

Supplementary Online Content

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eTable. Detailed Data of Disparity of 100 Eyes Calculated Using the Existing IOL Formulas and the Super Formula

This supplementary material has been provided by the authors to give readers additional information about their work

eTable. Detailed Data of Disparity of 100 Eyes Calculated Using the Existing IOL Formulas and the Super Formula*

Eyes					Super Formul a	PINK is > 0.5 D and PURPLE is > 1.0 D disparity from Super Formula				
#	Axial Length (mm)	K1 (D)^a	K2 (D)	Avg K (D)		Hoffer Q	Hollad ay I	Koch Adj.^b	Haigis	SRK/T
1	32.56	43.94	46.46	45.20	-4.49	-6.00	-5.28	-3.55	-4.49	-6.12 ^c
2	25.12	41.69	42.81	42.25	15.15	14.59	14.83	15.15	15.24	14.45
3	25.47	42.09	42.58	42.34	14.26	13.60	13.83	14.26	14.20	13.51
4	23.12	43.98	45.10	44.54	17.56	17.36	17.56	17.13	18.03	17.33
5	23.26	44.48	46.23	45.36	16.29	16.00	16.29	15.92	16.75	16.20
6	23.55	45.29	47.59	46.44	14.29	13.85	14.29	14.03	15.16	14.42
7	22.97	43.02	44.11	43.57	19.01	18.93	19.01	18.52	19.64	18.63
8	25.84	45.53	45.62	45.58	9.62	8.53	9.05	9.62	8.90	9.24
9	25.65	43.75	44.79	44.27	11.64	10.71	11.14	11.64	10.99	11.09
10	22.37	43.92	45.09	44.51	19.75	19.67	19.75	18.99	20.60	19.37
11	22.34	42.00	44.95	43.48	20.91	20.91	20.91	20.14	21.80	20.39
12	24.12	41.25	44.43	42.84	16.69	16.53	16.69	16.66	17.42	16.43
13	28.09	37.96	39.59	38.78	12.31	11.94	11.29	12.31	12.67	11.38
14	23.46	42.92	43.11	43.02	18.24	18.15	18.24	17.96	18.95	17.89
15	23.38	43.19	43.73	43.46	17.99	17.86	17.99	17.67	18.66	17.67
16	24.28	44.66	45.55	45.11	13.80	13.36	13.80	13.83	13.97	13.83
17	24.30	44.37	45.09	44.73	14.17	13.76	14.17	14.20	14.38	14.14
18	25.75	41.64	42.47	42.06	13.87	13.24	13.36	13.87	13.88	13.11
19	22.17	47.71	47.94	47.83	16.81	16.53	16.81	15.93	17.80	16.89
20	22.97	43.49	43.61	43.55	19.03	18.95	19.03	18.54	19.58	18.64
21	23.43	42.97	43.45	43.21	18.12	18.01	18.12	17.82	18.92	17.78
22	23.83	40.76	41.00	40.88	19.49	19.60	19.49	19.35	20.42	18.97
23	24.13	41.42	41.47	41.45	18.14	18.14	18.14	18.11	18.83	17.73
24	24.41	42.38	42.65	42.52	16.29	16.13	16.29	16.37	18.10	15.99
25	22.69	44.60	44.94	44.77	18.54	18.39	18.54	17.92	19.15	18.26
26	24.82	42.81	44.04	43.43	14.28	13.94	14.28	14.50	14.13	14.05
27	24.68	42.63	43.30	42.97	15.13	14.87	15.13	15.30	15.48	14.86
28	22.82	44.86	45.45	45.16	17.76	17.55	17.76	17.19	18.50	17.55
29	22.84	44.90	45.61	45.26	17.59	17.38	17.59	17.04	18.06	17.41
30	24.55	43.17	43.74	43.46	14.93	14.63	14.93	15.05	15.19	14.72
31	24.52	43.23	43.86	43.55	14.90	14.60	14.90	15.02	16.00	14.71
32	24.36	41.88	42.74	42.31	16.64	16.51	16.64	16.70	17.03	16.32
33	24.30	42.12	43.28	42.70	16.38	16.21	16.38	16.41	16.72	16.10
34	26.89	42.83	44.35	43.59	9.40	8.47	8.58	9.40	8.99	8.82
35	24.01	44.58	45.93	45.26	14.35	13.94	14.35	14.28	14.44	14.39
36	22.12	44.55	45.15	44.85	20.14	20.06	20.14	19.26	20.77	19.75
37	22.23	43.82	45.00	44.41	20.27	20.21	20.27	19.44	20.98	19.84
38	24.41	41.05	42.37	41.71	17.15	17.09	17.15	17.23	17.96	16.76
39	24.49	41.17	42.76	41.97	16.68	16.57	16.68	16.78	17.47	16.31
40	24.28	43.07	44.09	43.58	15.48	15.21	15.48	15.51	16.84	15.31
41	24.15	42.93	43.64	43.29	16.13	15.92	16.13	16.11	16.70	15.94

Eyes					Super Formul a	PINK is > 0.5 D and PURPLE is > 1.0 D disparity from Super Formula				
#	Axial Length (mm)	K1 (D) ^a	K2 (D)	Avg K (D)		Hoffer Q	Hollad ay I	Koch Adj. ^b	Haigis	SRK/T
42	25.25	44.84	46.71	45.78	10.93	9.85	10.54	10.93	10.32	10.56
43	25.90	46.29	46.34	46.32	8.58	7.40	7.98	8.58	8.26	8.29
44	26.53	44.64	44.89	44.77	8.86	7.82	8.10	8.86	8.72	8.39
45	26.08	44.04	45.84	44.94	9.76	8.73	9.13	9.76	9.68	9.31
46	23.59	43.32	44.02	43.67	17.20	17.02	17.20	16.96	17.62	16.95
47	25.24	41.97	43.57	42.77	14.34	13.65	13.97	14.34	14.36	13.64
48	23.77	45.06	45.47	45.27	14.98	14.62	14.98	14.82	15.53	14.98
49	23.90	44.99	45.05	45.02	14.90	14.54	14.90	14.79	15.35	14.89
50	24.85	41.83	42.77	42.30	15.43	15.23	15.43	15.66	15.70	15.08
51	25.08	41.23	41.28	41.26	16.30	15.90	16.00	16.30	16.38	15.52
52	22.22	42.54	43.56	43.05	21.70	21.75	21.70	20.88	22.84	21.10
53	22.82	42.93	44.02	43.48	19.53	19.47	19.53	18.98	21.36	19.11
54	22.64	42.89	44.69	43.79	19.71	19.65	19.71	19.08	21.29	19.29
55	22.61	43.55	44.21	43.88	19.70	19.64	19.70	19.06	20.13	19.29
56	25.36	42.94	44.98	43.96	12.75	11.86	12.34	12.75	12.38	12.14
57	25.38	43.82	47.71	45.77	10.63	9.51	10.20	10.63	10.09	10.23
58	24.20	43.34	44.03	43.69	15.57	15.30	15.57	15.57	15.73	15.43
59	24.25	44.25	44.68	44.47	14.59	14.22	14.59	14.61	14.64	14.54
60	24.55	41.55	43.28	42.42	16.05	15.88	16.05	16.18	16.60	15.73
61	24.27	42.92	43.66	43.29	15.82	15.58	15.82	15.84	16.36	15.61
62	24.41	45.19	45.76	45.48	13.05	12.54	13.05	13.12	13.15	13.12
63	24.87	45.41	46.46	45.94	11.33	10.69	11.33	11.58	11.23	11.42
64	28.85	42.57	44.46	43.52	5.29	3.98	4.07	5.29	4.74	4.55
65	28.72	42.68	43.97	43.33	5.78	4.53	4.59	5.78	5.26	5.05
66	22.38	42.63	43.54	43.09	21.19	21.23	21.19	20.45	22.14	20.64
67	22.92	42.96	43.26	43.11	19.63	19.59	19.63	19.12	20.29	19.18
68	23.19	41.29	41.82	41.56	20.49	20.58	20.49	20.10	21.67	19.92
69	21.81	48.36	48.36	48.36	17.34	17.13	17.34	16.26	17.75	17.45
70	22.08	47.62	49.12	48.37	16.47	16.21	16.47	15.53	16.81	16.65
71	23.48	44.11	45.64	44.88	16.20	15.92	16.20	15.92	16.69	16.09
72	24.00	44.73	45.84	45.29	14.34	13.93	14.34	14.27	14.67	14.39
73	23.50	42.26	42.44	42.35	18.83	18.81	18.83	18.57	19.05	18.41
74	20.98	46.80	47.00	46.90	21.65	21.65	21.62	20.12	22.41	21.26
75	25.19	45.75	46.19	45.97	10.83	9.76	10.47	10.83	10.25	10.52
76	24.21	45.63	46.54	46.09	12.89	12.35	12.89	12.89	13.01	13.08
77	24.18	46.65	47.58	47.12	11.79	11.16	11.79	11.78	11.76	12.18
78	24.51	46.19	47.34	46.77	11.31	10.65	11.31	11.43	11.31	11.58
79	26.65	41.87	43.10	42.49	11.24	10.49	10.48	11.24	10.75	10.57
80	27.15	41.32	43.23	42.28	10.34	9.56	9.48	10.34	9.85	9.66
81	28.50	43.92	45.31	44.62	4.61	3.24	3.43	4.61	4.04	3.95
82	23.05	43.97	45.61	44.79	17.49	17.28	17.49	17.03	18.05	17.28
83	23.06	43.89	45.36	44.63	17.64	17.44	17.64	17.18	18.27	17.41
84	24.31	43.55	45.46	44.51	14.39	14.01	14.39	14.43	14.79	14.34
85	23.10	42.89	43.61	43.25	18.98	18.91	18.98	18.55	19.52	18.59

Eyes					Super Formul a	PINK is > 0.5 D and PURPLE is > 1.0 D disparity from Super Formula				
#	Axial Length (mm)	K1 (D) ^a	K2 (D)	Avg K (D)		Hoffer Q	Hollad ay I	Koch Adj. ^b	Haigis	SRK/T
86	22.99	43.72	43.78	43.75	18.76	18.66	18.76	18.28	19.18	18.41
87	24.15	44.13	45.49	44.81	14.47	14.08	14.47	14.45	14.64	14.47
88	22.43	44.56	45.29	44.93	19.13	19.01	19.13	18.40	19.92	18.82
89	22.11	44.09	45.67	44.88	20.14	20.06	20.14	19.25	21.35	19.75
90	25.44	42.01	43.69	42.85	13.78	13.03	13.35	13.78	13.68	13.06
91	25.53	41.74	43.28	42.51	13.92	13.23	13.47	13.92	13.82	13.19
92	28.06	39.11	40.12	39.62	11.44	10.93	10.42	11.44	11.84	10.56
93	27.39	44.34	45.59	44.97	6.59	5.41	5.63	6.59	6.41	6.09
94	22.76	44.02	45.50	44.76	18.35	18.19	18.35	17.76	19.31	18.08
95	22.94	43.95	46.05	45.00	17.58	17.37	17.58	17.07	18.28	17.38
96	24.85	41.71	43.63	42.67	15.03	14.78	15.03	15.26	15.22	14.71
97	24.41	41.54	43.80	42.67	16.13	15.95	16.13	16.20	16.41	15.84
98	23.76	44.57	45.57	45.07	15.23	14.88	15.23	15.06	16.22	15.19
99	23.69	45.01	45.65	45.33	15.13	14.77	15.13	14.93	15.59	15.12
100	25.29	42.89	43.10	43.00	13.98	13.24	13.61	13.98	13.73	13.29

* The IOL values calculated by the super formula are 100% accurately assigned to the ideal IOL formula using input parameters based on peer-reviewed literature. Color coding signifies the disparity between existing IOL formulas and the super formula (pink represents > 0.5 diopter and purple represents > 1.0 diopter disparity). These formulas used a target refraction of 0 diopter, and the manufacturer's A-constant of 115.3 (chosen to approximate values in Holladay et al¹). The corresponding values of surgeon factor and anterior chamber depth (ACD) were calculated from this A-constant value (supplied by the IOL manufacturer). This calculated value of ACD does not represent the true ACD, which is a clinically measured variable. However, for Haigis, the true measured value of ACD was used for each patient (not shown).

^a Keratometry reading in diopters (D)

^b Adjustment

^c The SRK/T formula is unable to calculate IOL power at certain values of corneal power and axial length. This has been referred to as the "null hypothesis" and is due to the occurrence of a negative square root in a part of the formula which results in imaginary numbers. We have used a known method of considering the negative square root as a 'zero' to bypass this issue and yield the given value for IOL power.

REFERENCES

1. Holladay JT, Prager TC, Chandler TY, Musgrove KH, Lewis JW, Ruiz RS. A three-part system for refining intraocular lens power calculations. *J Cataract Refract Surg.* 1988;14(1):17-24.