6	1.30
1.40	70.5	71.0	71.5	71.9	72.4	72.7	73.1	73.4	73.7	74.0	74.3	74.5	74.8	75.0	75.2	75.4	75.5	75.7	75.9	76.0	76.2	1.40
1.50	69.6	70.2	70.7	71.2	71.7	72.1	72.5	72.8	73.1	73.4	73.7	74.0	74.2	74.5	74.7	74.9	75.1	75.3	75.5	75.6	75.8	1.50
1.60	68.8	69.4	70.0	70.5	71.0	71.4	71.8	72.2	72.6	72.9	73.2	73.5	73.7	74.0	74.2	74.4	74.6	74.8	75.0	75.2	75.4	1.60
1.70	68.0	68.7	69.3	69.8	70.3	70.8	71.2	71.6	72.0	72.3	72.6	72.9	73.2	73.5	73.7	74.0	74.2	74.4	74.6	74.8	75.0	1.70
1.80	67.2	67.9	68.5	69.1	69.6	70.1	70.6	71.0	71.4	71.8	72.1	72.4	72.7	73.0	73.2	73.5	73.7	73.9	74.2	74.4	74.5	1.80
1.90	66.4	67.1	67.8	68.4	68.9	69.5	69.9	70.4	70.8	71.2	71.5	71.9	72.2	72.5	72.8	73.0	73.3	73.5	73.7	73.9	74.1	1.90
2.00	65.5	66.3	67.0	67.7	68.3	68.8	69.3	69.8	70.2	70.6	71.0	71.3	71.7	72.0	72.3	72.6	72.8	73.1	73.3	73.5	73.7	2.00
2.10	64.7	65.5	66.3	67.0	67.6	68.2	68.7	69.2	69.6	70.1	70.5	70.8	71.2	71.5	71.8	72.1	72.4	72.6	72.9	73.1	73.3	2.10
2.20	63.9	64.8	65.5	66.2	66.9	67.5	68.1	68.6	69.0	69.5	69.9	70.3	70.7	71.0	71.3	71.6	71.9	72.2	72.4	72.7	72.9	2.20
2.30	63.1	64.0	64.8	65.5	66.2	66.8	67.4	68.0	68.5	68.9	69.4	69.8	70.1	70.5	70.8	71.2	71.5	71.7	72.0	72.3	72.5	2.30
2.40	62.3	63.2	64.0	64.8	65.5	66.2	66.8	67.4	67.9	68.4	68.8	69.2	69.6	70.0	70.4	70.7	71.0	71.3	71.6	71.8	72.1	2.40
2.50	61.4	62.4	63.3	64.1	64.9	65.5	66.2	66.7	67.3	67.8	68.3	68.7	69.1	69.5	69.9	70.2	70.5	70.8	71.1	71.4	71.7	2.50
2.60	60.6	61.6	62.6	63.4	64.2	64.9	65.5	66.1	66.7	67.2	67.7	68.2	68.6	69.0	69.4	69.7	70.1	70.4	70.7	71.0	71.3	2.60
2.70	59.8	60.9	61.8	62.7	63.5	64.2	64.9	65.5	66.1	66.7	67.2	67.6	68.1	68.5	68.9	69.3	69.6	70.0	70.3	70.6	70.9	2.70
2.80	59.0	60.1	61.1	62.0	62.8	63.6	64.3	64.9	65.5	66.1	66.6	67.1	67.6	68.0	68.4	68.8	69.2	69.5	69.8	70.2	70.5	2.80
2.90	58.2	59.3	60.3	61.3	62.1	62.9	63.6	64.3	65.0	65.5	66.1	66.6	67.1	67.5	67.9	68.3	68.7	69.1	69.4	69.7	70.0	2.90
3.00	57.3	58.5	59.6	60.5	61.4	62.3	63.0	63.7	64.4	65.0	65.5	66.1	66.6	67.0	67.5	67.9	68.3	68.6	69.0	69.3	69.6	3.00
3.10	56.5	57.7	58.8	59.8	60.8	61.6	62.4	63.1	63.8	64.4	65.0	65.5	66.0	66.5	67.0	67.4	67.8	68.2	68.6	68.9	69.2	3.10
3.20	55.7	57.0	58.1	59.1	60.1	60.9	61.8	62.5	63.2	63.8	64.4	65.0	65.5	66.0	66.5	66.9	67.4	67.8	68.1	68.5	68.8	3.20
3.30	54.9	56.2	57.3	58.4	59.4	60.3	61.1	61.9	62.6	63.3	63.9	64.5	65.0	65.5	66.0	66.5	66.9	67.3	67.7	68.1	68.4	3.30
3.40	54.1	55.4	56.6	57.7	58.7	59.6	60.5	61.3	62.0	62.7	63.4	64.0	64.5	65.0	65.5	66.0	66.4	66.9	67.3	67.6	68.0	3.40
3.50	53.2	54.6	55.9	57.0	58.0	59.0	59.9	60.7	61.4	62.1	62.8	63.4	64.0	64.5	65.1	65.5	66.0	66.4	66.8	67.2	67.6	3.50
3.60	52.4	53.8	55.1	56.3	57.3	58.3	59.2	60.1	60.9	61.6	62.3	62.9	63.5	64.0	64.6	65.1	65.5	66.0	66.4	66.8	67.2	3.60
3.70	51.6	53.1	54.4	55.6	56.7	57.7	58.6	59.5	60.3	61.0	61.7	62.4	63.0	63.6	64.1	64.6	65.1	65.5	66.0	66.4	66.8	3.70
3.80	50.8	52.3	53.6	54.9	56.0	57.0	58.0	58.9	59.7	60.5	61.2	61.8	62.5	63.1	63.6	64.1	64.6	65.1	65.5	66.0	66.4	3.80
3.90	50.0	51.5	52.9	54.1	55.3	56.4	57.3	58.3	59.1	59.9	60.6	61.3	62.0	62.6	63.1	63.7	64.2	64.7	65.1	65.5	65.9	3.90
4.00	49.2	50.7	52.1	53.4	54.6	55.7	56.7	57.6	58.5	59.3	60.1	60.8	61.4	62.1	62.6	63.2	63.7	64.2	64.7	65.1	65.5	4.00
4.25	47.1	48.8	50.3	51.6	52.9	54.1	55.1	56.1	57.1	57.9	58.7	59.5	60.2	60.8	61.4	62.0	62.6	63.1	63.6	64.1	64.5	4.25
4.50	45.1	46.8	48.4	49.9	51.2	52.4	53.6	54.6	55.6	56.5	57.3	58.1	58.9	59.6	60.2	60.9	61.4	62.0	62.5	63.0	63.5	4.50
4.75	43.0	44.9	46.5	48.1	49.5	50.8	52.0	53.1	54.1	55.1	56.0	56.8	57.6	58.3	59.0	59.7	60.3	60.9	61.4	62.0	62.5	4.75
5.00	41.0	42.9	44.7	46.3	47.8	49.2	50.4	51.6	52.7	53.7	54.6	55.5	56.3	57.1	57.8	58.5	59.2	59.8	60.4	60.9	61.4	5.00
5.25	38.9	41.0	42.8	44.5	46.1	47.5	48.8	50.1	51.2	52.3	53.2	54.2	55.0	55.9	56.6	57.3	58.0	58.7	59.3	59.9	60.4	5.25
5.50	36.9	39.0	41.0	42.7	44.4	45.9	47.3	48.5	49.7	50.8	51.9	52.9	53.8	54.6	55.4	56.2	56.9	57.6	58.2	58.8	59.4	5.50
5.75	34.8	37.1	39.1	41.0	42.7	44.2	45.7	47.0	48.3	49.4	50.5	51.5	52.5	53.4	54.2	55.0	55.8	56.5	57.1	57.8	58.4	5.75
6.00	32.8	35.1	37.2	39.2	41.0	42.6	44.1	45.5	46.8	48.0	49.2	50.2	51.2	52.1	53.0	53.8	54.6	55.4	56.1	56.7	57.3	6.00
6.25	30.7	33.2	35.4	37.4	39.3	41.0	42.5	44.0	45.3	46.6	47.8	48.9	49.9	50.9	51.8	52.7	53.5	54.2	55.0	55.7	56.3	6.25
6.50	28.7	31.2	33.5	35.6	37.5	39.3	41.0	42.5	43.9	45.2	46.4	47.6	48.6	49.6	50.6	51.5	52.3	53.1	53.9	54.6	55.3	6.50
6.75	26.6	29.3	31.7	33.8	35.8	37.7	39.4	41.0	42.4	43.8	45.1	46.2	47.4	48.4	49.4	50.3	51.2	52.0	52.8	53.6	54.3	6.75
7.00	24.6	27.3	29.8	32.1	34.1	36.0	37.8	39.4	41.0	42.4	43.7	44.9	46.1	47.2	48.2	49.2	50.1	50.9	51.7	52.5	53.2	7.00
7.25	22.5	25.4	27.9	30.3	32.4	34.4	36.2	37.9	39.5	41.0	42.3	43.6	44.8	45.9	47.0	48.0	48.9	49.8	50.7	51.5	52.2	7.25
7.50	20.5	23.4	26.1	28.5	30.7	32.8	34.7	36.4	38.0	39.5	41.0	42.3	43.5	44.7	45.8	46.8	47.8	48.7	49.6	50.4	51.2	7.50
7.75	18.4	21.5	24.2	26.7	29.0	31.1	33.1	34.9	36.6	38.1	39.6	41.0	42.2	43.4	44.6	45.6	46.6	47.6	48.5	49.4	50.2	7.75
8.00	16.4	19.5	22.3	24.9	27.3	29.5	31.5	33.4	35.1	36.7	38.2	39.6	41.0	42.2	43.4	44.5	45.5	46.5	47.4	48.3	49.2	8.00
8.50	12.3	15.6	18.6	21.4	23.9	26.2	28.4	30.3	32.2	33.9	35.5	37.0	38.4	39.7	41.0	42.1	43.2	44.3	45.3	46.2	47.1	8.50
9.00	8.2	11.7	14.9	17.8	20.5	22.9	25.2	27.3	29.3	31.1	32.8	34.4	35.8	37.2	38.6	39.8	41.0	42.1	43.1	44.1	45.1	9.00
9.50	4.1	7.8	11.2	14.2	17.1	19.7	22.1	24.3	26.3	28.2	30.0	31.7	33.3	34.8	36.1	37.4	38.7	39.9	41.0	42.0	43.0	9.50
10.00	0.0	3.9	7.4	10.7	13.7	16.4	18.9	21.2	23.4	25.4	27.3	29.1	30.7	32.3	33.7	35.1	36.4	37.6	38.8	39.9	41.0	10.00
10.50	-	0.0	3.7	7.1	10.2	13.1	15.8	18.2	20.5	22.6	24.6	26.4	28.2	29.8	31.3	32.8	34.1	35.4	36.6	37.8	38.9	10.50
11.00	-	-	0.0	3.6	6.8	9.8	12.6	15.2	17.6	19.8	21.8	23.8	25.7	27.3	28.9	30.4	31.9	33.2	34.5	35.7	36.9	11.00
11.50	-	-	-	0.0	3.4	6.6	9.5	12.1	14.6	16.9	19.1	21.1	23.0	24.8	26.5	28.1	29.6	31.0	32.3	33.6	34.8	11.50
12.00	-	-	-	-	0.0	3.3	6.3	9.1	11.7	14.1	16.4	18.5	20.5	22.3	24.1	25.7	27.3	28.8	30.2	31.5	32.8	12.00
12.50	-	-	-	-	-	0.0	3.2	6.1	8.8	11.3	13.7	15.9	17.9	19.9	21.7	23.4	25.0	26.6	28.0	29.4	30.7	12.50
13.00	-	-	-	-	-	-	0.0	3.0	5.9	8.5	10.9	13.2	15.4	17.4	19.3	21.1	22.8	24.4	25.9	27.3	28.7	13.00
13.50	-	-	-	-	-	-	-	0.0	2.9	5.6	8.2	10.6	12.8	14.9	16.9	18.7	20.5	22.1	23.7	25.2	26.6	13.50
14.00	-	-	-	-	-	-	-	-	0.0	2.8	5.5	7.9	10.2	12.4	14.5	16.4	18.2	19.9	21.6	23.1	24.6	14.00
14.50	-	-	-	-	-	-	-	-	-	0.0	2.7	5.3	7.7	9.9	12.0	14.0	15.9	17.7	19.4	21.0	22.5	14.50
15.00	-	-	-	-	-	-	-	-	-	-	0.0	2.6	5.1	7.4	9.6	11.7	13.7	15.5	17.2	18.9	20.5	15.00
15.50	-	-	-	-	-	-	-	-	-	-	-	0.0	2.6	5.0	7.2	9.4	11.4	13.3	15.1	16.8	18.4	15.50
16.00	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.5	4.8	7.0	9.1	11.1	12.9	14.7	16.4	16.00
16.50	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.4	4.7	6.8	8.9	10.8	12.6	14.3	16.50
17.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.3	4.6	6.6	8.6	10.5	12.3	17.00
17.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.3	4.4	6.5	8.4	10.2	17.50
18.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.2	4.3	6.3	8.2	18.00
18.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.2	4.2	6.1	18.50
19.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.1	4.1	19.00
19.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	2.0	19.50
20.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	20.00
	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	

original extract (%)

Alcohol Content (wt %)

apparent extract (%)	original extract (%)																					apparent extract (%)
	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	
1.00	3.8	4.0	4.2	4.4	4.6	4.9	5.1	5.3	5.6	5.8	6.0	6.2	6.5	6.7	7.0	7.2	7.4	7.7	7.9	8.2	8.4	1.00
1.10	3.7	3.9	4.2	4.4	4.6	4.8	5.1	5.3	5.5	5.7	6.0	6.2	6.4	6.7	6.9	7.1	7.4	7.6	7.9	8.1	8.4	1.10
1.20	3.7	3.9	4.1	4.3	4.6	4.8	5.0	5.2	5.5	5.7	5.9	6.2	6.4	6.6	6.9	7.1	7.3	7.6	7.8	8.1	8.3	1.20
1.30	3.6	3.9	4.1	4.3	4.5	4.7	5.0	5.2	5.4	5.7	5.9	6.1	6.4	6.6	6.8	7.1	7.3	7.5	7.8	8.0	8.3	1.30
1.40	3.6	3.8	4.0	4.3	4.5	4.7	4.9	5.2	5.4	5.6	5.8	6.1	6.3	6.5	6.8	7.0	7.3	7.5	7.7	8.0	8.2	1.40
1.50	3.6	3.8	4.0	4.2	4.4	4.7	4.9	5.1	5.3	5.6	5.8	6.0	6.3	6.5	6.7	7.0	7.2	7.5	7.7	7.9	8.2	1.50
1.60	3.5	3.7	4.0	4.2	4.4	4.6	4.8	5.1	5.3	5.5	5.8	6.0	6.2	6.5	6.7	6.9	7.2	7.4	7.6	7.9	8.1	1.60
1.70	3.5	3.7	3.9	4.1	4.4	4.6	4.8	5.0	5.3	5.5	5.7	5.9	6.2	6.4	6.6	6.9	7.1	7.4	7.6	7.8	8.1	1.70
1.80	3.4	3.6	3.9	4.1	4.3	4.5	4.8	5.0	5.2	5.4	5.7	5.9	6.1	6.4	6.6	6.8	7.1	7.3	7.6	7.8	8.0	1.80
1.90	3.4	3.6	3.8	4.0	4.3	4.5	4.7	4.9	5.2	5.4	5.6	5.9	6.1	6.3	6.6	6.8	7.0	7.3	7.5	7.8	8.0	1.90
2.00	3.3	3.6	3.8	4.0	4.2	4.4	4.7	4.9	5.1	5.4	5.6	5.8	6.0	6.3	6.5	6.8	7.0	7.2	7.5	7.7	8.0	2.00
2.10	3.3	3.5	3.7	4.0	4.2	4.4	4.6	4.9	5.1	5.3	5.5	5.8	6.0	6.2	6.5	6.7	6.9	7.2	7.4	7.7	7.9	2.10
2.20	3.3	3.5	3.7	3.9	4.1	4.4	4.6	4.8	5.0	5.3	5.5	5.7	6.0	6.2	6.4	6.7	6.9	7.1	7.4	7.6	7.9	2.20
2.30	3.2	3.4	3.7	3.9	4.1	4.3	4.5	4.8	5.0	5.2	5.5	5.7	5.9	6.2	6.4	6.6	6.9	7.1	7.3	7.6	7.8	2.30
2.40	3.2	3.4	3.6	3.8	4.1	4.3	4.5	4.7	5.0	5.2	5.4	5.6	5.9	6.1	6.3	6.6	6.8	7.1	7.3	7.5	7.8	2.40
2.50	3.1	3.4	3.6	3.8	4.0	4.2	4.5	4.7	4.9	5.1	5.4	5.6	5.8	6.1	6.3	6.5	6.8	7.0	7.3	7.5	7.7	2.50
2.60	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.6	4.9	5.1	5.3	5.6	5.8	6.0	6.3	6.5	6.7	7.0	7.2	7.4	7.7	2.60
2.70	3.1	3.3	3.5	3.7	3.9	4.2	4.4	4.6	4.8	5.1	5.3	5.5	5.7	6.0	6.2	6.4	6.7	6.9	7.2	7.4	7.6	2.70
2.80	3.0	3.2	3.4	3.7	3.9	4.1	4.3	4.6	4.8	5.0	5.2	5.5	5.7	5.9	6.2	6.4	6.6	6.9	7.1	7.4	7.6	2.80
2.90	3.0	3.2	3.4	3.6	3.8	4.1	4.3	4.5	4.7	5.0	5.2	5.4	5.7	5.9	6.1	6.4	6.6	6.8	7.1	7.3	7.6	2.90
3.00	2.9	3.1	3.4	3.6	3.8	4.0	4.2	4.5	4.7	4.9	5.2	5.4	5.6	5.8	6.1	6.3	6.6	6.8	7.0	7.3	7.5	3.00
3.10	2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.7	4.9	5.1	5.3	5.6	5.8	6.0	6.3	6.5	6.7	7.0	7.2	7.5	3.10
3.20	2.8	3.1	3.3	3.5	3.7	3.9	4.2	4.4	4.6	4.8	5.1	5.3	5.5	5.8	6.0	6.2	6.5	6.7	6.9	7.2	7.4	3.20
3.30	2.8	3.0	3.2	3.5	3.7	3.9	4.1	4.3	4.6	4.8	5.0	5.3	5.5	5.7	6.0	6.2	6.4	6.7	6.9	7.1	7.4	3.30
3.40	2.8	3.0	3.2	3.4	3.6	3.9	4.1	4.3	4.5	4.8	5.0	5.2	5.4	5.7	5.9	6.1	6.4	6.6	6.9	7.1	7.3	3.40
3.50	2.7	2.9	3.2	3.4	3.6	3.8	4.0	4.3	4.5	4.7	4.9	5.2	5.4	5.6	5.9	6.1	6.3	6.6	6.8	7.1	7.3	3.50
3.60	2.7	2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.7	4.9	5.1	5.4	5.6	5.8	6.1	6.3	6.5	6.8	7.0	7.2	3.60
3.70	2.6	2.9	3.1	3.3	3.5	3.7	4.0	4.2	4.4	4.6	4.9	5.1	5.3	5.5	5.8	6.0	6.2	6.5	6.7	7.0	7.2	3.70
3.80	2.6	2.8	3.0	3.2	3.5	3.7	3.9	4.1	4.4	4.6	4.8	5.0	5.3	5.5	5.7	6.0	6.2	6.4	6.7	6.9	7.2	3.80
3.90	2.5	2.8	3.0	3.2	3.4	3.6	3.9	4.1	4.3	4.5	4.8	5.0	5.2	5.5	5.7	5.9	6.2	6.4	6.6	6.9	7.1	3.90
4.00	2.5	2.7	2.9	3.2	3.4	3.6	3.8	4.0	4.3	4.5	4.7	5.0	5.2	5.4	5.6	5.9	6.1	6.4	6.6	6.8	7.1	4.00
4.25	2.4	2.6	2.8	3.1	3.3	3.5	3.7	3.9	4.2	4.4	4.6	4.8	5.1	5.3	5.5	5.8	6.0	6.2	6.5	6.7	7.0	4.25
4.50	2.3	2.5	2.7	3.0	3.2	3.4	3.6	3.8	4.1	4.3	4.5	4.7	5.0	5.2	5.4	5.7	5.9	6.1	6.4	6.6	6.9	4.50
4.75	2.2	2.4	2.6	2.8	3.1	3.3	3.5	3.7	4.0	4.2	4.4	4.6	4.9	5.1	5.3	5.6	5.8	6.0	6.3	6.5	6.7	4.75
5.00	2.1	2.3	2.5	2.7	3.0	3.2	3.4	3.6	3.8	4.1	4.3	4.5	4.8	5.0	5.2	5.4	5.7	5.9	6.2	6.4	6.6	5.00
5.25	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.7	4.0	4.2	4.4	4.6	4.9	5.1	5.3	5.6	5.8	6.0	6.3	6.5	5.25
5.50	1.9	2.1	2.3	2.5	2.7	3.0	3.2	3.4	3.6	3.9	4.1	4.3	4.5	4.8	5.0	5.2	5.5	5.7	5.9	6.2	6.4	5.50
5.75	1.8	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.7	4.0	4.2	4.4	4.7	4.9	5.1	5.4	5.6	5.8	6.1	6.3	5.75
6.00	1.7	1.9	2.1	2.3	2.5	2.8	3.0	3.2	3.4	3.6	3.9	4.1	4.3	4.5	4.8	5.0	5.2	5.5	5.7	6.0	6.2	6.00
6.25	1.6	1.8	2.0	2.2	2.4	2.6	2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.4	4.7	4.9	5.1	5.4	5.6	5.8	6.1	6.25
6.50	1.5	1.7	1.9	2.1	2.3	2.5	2.8	3.0	3.2	3.4	3.7	3.9	4.1	4.3	4.6	4.8	5.0	5.3	5.5	5.7	6.0	6.50
6.75	1.4	1.6	1.8	2.0	2.2	2.4	2.7	2.9	3.1	3.3	3.5	3.8	4.0	4.2	4.5	4.7	4.9	5.1	5.4	5.6	5.9	6.75
7.00	1.3	1.5	1.7	1.9	2.1	2.3	2.5	2.8	3.0	3.2	3.4	3.7	3.9	4.1	4.3	4.6	4.8	5.0	5.3	5.5	5.7	7.00
7.25	1.1	1.4	1.6	1.8	2.0	2.2	2.4	2.7	2.9	3.1	3.3	3.6	3.8	4.0	4.2	4.5	4.7	4.9	5.2	5.4	5.6	7.25
7.50	1.0	1.3	1.5	1.7	1.9	2.1	2.3	2.6	2.8	3.0	3.2	3.4	3.7	3.9	4.1	4.4	4.6	4.8	5.1	5.3	5.5	7.50
7.75	0.9	1.2	1.4	1.6	1.8	2.0	2.2	2.5	2.7	2.9	3.1	3.3	3.6	3.8	4.0	4.2	4.5	4.7	4.9	5.2	5.4	7.75
8.00	0.8	1.0	1.3	1.5	1.7	1.9	2.1	2.3	2.6	2.8	3.0	3.2	3.5	3.7	3.9	4.1	4.4	4.6	4.8	5.1	5.3	8.00
8.50	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.4	2.6	2.8	3.0	3.2	3.5	3.7	3.9	4.2	4.4	4.6	4.8	5.1	8.50
9.00	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.4	2.6	2.8	3.0	3.2	3.5	3.7	3.9	4.2	4.4	4.6	4.9	9.00
9.50	0.2	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.4	2.6	2.8	3.0	3.3	3.5	3.7	3.9	4.2	4.4	4.6	9.50
10.00	0.0	0.2	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.1	2.4	2.6	2.8	3.0	3.3	3.5	3.7	4.0	4.2	4.4	10.00
10.50	-	0.0	0.2	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.2	2.4	2.6	2.8	3.1	3.3	3.5	3.7	4.0	4.2	10.50
11.00	-	-	0.0	0.2	0.4	0.6	0.8	1.1	1.3	1.5	1.7	1.9	2.2	2.4	2.6	2.8	3.1	3.3	3.5	3.7	4.0	11.00
11.50	-	-	-	0.0	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.7	1.9	2.2	2.4	2.6	2.8	3.1	3.3	3.5	3.8	11.50
12.00	-	-	-	-	0.0	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.7	1.9	2.2	2.4	2.6	2.8	3.1	3.3	3.5	12.00
12.50	-	-	-	-	-	0.0	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.7	2.0	2.2	2.4	2.6	2.9	3.1	3.3	12.50
13.00	-	-	-	-	-	-	0.0	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.7	2.0	2.2	2.4	2.6	2.9	3.1	13.00
13.50	-	-	-	-	-	-	-	0.0	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.7	2.0	2.2	2.4	2.6	2.9	13.50
14.00	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.7	2.0	2.2	2.4	2.7	14.00
14.50	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.8	2.0	2.2	2.4	14.50
15.00	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.6	0.9	1.1	1.3	1.5	1.8	2.0	2.2	15.00
15.50	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	2.0	15.50
16.00	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.7	0.9	1.1	1.3	1.5	1.8	16.00
16.50	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.7	0.9	1.1	1.3	1.5	16.50
17.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.7	0.9	1.1	1.3	17.00
17.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.7	0.9	1.1	17.50
18.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.7	0.9	18.00
18.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	0.7	18.50
19.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	0.4	19.00
19.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.2	19.50
20.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	20.00
	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0	
	original extract (%)																					