

batch number 3		batch name Narziss Helles Die Beerery Kubessa Verfahren				beer style Helles		brew date 11/11/2015			
water treatment								result			
water source 1 RO				%		100		water source 2 NA			
strike water 5 gal				CaSO ₄ 2H ₂ O 1 g		NaCl 0 g		MgSO ₄ 7H ₂ O 1 g			
sparge water 6.65 gal				CaSO ₄ 2H ₂ O 1.33 g		NaCl 0 g		MgSO ₄ 7H ₂ O 1.33 g			
				CaCl ₂ 2H ₂ O 0 g		NaHCO ₃ 0 g		CaCO ₃ 0 g			
				Acid 1.5 Lactic ml							
				Na ⁺ 3 ppm		SO ₄ ²⁻ 21.6 ppm		residual alkalinity -96 ppm HCO ₃			
				Cr 36.8 ppm		HCO ₃ ⁻ -55 ppm		Alkalinity -61 ppm			
mg/l residual Alkalinity HCO₃⁻ residual alkalinity dH (RA) mg/l HCO₃⁻ dH (KH) mg/l Mg dH (Mg) mg/l Ca dH (Ca) strike water pH <table border="1" style="width: 100%;"> <tr> <td>before</td> <td>after</td> </tr> </table>								before	after	$RA = KH - \frac{CH + 0.5MH}{3.5}$ 1 dH (KH) = 21,7 ppm HCO₃⁻ 1 dH (MH) = 4.33 ppm Mg 1 dH (CH) = 7.14 ppm Ca	
								before	after		
grist						Conditioning					
amount 9 lb 7.4 oz	% 96.7	type Barke Pilsner	maltster Weyermann	mill gap mil	liquid type		RO				
amount 3.1 oz	% 2	type Carahell	maltster Weyermann	mill gap mil	amount used						
amount 2.1 oz	% 1.3	type CaraMunich II	maltster Weyermann	mill gap mil	rest time						
amount	%	type	maltster	mill gap mil	mill gap						
amount	%	type	maltster	mill gap mil							
amount	%	type	maltster	mill gap mil							
total					Minerals added to grain ☐ Check hoses and valves ☐ acid added to strike ☐						
hops/spices/other											
amount .29 oz	a.-acid 9.20	IBU 7.5	boil time 60 min	type Perle Pellet							
amount .22 oz	a.-acid 9.20	IBU 4.4	boil time 30 min	type Perle Pellet							
amount .40 oz	a.-acid 6.30	IBU 3.5	boil time 15 min	type Mittelfruh Pellet							
amount 1 tab	a.-acid	IBU	boil time 10 min	type Whirlfloc							
amount 1 tsp	a.-acid	IBU	boil time 10 min	type Irish Moss							
amount 1 tsp	a.-acid	IBU	boil time 10 min	type Wyeast Nutrient							
		total IBU 15.3	IBU formula: ☒ Tinseth ☐ Rager ☐ Garetz ☐ Other _____								
yeast											
type (strain) 833/2206 Blend			propagation Re-pitch			pitch amount Slurry					





batch number		batch name	
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date	aroma	appearance	taste
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	hops none strong malt none strong other none strong aroma ____/12	clarity none strong head none strong appearance ____/3	bitter none strong sweet none strong mouthfeel none strong carbonation none strong flavor ____/20 mouthfeel ____/5 overall ____/10 total ____/50
suggested improvements			

		Apparent attenuation																					
		starting gravity																					
		1.040	1.042	1.044	1.046	1.048	1.050	1.052	1.054	1.056	1.058	1.060	1.062	1.064	1.066	1.068	1.070	1.072	1.074	1.076	1.078	1.080	
current gravity	1.0040	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	1.0
	1.0045	88.8	89.3	89.8	90.2	90.6	91.0	91.3	91.7	92.0	92.2	92.5	92.7	93.0	93.2	93.4	93.6	93.8	93.9	94.1	94.2	94.4	1.2
	1.0050	87.5	88.1	88.6	89.1	89.6	90.0	90.4	90.7	91.1	91.4	91.7	91.9	92.2	92.4	92.6	92.9	93.1	93.2	93.4	93.6	93.8	1.3
	1.0055	86.2	86.9	87.5	88.0	88.5	89.0	89.4	89.8	90.2	90.5	90.8	91.1	91.4	91.7	91.9	92.1	92.4	92.6	92.8	92.9	93.1	1.4
	1.0060	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	1.5
	1.0065	83.8	84.5	85.2	85.9	86.5	87.0	87.5	88.0	88.4	88.8	89.2	89.5	89.8	90.2	90.4	90.7	91.0	91.2	91.4	91.7	91.9	1.7
	1.0070	82.5	83.3	84.1	84.8	85.4	86.0	86.5	87.0	87.5	87.9	88.3	88.7	89.1	89.4	89.7	90.0	90.3	90.5	90.8	91.0	91.3	1.8
	1.0075	81.2	82.1	83.0	83.7	84.4	85.0	85.6	86.1	86.6	87.1	87.5	87.9	88.3	88.6	89.0	89.3	89.6	89.9	90.1	90.4	90.6	1.9
	1.0080	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	2.1
	1.0085	78.8	79.8	80.7	81.5	82.3	83.0	83.7	84.3	84.8	85.3	85.8	86.3	86.7	87.1	87.5	87.9	88.2	88.5	88.8	89.1	89.4	2.2
	1.0090	77.5	78.6	79.5	80.4	81.3	82.0	82.7	83.3	83.9	84.5	85.0	85.5	85.9	86.4	86.8	87.1	87.5	87.8	88.2	88.5	88.8	2.3
	1.0095	76.2	77.4	78.4	79.3	80.2	81.0	81.7	82.4	83.0	83.6	84.2	84.7	85.2	85.6	86.0	86.4	86.8	87.2	87.5	87.8	88.1	2.4
	1.0100	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	2.6
	1.0105	73.8	75.0	76.1	77.2	78.1	79.0	79.8	80.6	81.3	81.9	82.5	83.1	83.6	84.1	84.6	85.0	85.4	85.8	86.2	86.5	86.9	2.7
	1.0110	72.5	73.8	75.0	76.1	77.1	78.0	78.8	79.6	80.4	81.0	81.7	82.3	82.8	83.3	83.8	84.3	84.7	85.1	85.5	85.9	86.3	2.8
	1.0115	71.2	72.6	73.9	75.0	76.0	77.0	77.9	78.7	79.5	80.2	80.8	81.5	82.0	82.6	83.1	83.6	84.0	84.5	84.9	85.3	85.6	2.9
	1.0120	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	3.1
	1.0125	68.8	70.2	71.6	72.8	74.0	75.0	76.0	76.9	77.7	78.4	79.2	79.8	80.5	81.1	81.6	82.1	82.6	83.1	83.6	84.0	84.4	3.2
	1.0130	67.5	69.0	70.5	71.7	72.9	74.0	75.0	75.9	76.8	77.6	78.3	79.0	79.7	80.3	80.9	81.4	81.9	82.4	82.9	83.3	83.8	3.3
	1.0135	66.2	67.9	69.3	70.7	71.9	73.0	74.0	75.0	75.9	76.7	77.5	78.2	78.9	79.5	80.1	80.7	81.2	81.8	82.2	82.7	83.1	3.4
	1.0140	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	3.6
	1.0145	63.8	65.5	67.0	68.5	69.8	71.0	72.1	73.1	74.1	75.0	75.8	76.6	77.3	78.0	78.7	79.3	79.9	80.4	80.9	81.4	81.9	3.7
	1.0150	62.5	64.3	65.9	67.4	68.8	70.0	71.2	72.2	73.2	74.1	75.0	75.8	76.6	77.3	77.9	78.6	79.2	79.7	80.3	80.8	81.3	3.8
	1.0155	61.2	63.1	64.8	66.3	67.7	69.0	70.2	71.3	72.3	73.3	74.2	75.0	75.8	76.5	77.2	77.9	78.5	79.1	79.6	80.1	80.6	3.9
	1.0160	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	4.1
	1.0165	58.8	60.7	62.5	64.1	65.6	67.0	68.3	69.4	70.5	71.6	72.5	73.4	74.2	75.0	75.7	76.4	77.1	77.7	78.3	78.8	79.4	4.2
	1.0170	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	4.3
	1.0175	56.2	58.3	60.2	62.0	63.5	65.0	66.3	67.6	68.7	69.8	70.8	71.8	72.7	73.5	74.3	75.0	75.7	76.4	77.0	77.6	78.1	4.5
	1.0180	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	4.6
	1.0185	53.8	56.0	58.0	59.8	61.5	63.0	64.4	65.7	67.0	68.1	69.2	70.2	71.1	72.0	72.8	73.6	74.3	75.0	75.7	76.3	76.9	4.7
	1.0190	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	4.8
	1.0200	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	5.1
1.0210	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	5.3	
1.0220	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	5.6	
1.0230	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	5.8	
1.0240	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	6.1	
1.0250	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	6.3	
1.0260	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	6.6	
1.0270	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	6.8	
1.0280	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	7.1	
1.0290	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	7.3	
1.0300	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	7.6	
1.0310	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	7.8	
1.0320	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	8.0	
1.0330	17.5	21.4	25.0	28.3	31.3	34.0	36.5	38.9	41.1	43.1	45.0	46.8	48.4	50.0	51.5	52.9	54.2	55.4	56.6	57.7	58.8	8.3	
1.0340	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	8.5	
1.0350	12.5	16.7	20.5	23.9	27.1	30.0	32.7	35.2	37.5	39.7	41.7	43.5	45.3	47.0	48.5	50.0	51.4	52.7	53.9	55.1	56.3	8.8	
1.0360	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	9.0	
1.0370	7.5	11.9	15.9	19.6	22.9	26.0	28.8	31.5	33.9	36.2	38.3	40.3	42.2	43.9	45.6	47.1	48.6	50.0	51.3	52.6	53.8	9.3	
1.0380	5.0	9.5	13.6	17.4	20.8	24.0	26.9	29.6	32.1	34.5	36.7	38.7											

		real attenuation																						
		starting gravity																						
		1.040	1.042	1.044	1.046	1.048	1.050	1.052	1.054	1.056	1.058	1.060	1.062	1.064	1.066	1.068	1.070	1.072	1.074	1.076	1.078	1.080		
current gravity	1.0040	73.8	74.2	74.5	74.9	75.2	75.4	75.7	75.9	76.1	76.3	76.5	76.7	76.9	77.0	77.2	77.3	77.4	77.6	77.7	77.8	77.9	1.0	apparent extract (Plato)
	1.0045	72.8	73.2	73.6	74.0	74.3	74.6	74.9	75.2	75.4	75.6	75.9	76.0	76.2	76.4	76.6	76.7	76.9	77.0	77.1	77.3	77.4	1.2	
	1.0050	71.8	72.2	72.7	73.1	73.5	73.8	74.1	74.4	74.7	74.9	75.2	75.4	75.6	75.8	76.0	76.1	76.3	76.5	76.6	76.7	76.9	1.3	
	1.0055	70.7	71.3	71.7	72.2	72.6	73.0	73.3	73.6	73.9	74.2	74.5	74.7	75.0	75.2	75.4	75.6	75.7	75.9	76.1	76.2	76.4	1.4	
	1.0060	69.7	70.3	70.8	71.3	71.8	72.2	72.5	72.9	73.2	73.5	73.8	74.1	74.3	74.5	74.8	75.0	75.2	75.4	75.5	75.7	75.9	1.5	
	1.0065	68.7	69.3	69.9	70.4	70.9	71.3	71.8	72.1	72.5	72.8	73.1	73.4	73.7	73.9	74.2	74.4	74.6	74.8	75.0	75.2	75.3	1.7	
	1.0070	67.7	68.3	69.0	69.5	70.0	70.5	71.0	71.4	71.8	72.1	72.4	72.7	73.0	73.3	73.6	73.8	74.0	74.2	74.4	74.6	74.8	1.8	
	1.0075	66.6	67.4	68.0	68.6	69.2	69.7	70.2	70.6	71.0	71.4	71.7	72.1	72.4	72.7	73.0	73.2	73.5	73.7	73.9	74.1	74.3	1.9	
	1.0080	65.6	66.4	67.1	67.7	68.3	68.9	69.4	69.9	70.3	70.7	71.1	71.4	71.8	72.1	72.4	72.6	72.9	73.1	73.4	73.6	73.8	2.1	
	1.0085	64.6	65.4	66.2	66.8	67.5	68.1	68.6	69.1	69.6	70.0	70.4	70.8	71.1	71.4	71.8	72.0	72.3	72.6	72.8	73.1	73.3	2.2	
	1.0090	63.6	64.4	65.2	66.0	66.6	67.2	67.8	68.3	68.8	69.3	69.7	70.1	70.5	70.8	71.1	71.5	71.8	72.0	72.3	72.5	72.8	2.3	
	1.0095	62.5	63.5	64.3	65.1	65.8	66.4	67.0	67.6	68.1	68.6	69.0	69.4	69.8	70.2	70.5	70.9	71.2	71.5	71.7	72.0	72.3	2.4	
	1.0100	61.5	62.5	63.4	64.2	64.9	65.6	66.2	66.8	67.4	67.9	68.3	68.8	69.2	69.6	69.9	70.3	70.6	70.9	71.2	71.5	71.8	2.6	
	1.0105	60.5	61.5	62.4	63.3	64.1	64.8	65.4	66.1	66.6	67.2	67.7	68.1	68.5	69.0	69.3	69.7	70.0	70.4	70.7	71.0	71.2	2.7	
	1.0110	59.5	60.5	61.5	62.4	63.2	64.0	64.7	65.3	65.9	66.4	67.0	67.5	67.9	68.3	68.7	69.1	69.5	69.8	70.1	70.4	70.7	2.8	
	1.0115	58.4	59.5	60.6	61.5	62.4	63.1	63.9	64.5	65.2	65.7	66.3	66.8	67.3	67.7	68.1	68.5	68.9	69.3	69.6	69.9	70.2	2.9	
	1.0120	57.4	58.6	59.6	60.6	61.5	62.3	63.1	63.8	64.4	65.0	65.6	66.1	66.6	67.1	67.5	67.9	68.3	68.7	69.1	69.4	69.7	3.1	
	1.0125	56.4	57.6	58.7	59.7	60.6	61.5	62.3	63.0	63.7	64.3	64.9	65.5	66.0	66.5	66.9	67.4	67.8	68.1	68.5	68.9	69.2	3.2	
	1.0130	55.4	56.6	57.8	58.8	59.8	60.7	61.5	62.3	63.0	63.6	64.2	64.8	65.3	65.8	66.3	66.8	67.2	67.6	68.0	68.3	68.7	3.3	
	1.0135	54.3	55.6	56.8	57.9	58.9	59.9	60.7	61.5	62.2	62.9	63.5	64.1	64.7	65.2	65.7	66.2	66.6	67.0	67.4	67.8	68.2	3.4	
	1.0140	53.3	54.7	55.9	57.0	58.1	59.0	59.9	60.7	61.5	62.2	62.9	63.5	64.1	64.6	65.1	65.6	66.1	66.5	66.9	67.3	67.7	3.6	
	1.0145	52.3	53.7	55.0	56.2	57.2	58.2	59.1	60.0	60.8	61.5	62.2	62.8	63.4	64.0	64.5	65.0	65.5	65.9	66.4	66.8	67.1	3.7	
	1.0150	51.3	52.7	54.0	55.3	56.4	57.4	58.3	59.2	60.0	60.8	61.5	62.2	62.8	63.4	63.9	64.4	64.9	65.4	65.8	66.2	66.6	3.8	
	1.0155	50.2	51.7	53.1	54.4	55.5	56.6	57.6	58.5	59.3	60.1	60.8	61.5	62.1	62.7	63.3	63.8	64.3	64.8	65.3	65.7	66.1	3.9	
	1.0160	49.2	50.8	52.2	53.5	54.7	55.8	56.8	57.7	58.6	59.4	60.1	60.8	61.5	62.1	62.7	63.3	63.8	64.3	64.7	65.2	65.6	4.1	
	1.0165	48.2	49.8	51.3	52.6	53.8	54.9	56.0	56.9	57.8	58.7	59.5	60.2	60.9	61.5	62.1	62.7	63.2	63.7	64.2	64.7	65.1	4.2	
	1.0170	47.2	48.8	50.3	51.7	53.0	54.1	55.2	56.2	57.1	58.0	58.8	59.5	60.2	60.9	61.5	62.1	62.6	63.2	63.7	64.1	64.6	4.3	
	1.0175	46.1	47.8	49.4	50.8	52.1	53.3	54.4	55.4	56.4	57.3	58.1	58.9	59.6	60.3	60.9	61.5	62.1	62.6	63.1	63.6	64.1	4.5	
	1.0180	45.1	46.9	48.5	49.9	51.3	52.5	53.6	54.7	55.6	56.6	57.4	58.2	58.9	59.6	60.3	60.9	61.5	62.1	62.6	63.1	63.6	4.6	
	1.0185	44.1	45.9	47.5	49.0	50.4	51.7	52.8	53.9	54.9	55.8	56.7	57.5	58.3	59.0	59.7	60.3	60.9	61.5	62.0	62.6	63.0	4.7	
	1.0190	43.1	44.9	46.6	48.1	49.5	50.8	52.0	53.1	54.2	55.1	56.0	56.9	57.7	58.4	59.1	59.7	60.4	60.9	61.5	62.0	62.5	4.8	
	1.0200	41.0	43.0	44.7	46.3	47.8	49.2	50.5	51.6	52.7	53.7	54.7	55.5	56.4	57.2	57.9	58.6	59.2	59.8	60.4	61.0	61.5	5.1	
1.0210	39.0	41.0	42.9	44.6	46.1	47.6	48.9	50.1	51.3	52.3	53.3	54.2	55.1	55.9	56.7	57.4	58.1	58.7	59.3	59.9	60.5	5.3		
1.0220	36.9	39.0	41.0	42.8	44.4	45.9	47.3	48.6	49.8	50.9	51.9	52.9	53.8	54.7	55.5	56.2	56.9	57.6	58.3	58.9	59.5	5.6		
1.0230	34.9	37.1	39.1	41.0	42.7	44.3	45.7	47.1	48.3	49.5	50.6	51.6	52.5	53.4	54.3	55.1	55.8	56.5	57.2	57.8	58.4	5.8		
1.0240	32.8	35.1	37.3	39.2	41.0	42.6	44.2	45.6	46.9	48.1	49.2	50.3	51.3	52.2	53.1	53.9	54.7	55.4	56.1	56.8	57.4	6.1		
1.0250	30.8	33.2	35.4	37.4	39.3	41.0	42.6	44.0	45.4	46.7	47.8	48.9	50.0	50.9	51.9	52.7	53.5	54.3	55.0	55.7	56.4	6.3		
1.0260	28.7	31.2	33.5	35.7	37.6	39.4	41.0	42.5	43.9	45.2	46.5	47.6	48.7	49.7	50.6	51.5	52.4	53.2	53.9	54.7	55.4	6.6		
1.0270	26.7	29.3	31.7	33.9	35.9	37.7	39.4	41.0	42.5	43.8	45.1	46.3	47.4	48.5	49.4	50.4	51.3	52.1	52.9	53.6	54.3	6.8		
1.0280	24.6	27.3	29.8	32.1	34.2	36.1	37.8	39.5	41.0	42.4	43.7	45.0	46.1	47.2	48.2	49.2	50.1	51.0	51.8	52.6	53.3	7.1		
1.0290	22.6	25.4	28.0	30.3	32.5	34.4	36.3	38.0	39.5	41.0	42.4	43.6	44.8	46.0	47.0	48.0	49.0	49.9	50.7	51.5	52.3	7.3		
1.0300	20.5	23.4	26.1	28.5	30.8	32.8	34.7	36.4	38.1	39.6	41.0	42.3	43.6	44.7	45.8	46.9	47.8	48.8	49.6	50.5	51.3	7.6		
1.0310	18.5	21.5	24.2	26.7	29.0	31.2	33.1	34.9	36.6	38.2	39.6	41.0	42.3	43.5	44.6	45.7	46.7	47.6	48.6	49.4	50.2	7.8		
1.0320	16.4	19.5	22.4	25.0	27.3	29.5	31.5	33.4	35.1	36.8	38.3	39.7	41.0	42.2	43.4	44.5	45.6	46.5	47.5	48.4	49.2	8.0		
1.0330	14.4	17.6	20.5	23.2	25.6	27.9	30.0	31.9	33.7	35.3	36.9	38.4	39.7	41.0	42.2	43.3	44.4	45.4	46.4	47.3	48.2	8.3		
1.0340	12.3	15.6	18.6	21.4	23.9	26.2	28.4	30.4	32.2	33.9	35.5	37.0	38.4	39.8	41.0	42.2	43.3	44.3	45.3	46.3	47.2	8.5		
1.0350	10.3	13.7	16.8	19.6	22.2	24.6	26.8	28.9	30.8	32.5	34.2	35.7	37.2	38.5	39.8	41.0	42.1	43.2	44.2	45.2	46.1	8.8		
1.0360	8.2	11.7	14.9	17.8	20.5	23.0	25.2	27.3	29.3	31.1	32.8	34.4	35.9	37.3	38.6	39.8	41.0	42.1	43.2	44.2	45.1	9.0		
1.0370	6.2	9.8	13.0	16.0	18.8	21.3	23.7	25.8	27.8	29.7	31.4	33.1	34.6	36.0	37.4	38.7	39.9	41.0	42.1	43.1	44.1	9.3		
1.0380	4.1	7.8	11.2	14.3	17.1	19.7	22.1	24.3	26.4	28.3	30.1	31.7	33.3	34.8	36.2	37.5	38.7	39.9	41.0	42.1	43.1	9.5		
1.0400	0.0	3.9	7.5	10.7	13.7	16.4	18.9	21.3	23.4	25.4	27.3	29.1	30.8	32.3	33.8	35.1	36.4	37.7	38					