

# Universal Chart

## (all film formats & all lenses)

### for Exposure Compensation in f-stops

Pupillary Ratio (Diameter of lens exit pupil divided by diameter of lens entrance pupil)

		Telephoto					Symmetrical					Wide Angle											
		0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	
Magnification	.1	.83	.64	.53	.44	.39	.34	.30	.28	.25	.23	.21	.20	.19	.17	.16	.16	.15	.14	.13	.13	.12	
	.2	1.47	1.17	.97	.83	.73	.64	.58	.53	.48	.44	.41	.39	.36	.34	.32	.30	.29	.28	.26	.25	.24	
	.3	2.00	1.61	1.36	1.17	1.03	.92	.83	.76	.70	.64	.60	.56	.53	.50	.47	.44	.42	.40	.39	.37	.35	
	.4	2.44	2.00	1.70	1.47	1.30	1.17	1.06	.97	.89	.83	.77	.73	.68	.64	.61	.58	.55	.53	.50	.48	.46	
	.5	2.83	2.34	2.00	1.75	1.56	1.40	1.27	1.17	1.08	1.01	.94	.88	.83	.78	.74	.71	.67	.64	.62	.59	.57	
	.6	3.17	2.64	2.28	2.00	1.79	1.61	1.47	1.36	1.26	1.17	1.09	1.03	.97	.92	.87	.83	.79	.76	.73	.70	.67	
	.7	3.47	2.92	2.53	2.23	2.00	1.81	1.66	1.53	1.42	1.33	1.24	1.17	1.11	1.05	.99	.95	.91	.87	.83	.80	.77	
	.8	3.75	3.17	2.76	2.44	2.20	2.00	1.84	1.70	1.58	1.47	1.38	1.30	1.23	1.17	1.11	1.06	1.01	.97	.93	.89	.86	
	.9	4.00	3.4	2.97	2.64	2.39	2.17	2.00	1.85	1.72	1.61	1.52	1.43	1.36	1.29	1.23	1.17	1.12	1.07	1.03	.99	.95	
	Life Size →	1.0	4.23	3.61	3.17	2.83	2.56	2.34	2.16	2.00	1.87	1.75	1.65	1.56	1.47	1.4	1.33	1.27	1.22	1.17	1.12	1.08	1.04
		1.1	4.44	3.81	3.36	3.01	2.73	2.50	2.3	2.14	2.00	1.88	1.77	1.67	1.59	1.51	1.44	1.38	1.32	1.26	1.22	1.17	1.13
		1.2	4.64	4.00	3.53	3.17	2.88	2.64	2.44	2.28	2.13	2.00	1.89	1.79	1.70	1.61	1.54	1.47	1.41	1.36	1.30	1.26	1.21
		1.3	4.83	4.17	3.70	3.33	3.03	2.78	2.58	2.40	2.25	2.12	2.00	1.90	1.80	1.72	1.64	1.57	1.50	1.44	1.39	1.34	1.29
		1.4	5.01	4.34	3.85	3.47	3.17	2.92	2.71	2.53	2.37	2.23	2.11	2.00	1.90	1.81	1.73	1.66	1.59	1.53	1.47	1.42	1.37