RANK KALEE

EQUIPMENT FOR MOTION PICTURE AND TELEVISION PRODUCTION

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TAYLOR-HOBSON COOKE KINETAL LENSES FOR 16mm MOTION PICTURE PHOTOGRAPHY

Over the last few years the use of 16 mm. film for professional photography has increased, and of the several contributory factors, the introduction of high precision and lightweight 16 mm. motion picture cameras is very significant. The relative costs of filming in the 16 mm. gauge as opposed to the standard 35 mm. gauge are quite impressive, and a comparison of these may be made on the basis of footage per unit time; this ratio being of the order of 1: 2·5, a considerable saving in expenditure. In the Television Film Studios or in Newsreel Production, these factors suffice to dictate policy and it is surprising that the 16 mm. gauge has not presented an even greater challenge to the well accepted 35 mm. gauge.

The answer lies of course in the recorded image. The cumulative effects of inferior definition and grain in high speed emulsions become increasingly apparent on comparison shots between 16 mm. and 35 mm. on subsequent projection.

Recent advances by film stock manufacturers in 16 mm. emulsions, and the recognition by film laboratories of the stringent requirements of 16 mm. film processing, coupled with professional motion picture equipment and a range of lenses specifically designed with high corrections, relatively fast apertures, and providing uniform illumination over the whole of the 16 mm. picture format, will enable production units to utilize the advantages of 16 mm. film, while obtaining quality comparable with that usually associated with the larger format.

Recognising these trends, the Taylor-Hobson lens design team directed their efforts into the study of the ideal specification for a range of professional 16 mm. lenses.

FOCAL LENGTHS

A survey made of professional cameramen engaged in the 35 mm. and 16 mm. fields of motion picture photography indicated that the various angles for the 16 mm. should be similar to those employed in 35 mm. photography. The range of Kinetal lenses is shown in Figure 1.

Focal length	*F. No.*	*T. No.*	*Construction*
9 mm.	1·85	2	9(7)
12·5 mm.	1·8	2	9(7)
17·5 mm.	1·8	2	9(7)
25 mm.	1·8	2	6(4)
37·5 mm.	1·8	2	6(4)
50 mm.	1·8	2	6(4)
75 mm.	2·6	2·8	5(4)
100 mm.	2·6	2·8	5(4)
150 mm.	3·8	4	5(4)

Figure 1: The Range of Kinetal Lenses.

Equally important in the consideration of focal length was the choice of aperture and the ability to mount a number of lenses to multi-lens turrets with the minimum of lens to lens interference.

APERTURES

Our survey showed that the adoption of an aperture of the order of f/2 would meet current and foreseeable requirements, bearing in mind that the future would undoubtedly produce faster colour emulsions.

In view of the increased use of colour, it was decided to standardize upon T stops, and lenses in the wide to mid-angle range have been designed to provide a full aperture of T/2. The use of T stop calibration was introduced by Taylor-Hobson in 1948, and in the past ten years this has become an established practice with professional 35 mm. motion picture cameramen. It was therefore decided to calibrate the complete range of Kinetal Lenses with T stops only.

In explanation of the T stop or Transmission measurement form of aperture calibration, it will be appreciated that all lenses which bear the same traditional f/stop calibration may not necessarily transmit the same amount of light, and this variation between the lenses can result in an error of the order of half a stop, which has considerable significance in colour film stock exposure.

The variation in the types of lens construction, densities and thickness of glass, together with the slightly variable effects of the efficiency in lens coatings in respect to the different types of glass, all produce a rather indeterminate value of light transmission with respect to f/stop calibration between lenses.

When the f/stop method of calibration was formulated, these variations represented a small percentage of the total possible variations with respect to inconsistency in emulsion speeds and developer baths. The mechanical inaccuracies of iris control and aperture markings were added hazards in a sea of uncertainty. However, since that time unqualified developments have taken place, such that today empirical controls for correct exposure can now be replaced by precise controls, and T stop calibration has a very significant role. For full technical information in regard to the Taylor-Hobson methods of T/stop calibration, please refer to Motion Picture Leaflet LEN. 5.

National Standards and Draft Standards have called for tolerances of between $\pm 3\frac{1}{2}\%$ and $\pm$ 5% throughout the diaphragm for engraved T/stop markings, this representing a light factor or exposure variation of from $\pm 7\%$ to $\pm 10\%$. All Taylor-Hobson lenses are marked with an accuracy corresponding to the smaller tolerance.

While the new range of Kinetal lenses may vary in minimum aperture from f/1·8 to f/3·8 dependent on focal length (see Figure 1), they are all calibrated to have common transmission numbers following the accepted logarithmic progression. Thus consistent exposures are obtained on all lenses at the same T stop.

On pages 6 to 23 of this Leaflet are Depth of Field Tables, calculated for the T/stop calibration of the individual lenses. The tables have been calculated to account for the position of the front nodal point of each lens and all distances shown refer to measurement from the film plane.

UNIFORMITY OF ILLUMINATION

Also following from the use of colour stock, it is obvious that a new range of lenses must restrict vignetting to an absolute minimum in order to give uniformity of exposure over the whole frame.

In the past, the latitude in black and white stock has enabled the lens designer to take full advantage of the truism —"Where there is no light, there is no aberration", and obtain an adequate oblique ray correction at the expense of uniformity of exposure. The needs of the amateur were paramount, resulting in light-weight cameras of minimum bulk and small turret pitch, which placed severe restrictions on the lens designer. In many cases, therefore, due to the limited envelope of the lenses, mechanical vignetting was unavoidable.

In the design of the new range of Kinetal lenses, the Taylor-Hobson design staff have taken advantage of the relief from such restrictions which modern professional cameras afford and thereby have been able to achieve a new high degree of both optical and mechanical freedom from vignetting throughout the range. This admirable feature is best observed from the uniformity of exposure over the whole of the film plane, and more especially, with the use of colour film stock.

OPTICAL DESIGN

The stringent specifications, and the needs of the optical design dictate that use should be made of the latest advances in glass manufacture, taking the maximum benefit from the new rare earth glasses and recent advances in design technique. The glass components throughout are made to extremely close tolerances and all air to glass surfaces are efficiently fluoride coated to ensure maximum picture contrast and light transmission, as described in Motion Picture Leaflet LEN 3.

MECHANICAL DESIGN

As a result of close collaboration between optical and mechanical design staffs together with a wealth of experience gained in the solution of problems associated in the manufacture of high precision lens mounts it is possible to attain and maintain in manufacture a consistently high standard of optical performance by setting tolerances commensurate with optical design.

The optical components are mounted so as to ensure maximum rigidity whilst the dimensional tolerances of the metal components match closely those demanded in the manufacture of the lens elements.

Due note has also been taken of the need for minimum bulk and weight, and by the judicious use of aluminium a satisfactory compromise has been reached.

The external metal components are durably black enamelled on an efficient base anodising.

The KINETAL range of lenses will be available in the following versions:

Version	*Camera(s)*	*Please refer to supplementary Data Sheet*
Unmounted Optical Unit	For 16 mm. Motion Picture Cameras employing specialised lens mounts such as 16 mm. Mitchell, Acme, Camerette etc. The respective camera manufacturers supply suitable mounts.	200—1 to 9
In mounts for the 16 mm. Arriflex Camera	By arrangement with Arnold & Richter K.G., Munich, W. Germany, lenses are supplied in Taylor-Hobson designed mounts for this camera.	200—10 to 18
International Type C mounts	During 1959 Taylor-Hobson will supply lenses with mounts conforming to this standard for use with Auricon, Maurer, Bell & Howell, and Paillard-Bolex, etc.	200—20 to 28

9 mm. T/2·0 KINETAL LENS

This lens covers an extremely wide angular field of almost 70° (and has an approximate aperture of f/1·85), yielding a transmission aperture of T/2·0.

It represents the latest achievement in wide angle lens design, and because of current patent proceedings, it is not possible to disclose the construction. It is of the inverted telephoto type of construction, with seven components comprising nine elements. With a lens of such short focal length, Depth of Field considerations are not so critical and the wide relative aperture can be more useful than with any lens of longer focal length, particularly under conditions of severe space restrictions and low lighting levels.

12·5 mm. AND 17·5 mm. T/2·0 KINETAL LENSES

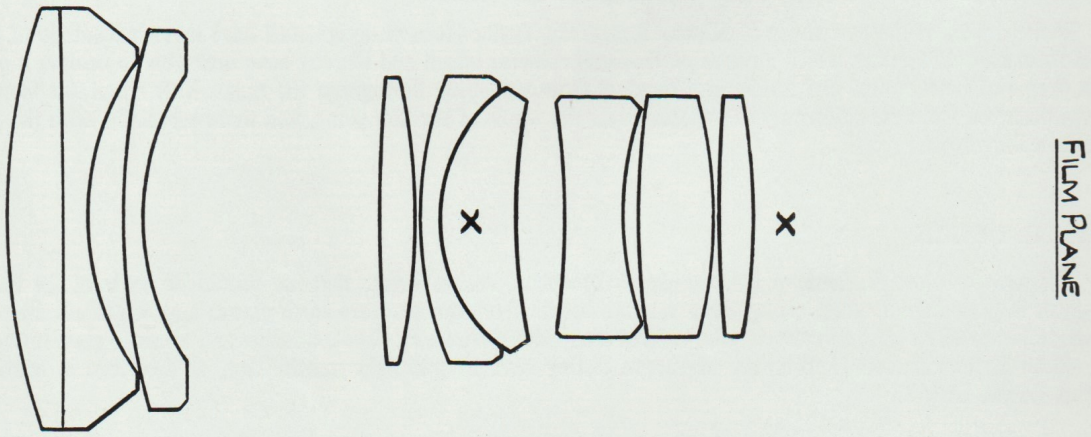

Figure 2

The 12·5 mm. and the 17·5 mm. lenses offer the professional film cameraman useful viewing angles in the short focus end of the range. Both lenses employ the now well established Taylor-Hobson inverted telephoto construction, of whose image quality 35 mm. professional cameramen are well aware from the use of the 18 mm. and 25 mm. Cooke Speed Panchro Series II lenses.

Each lens is individually corrected for its particular angular field and both represent a degree of quality hitherto unknown in wide angle 16 mm. photography.

The nine element, seven component construction (Fig. 2), is sufficiently complex to afford an almost complete correction of all the aberrations.

Both lenses are virtually free from vignetting, thus allowing uniform exposure across the whole of the 16 mm. picture area.

25 mm. 37·5 mm. AND 50 mm. T/2·0 KINETAL LENSES

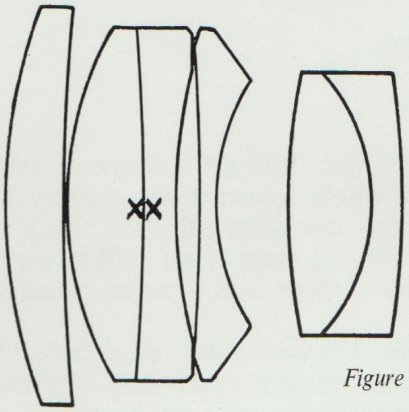

Figure 3

The 25 mm., 37·5 mm. and 50 mm. Kinetal lenses are of the six element, four component construction (Fig. 3), employing all the advantages of the new glass materials, together with improvements in design knowledge. All three lenses are corrected for their individual angular field, giving crispness of definition over the whole field. The absence of field curvature, together with encouraging vignetting characteristics, ensure that these lenses will uphold the standard demanded in the introduction of the new range of Kinetal lenses, where one of the major ideals was that all these lenses should provide a uniform exposure over the whole of the picture area.

75 mm., 100 mm. T/2·8 AND 150 mm. T/4·0 KINETAL LENSES

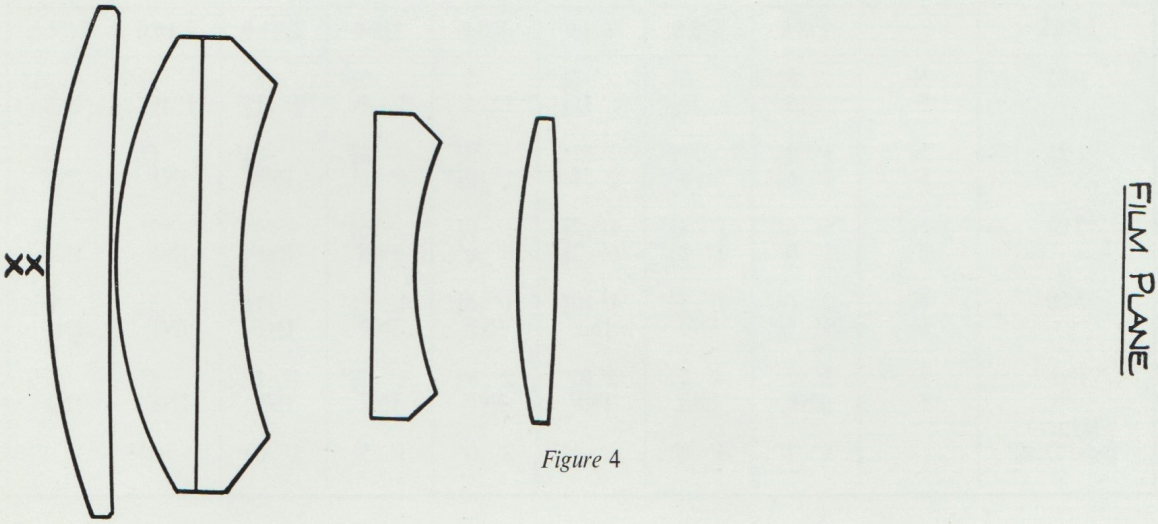

Figure 4

The scaling up of the traditional medium focus lens produces a lens of considerable bulk situated a long way from the focal plane of the camera and apart from causing obstruction to other lenses that may be mounted on the turret it also leads to a certain amount of instability. Yet to achieve the standard of performance now demanded in modern film production, it is necessary to have lenses more complex than the conventional Cooke triplet construction.

These problems had great significance in the design of the 75 mm., 100 mm. and 150 mm. Kinetal Lenses, and the illustration in Figure 4 shows how the problems have been solved.

These lenses exhibit a partial telephoto effect as will be seen from the forward position of the nodal points (see Fig. 4), thus reducing bulk and length, while departing from the usual true telephoto type of construction and providing a fast aperture and an excellent correction of all the aberrations normally associated with telephoto lenses. The novel features of this type of construction form the basis of the subject matter in the Taylor-Hobson Patent No. 659878, British and other foreign patents.

The five element, four component construction is designed to an aperture of T/2·8 or T/4·0 in the case of the 150 mm. lens, and these apertures, it is felt, are sufficient for long focus photography and thus bulk may be kept to a minimum.

Depth of Field Tables - in FEET with Relation to T/Stops

9mm. COOKE KINETAL LENS - (1·85) T/2·0

FOCUSING SCALE

Because of the very short focal length of the 9 mm. lens, the amount of axial movement for focusing from infinity to 9 in. is only 0·015 in. It will be appreciated that a very fine pitch focusing thread must be used even when the focusing scale represents only 120° rotation of the focusing ring. Clearly then, an inaccuracy of setting the focusing scale of, say, 0·05 in. peripheral movement will represent a back focus error of only 0·0005 in., which is an accepted manufacturing tolerance throughout the motion picture industry.

Taking full advantage of the depth of field offered by such a short focus lens, it has been decided to simplify the focusing scale and thereby avoid the confusion which might arise from a conventional and somewhat cramped focusing scale in the circumstances explained above. The new scale has six calibrated distances including infinity and the hyperfocal distance at full aperture (indicated by a blut dot). The hyperfocal distance has this quality: when a lens is set at the hyperfocal distance, its depth of field includes objects from infinity down to half the hyperfocal distance.

The following depth of field tables refer specifically to this particular optical design of 9 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
FEET		T/2·0	T/2·8	T/4·0	T/5·6	T/8·0	T/11·0	T/16·0	T/22·0
0·75	N	8¼″	8″	7½″	7″	6½″	6″	5¼″	4½″
	F	10″	10½″	11½″	1′ 1″	1′ 4″	1′ 11½″	9′ 10″	INF
1·25	N	1′ 0½″	11¾″	11″	9¾″	8¾″	7½″	6¼″	5¼″
	F	1′ 6¾″	1′ 8¾″	2′ 1″	2′ 10½″	6′ 11″	INF	INF	INF
2·00	N	1′ 6″	1′ 4½″	1′ 2½″	1′ 0¼″	10¾″	9″	7″	5¾″
	F	3′ 0″	3′ 0¼″	6′ 2½″	50′ 0″	INF	INF	INF	INF
5·00	N	2′ 8½″	2′ 3½″	1′ 10½″	1′ 6¼″	1′ 2¼″	11¼″	8½″	6¾″
	F	39′ 5¼″	INF	INF	INF	INF	INF	INF	INF
INF	N	5′ 7″	4′ 0″	2′ 10″	2′ 0½″	1′ 5½″	1′ 1″	9″	7″
	F	INF	INF	INF	INF	INF	INF	INF	INF
Hyper-focal Dist.		5′ 7″	4′ 0″	2′ 9¾″	2′ 0″	1′ 5″	1′ 0½″	8½″	6½″

Diameter of Disc of Confusion = 0·0005 inch.
Object distances from film plane.
U = object distance sharply focused, measured in feet.
N = nearest distance in focus, measured in inches.
F = farthest distance in focus, measured in inches.

Depth of Field Tables - in METRES with Relation to T/Stops

9 mm. COOKE KINETAL LENS - (1·85) T/2·0

The following depth of field table refers specifically to this particular optical design of 9 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
METRES		T/2·0	T/2·8	T/4·0	T/5·6	T/8·0	T/11·0	T/16·0	T/22·0
0·25	N	0·23	0·22	0·21	0·19	0·18	0·16	0·14	0·12
	F	0·29	0·31	0·34	0·39	0·51	0·87	INF	INF
0·50	N	0·39	0·36	0·32	0·28	0·24	0·21	0·17	0·14
	F	0·68	0·80	1·11	2·32	INF	INF	INF	INF
0·75	N	0·44	0·40	0·36	0·31	0·27	0·22	0·18	0·15
	F	0·84	1·04	1·63	7·17	INF	INF	INF	INF
1·50	N	0·65	0·57	0·48	0·40	0·32	0·26	0·20	0·16
	F	2·59	6·86	INF	INF	INF	INF	INF	INF
INF	N	1·67	1·20	0·84	0·61	0·43	0·32	0·23	0·17
	F	INF	INF	INF	INF	INF	INF	INF	INF
Hyper-focal Dist.		1·70	1·22	0·86	0·61	0·43	0·32	0·22	0·16

Diameter of Disc of Confusion = 0·013 mm.
Object distances from film plane.
U = object distance sharply focused, measured in metres.
N = nearest distance in focus, measured in metres.
F = farthest distance in focus, measured in metres.

Depth of Field Tables - in FEET with Relation to T/Stops

12·5 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 12·5 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
FEET		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
1·00	N	0′ 11¼″	0′ 11″	0′ 10¾″	0′ 10½″	0′ 9¾″	0′ 9¼″	0′ 8½″	0′ 7¾″
	F	1′ 0¾″	1′ 1″	1′ 1½″	1′ 2½″	1′ 3¾″	1′ 6″	1′ 11¾″	3′ 4¼″
1·25	N	1′ 2″	1′ 1½″	1′ 1″	1′ 0½″	0′ 11½″	0′ 10¾″	0′ 9¾″	0′ 8¾″
	F	1′ 4¼″	1′ 5″	1′ 5¾″	1′ 7¼″	1′ 10¼″	2′ 3½″	3′ 10½″	29′ 6¼″
1·50	N	1′ 4½″	1′ 3¾″	1′ 3″	1′ 2¼″	1′ 1″	1′ 0″	0′ 10½″	0′ 9¼″
	F	1′ 8″	1′ 9″	1′ 10½″	2′ 1¼″	2′ 6¾″	3′ 6½″	10′ 6½″	INF
1·75	N	1′ 6¾″	1′ 6″	1′ 5″	1′ 4″	1′ 2½″	1′ 1″	0′ 11¼″	0′ 10″
	F	2′ 0″	2′ 1¼″	2′ 3¾″	2′ 8″	3′ 6″	5′ 9¼″	INF	INF
2·00	N	1′ 9″	1′ 8″	1′ 6¾″	1′ 5½″	1′ 3¾″	1′ 2″	1′ 0″	0′ 10½″
	F	2′ 4″	2′ 6″	2′ 9¾″	3′ 4½″	4′ 10″	11′ 0¾″	INF	INF
2·25	N	1′ 11¼″	1′ 10″	1′ 8½″	1′ 6¾″	1′ 4¾″	1′ 2¾″	1′ 0½″	0′ 10¾″
	F	2′ 8¼″	2′ 11″	3′ 4¼″	4′ 2½″	6′ 11″	38′ 4″	INF	INF
2·50	N	2′ 1½″	2′ 0″	1′ 10¼″	1′ 8¼″	1′ 5¾″	1′ 3½″	1′ 1″	0′ 11″
	F	3′ 0¾″	3′ 4½″	3′ 11¾″	5′ 3½″	10′ 6″	INF	INF	INF
3·00	N	2′ 5½″	2′ 3½″	2′ 1″	1′ 10½″	1′ 7½″	1′ 5″	1′ 2″	0′ 11¾″
	F	3′ 10½″	4′ 5″	5′ 6½″	8′ 6¼″	47′ 8″	INF	INF	INF
4·00	N	3′ 0¾″	2′ 9¾″	2′ 6″	2′ 2¼″	1′ 10¼″	1′ 6¾″	1′ 3″	1′ 0½″
	F	5′ 9¾″	7′ 1½″	10′ 10″	36′ 6″	INF	INF	INF	INF
6·00	N	4′ 1″	3′ 7½″	3′ 1½″	2′ 7¾″	2′ 1¾″	1′ 9¼″	1′ 4½″	1′ 1¼″
	F	11′ 7″	18′ 7½″	236′ 0″	INF	INF	INF	INF	INF
8·00	N	4′ 10¾″	4′ 3″	3′ 6¾″	2′ 11¼″	2′ 4″	1′ 10¾″	1′ 5¼″	1′ 1¾″
	F	23′ 0¼″	96′ 7″	INF	INF	INF	INF	INF	INF
15·00	N	6′ 9¼″	5′ 7″	4′ 5¼″	3′ 6″	2′ 8″	2′ 1″	1′ 6¾″	1′ 2½″
	F	INF	INF	INF	INF	INF	INF	INF	INF
INF	N	12′ 1″	8′ 8¼″	6′ 1¾″	4′ 5½″	3′ 2¼″	2′ 4½″	1′ 8¼″	1′ 3½″
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·0005 inch.
Object distances measured from film plane.
U = object distance sharply focused, measured in feet.
N = nearest distance in focus, measured in feet and inches.
F = farthest distance in focus, measured in feet and inches.

Depth of Field Tables - in METRES with Relation to T/Stops

12·5 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 12·5 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
METRES		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
0·30	N	0·28	0·28	0·27	0·26	0·25	0·23	0·21	0·20
	F	0·32	0·33	0·34	0·36	0·39	0·45	0·58	0·96
0·40	N	0·37	0·36	0·34	0·33	0·30	0·28	0·25	0·22
	F	0·45	0·45	0·48	0·53	0·61	0·78	1·44	INF
0·50	N	0·45	0·43	0·41	0·39	0·35	0·32	0·28	0·25
	F	0·56	0·59	0·65	0·73	0·93	1·40	12·45	INF
0·60	N	0·53	0·50	0·47	0·44	0·40	0·35	0·30	0·26
	F	0·70	0·75	0·84	1·00	1·42	3·06	INF	INF
0·70	N	0·60	0·57	0·53	0·49	0·43	0·38	0·32	0·28
	F	0·84	0·92	1·06	1·34	2·26	19·50	INF	INF
0·80	N	0·67	0·63	0·58	0·53	0·46	0·41	0·34	0·29
	F	0·99	1·10	1·32	1·81	4·11	INF	INF	INF
1·00	N	0·80	0·75	0·68	0·60	0·52	0·44	0·36	0·30
	F	1·34	1·55	2·03	3·52	INF	INF	INF	INF
1·25	N	0·95	0·87	0·77	0·68	0·57	0·48	0·39	0·32
	F	1·84	2·28	3·55	14·70	INF	INF	INF	INF
1·50	N	1·09	0·98	0·86	0·74	0·61	0·51	0·40	0·33
	F	2·46	3·33	7·11	INF	INF	INF	INF	INF
2·00	N	1·32	1·17	0·99	0·83	0·68	0·55	0·43	0·34
	F	4·26	7·85	INF	INF	INF	INF	INF	INF
3·00	N	1·68	1·43	1·18	0·96	0·75	0·60	0·45	0·36
	F	15·72	INF	INF	INF	INF	INF	INF	INF
6·00	N	2·30	1·86	1·45	1·12	0·85	0·65	0·48	0·37
	F	INF	INF	INF	INF	INF	INF	INF	INF
INF	N	3·68	2·65	1·87	1·36	0·97	0·72	0·52	0·39
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·013 mm.
Object distances measured from film plane.
U = object distance sharply focused, measured in metres.
N = nearest distance in focus, measured in metres.
F = farthest distance in focus, measured in metres.

Depth of Field Tables - in FEET with Relation to T/Stops

17·5 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 17·5 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
FEET		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
1·00	N	0′ 11½″	0′ 11½″	0′ 11¼″	0′ 11″	0′ 10½″	0′ 10″	0′ 9½″	0′ 8¾″
	F	1′ 0½″	1′ 0¾″	1′ 1″	1′ 1¼″	1′ 2″	1′ 3″	1′ 5″	1′ 8″
1·25	N	1′ 2¼″	1′ 2″	1′ 1¾″	1′ 1½″	1′ 0¾″	1′ 0″	0′ 11″	0′ 10¼″
	F	1′ 3¾″	1′ 4″	1′ 4½″	1′ 5¼″	1′ 6½″	1′ 8¼″	2′ 0¼″	2′ 8″
1·50	N	1′ 5″	1′ 4¾″	1′ 4¼″	1′ 3½″	1′ 2¾″	1′ 1¾″	1′ 0½″	0′ 11¼″
	F	1′ 7″	1′ 7½″	1′ 8½″	1′ 9½″	1′ 11½″	2′ 2¾″	2′ 10½″	4′ 5½″
2·00	N	1′ 10¼″	1′ 9½″	1′ 8¾″	1′ 7½″	1′ 6¼″	1′ 4¾″	1′ 2¾″	1′ 1¼″
	F	2′ 2¼″	2′ 3″	2′ 4¾″	2′ 7¼″	2′ 11¾″	3′ 8¼″	6′ 0¾″	27′ 3″
2·50	N	2′ 3¼″	2′ 2¼″	2′ 0¾″	1′ 11¼″	1′ 9¼″	1′ 7¼″	1′ 4¾″	1′ 2¼″
	F	2′ 9½″	2′ 11¼″	3′ 2″	3′ 6½″	4′ 4″	6′ 0½″	17′ 7½″	INF
3·00	N	2′ 8″	2′ 6½″	2′ 4¾″	2′ 2¾″	1′ 9½″	1′ 9½″	1′ 6¼″	1′ 3¾″
	F	3′ 5¼″	3′ 8″	4′ 0½″	4′ 8½″	6′ 2¾″	10′ 6½″	INF	INF
4·00	N	3′ 5″	3′ 2¾″	2′ 11¾″	2′ 8½″	2′ 4¾″	2′ 1″	1′ 8¾″	1′ 5½″
	F	4′ 10¼″	5′ 3½″	6′ 2″	7′ 10½″	13′ 7¼″	160′ 1¼″	INF	INF
6·00	N	4′ 9″	4′ 4½″	3′ 11¼″	3′ 5½″	2′ 11½″	2′ 6″	2′ 0″	1′ 7½″
	F	8′ 2¼″	9′ 7¼″	12′ 11¾″	24′ 5½″	INF	INF	INF	INF
8·00	N	5′ 10¾″	5′ 4″	4′ 8¼″	4′ 0¼″	3′ 4″	2′ 9¼″	2′ 2″	1′ 8¾″
	F	12′ 6¼″	16′ 2½″	29′ 0½″	INF	INF	INF	INF	INF
12·00	N	7′ 9½″	6′ 10″	5′ 9½″	4′ 9¾″	3′ 10¼″	3′ 1¼″	2′ 4¼″	1′ 10¼″
	F	26′ 6¼″	51′ 7″	INF	INF	INF	INF	INF	INF
20·00	N	10′ 5¾″	8′ 9¾″	7′ 1½″	5′ 8½″	4′ 4¾″	3′ 5¼″	2′ 6½″	1′ 11½″
	F	250′ 3¼″	INF	INF	INF	INF	INF	INF	INF
INF	N	21′ 8½″	15′ 6¾″	10′ 11½″	7′ 10½″	5′ 6¾″	4′ 1½″	2′ 10½″	2′ 1¾″
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·0005 inch.
Object distances measured from film plane.
U = object distance sharply focused, measured in feet.
N = nearest distance in focus, measured in feet and inches.
F = farthest distance in focus, measured in feet and inches.

Depth of Field Tables - in METRES with Relation to T/Stops

17·5 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 17·5 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
METRES		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
0·30	N	0·29	0·29	0·28	0·27	0·26	0·25	0·24	0·22
	F	0·31	0·32	0·32	0·33	0·35	0·37	0·42	0·49
0·40	N	0·38	0·37	0·36	0·35	0·34	0·32	0·29	0·27
	F	0·42	0·43	0·43	0·47	0·50	0·55	0·68	0·92
0·50	N	0·47	0·46	0·44	0·42	0·40	0·37	0·34	0·30
	F	0·54	0·55	0·58	0·61	0·68	0·79	1·07	1·90
0·60	N	0·56	0·54	0·52	0·49	0·46	0·42	0·37	0·33
	F	0·65	0·68	0·72	0·78	0·89	1·09	1·75	6·67
0·75	N	0·68	0·66	0·62	0·59	0·54	0·49	0·42	0·37
	F	0·84	0·88	0·95	1·06	1·29	1·77	4·79	INF
1·00	N	0·88	0·84	0·78	0·72	0·65	0·57	0·49	0·41
	F	1·17	1·25	1·40	1·66	2·33	4·73	INF	INF
1·25	N	1·06	1·00	0·92	0·84	0·74	0·64	0·53	0·45
	F	1·52	1·67	1·95	2·53	4·55	INF	INF	INF
2·00	N	1·55	1·42	1·27	1·11	0·94	0·79	0·62	0·50
	F	2·83	3·40	4·88	11·65	INF	INF	INF	INF
3·00	N	2·08	1·86	1·60	1·35	1·10	0·90	0·69	0·55
	F	5·43	0·03	29·04	INF	INF	INF	INF	INF
4·00	N	2·51	2·19	1·84	1·52	1·21	0·97	0·73	0·57
	F	10·00	25·12	INF	INF	INF	INF	INF	INF
6·00	N	3·17	2·67	2·16	1·73	1·34	1·04	0·77	0·59
	F	63·44	INF	INF	INF	INF	INF	INF	INF
INF	N	6·62	4·73	3·34	2·40	1·70	1·25	0·88	0·65
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·013 mm.
Object distances measured from film plane.
U = object distance sharply focused, measured in metres.
N = nearest distance in focus, measured in metres.
F = farthest distance in focus, measured in metres.

Depth of Field Tables - in FEET with Relation to T/Stops

25 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 25 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
FEET		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
1·00	N	0′ 11¾″	0′ 11¾″	0′ 11½″	0′ 11½″	0′ 11¼″	0′ 11″	0′ 10½″	0′ 10″
	F	1′ 0¼″	1′ 0¼″	1′ 0½″	1′ 0¾″	1′ 1″	1′ 1¼″	1′ 2″	1′ 3″
1·25	N	1′ 2¾″	1′ 2½″	1′ 2¼″	1′ 2″	1′ 1¾″	1′ 1¼″	1′ 0¾″	1′ 0″
	F	1′ 3¼″	1′ 3½″	1′ 3¾″	1′ 4″	1′ 4½″	1′ 5¼″	1′ 6½″	1′ 8¼″
1·50	N	1′ 5½″	1′ 5¼″	1′ 5″	1′ 4¾″	1′ 4″	1′ 3½″	1′ 2¾″	1′ 1¾″
	F	1′ 6½″	1′ 6¾″	1′ 7¼″	1′ 7½″	1′ 8½″	1′ 9½″	1′ 11½″	2′ 2¾″
1·75	N	1′ 8¼″	1′ 8″	1′ 7¾″	1′ 7¼″	1′ 6½″	1′ 5¾″	1′ 4½″	1′ 3¼″
	F	1′ 9¾″	1′ 10″	1′ 10½″	1′ 11¼″	2′ 0½″	2′ 2″	2′ 5¼″	2′ 10¼″
2·00	N	1′ 11″	1′ 10¾″	1′ 10¼″	1′ 9½″	1′ 8¾″	1′ 7¾″	1′ 6¼″	1′ 4¾″
	F	2′ 1″	2′ 1½″	2′ 2¼″	2′ 3″	2′ 4¾″	2′ 7″	2′ 11½″	3′ 7½″
2·50	N	2′ 4½″	2′ 4″	2′ 3¼″	2′ 2¼″	2′ 1″	1′ 11½″	1′ 9½″	1′ 7¼″
	F	2′ 7¾″	2′ 8¼″	2′ 9½″	2′ 11″	3′ 1¾″	3′ 6″	4′ 3¼″	5′ 10″
3·00	N	2′ 9¾″	2′ 9″	2′ 8″	2′ 6¾″	2′ 4¾″	2′ 2¾″	2′ 0¼″	1′ 9½″
	F	3′ 2½″	3′ 3½″	3′ 5¼″	3′ 7¾″	4′ 0¼″	4′ 7¼″	6′ 0¾″	9′ 9¾″
4·00	N	3′ 8¼″	3′ 7″	3′ 5″	3′ 2¾″	3′ 0″	2′ 8¾″	2′ 4¾″	2′ 1¼″
	F	4′ 4½″	4′ 6½″	4′ 10″	5′ 3″	6′ 1″	7′ 6½″	12′ 7¾″	66′ 9¾″
6·00	N	5′ 3¾″	5′ 1″	4′ 9¼″	4′ 5″	3′ 11½″	3′ 6¼″	2′ 11¾″	2′ 6¼″
	F	6′ 10¾″	7′ 4″	8′ 1¼″	9′ 5¼″	12′ 6¼″	21′ 1¼″	INF	INF
10·00	N	8′ 2½″	7′ 8″	6′ 11½″	6′ 2¾″	5′ 4¼″	4′ 7″	3′ 8½″	3′ 0¼″
	F	12′ 9¾″	14′ 5¼″	17′ 9¾″	25′ 11¼″	81′ 8¾″	INF	INF	INF
20·00	N	13′ 10½″	12′ 4½″	10′ 7¾″	8′ 11¾″	7′ 3½″	5′ 11″	4′ 6″	3′ 6¼″
	F	35′ 10½″	52′ 7″	174′ 3¾″	INF	INF	INF	INF	INF
INF	N	44′ 11¾″	32′ 2″	22′ 6¾″	16′ 2″	11′ 4½″	8′ 3¾″	5′ 9¼″	4′ 3″
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·0005 inch.
Object distances measured from film plane.
U = object distance sharply focused, measured in feet.
N = nearest distance in focus, measured in feet and inches.
F = farthest distance in focus, measured in feet and inches.

Depth of Field Tables - in METRES with Relation to T/Stops

25 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 25 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
METRES		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
0·30	N	0·30	0·29	0·29	0·29	0·28	0·27	0·26	0·25
	F	0·31	0·31	0·31	0·32	0·32	0·33	0·35	0·37
0·40	N	0·39	0·39	0·38	0·37	0·36	0·35	0·33	0·32
	F	0·41	0·41	0·42	0·43	0·45	0·46	0·50	0·55
0·50	N	0·48	0·48	0·47	0·46	0·44	0·43	0·40	0·37
	F	0·52	0·52	0·54	0·55	0·58	0·61	0·68	0·78
0·60	N	0·58	0·57	0·56	0·54	0·52	0·49	0·46	0·42
	F	0·63	0·64	0·65	0·68	0·71	0·77	0·88	1·07
0·70	N	0·67	0·66	0·64	0·62	0·59	0·56	0·51	0·47
	F	0·73	0·75	0·77	0·81	0·86	0·95	1·13	1·46
0·80	N	0·76	0·74	0·72	0·69	0·66	0·62	0·56	0·51
	F	0·85	0·87	0·90	0·94	1·02	1·14	1·42	2·01
1·00	N	0·94	0·91	0·88	0·84	0·79	0·73	0·65	0·58
	F	1·08	1·11	1·16	1·24	1·38	1·62	2·25	4·23
1·25	N	1·15	1·11	1·07	1·01	0·93	0·85	0·74	0·65
	F	1·37	1·43	1·52	1·66	1·93	2·42	4·19	35·68
2·00	N	1·75	1·67	1·56	1·43	1·28	1·13	0·95	0·80
	F	2·33	2·50	2·80	3·33	4·66	9·29	INF	INF
3·00	N	2·47	2·31	2·10	1·88	1·62	1·39	1·12	0·91
	F	3·83	4·30	5·28	7·59	21·99	INF	INF	INF
6·00	N	4·18	3·74	3·22	2·72	2·21	1·79	1·37	1·07
	F	10·63	15·38	46·58	INF	INF	INF	INF	INF
INF	N	13·71	9·81	6·88	4·93	3·47	2·53	1·76	1·29
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·013 mm.
Object distances from film plane.
U = object distance sharply focused, measured in metres.
N = nearest distance in focus, measured in metres.
F = farthest distance in focus, measured in metres.

Depth of Field Tables - in FEET with Relation to T/Stops

37·5 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 37·5 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
FEET		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
1·75	N	1′ 8¾″	1′ 8½″	1′ 8½″	1′ 8¼″	1′ 7¾″	1′ 7½″	1′ 6¾″	1′ 6″
	F	1′ 9¼″	1′ 9½″	1′ 9¾″	1′ 10″	1′ 10¼″	1′ 11″	1′ 11¾″	2′ 1¼″
2·00	N	1′ 11½″	1′ 11½″	1′ 11¼″	1′ 11″	1′ 10½″	1′ 10″	1′ 9″	1′ 8¼″
	F	2′ 0½″	2′ 0¼″	2′ 0¾″	2′ 1¼″	2′ 1¾″	2′ 2½″	2′ 4″	2′ 5¾″
2·50	N	2′ 5¼″	2′ 5″	2′ 4¾″	2′ 4¼″	2′ 3½″	2′ 2¾″	2′ 1½″	2′ 0¼″
	F	2′ 6¾″	2′ 7″	2′ 7½″	2′ 8″	2′ 9″	2′ 10¼″	3′ 0¾″	3′ 4″
3·00	N	2′ 11″	2′ 10¾″	2′ 10″	2′ 9½″	2′ 8½″	2′ 7¼″	2′ 5½″	2′ 3¾″
	F	3′ 1″	3′ 1½″	3′ 2″	3′ 3″	3′ 4½″	3′ 6½″	3′ 10¼″	4′ 4″
4·00	N	3′ 10¼″	3′ 9½″	3′ 8¾″	3′ 7½″	3′ 5¾″	3′ 3¾″	3′ 1″	2′ 10¼″
	F	4′ 2″	4′ 2¾″	4′ 4″	4′ 5¾″	4′ 8½″	5′ 0½″	5′ 8¾″	6′ 10¼″
5·00	N	4′ 9¼″	4′ 8¼″	4′ 6¾″	4′ 5″	4′ 2½″	3′ 11½″	3′ 7½″	3′ 3¾″
	F	5′ 3″	5′ 4¼″	5′ 6¼″	5′ 9¼″	6′ 2¼″	6′ 9½″	8′ 1¼″	10′ 7″
6·00	N	5′ 8″	5′ 6½″	5′ 4½″	5′ 2″	4′ 10½″	4′ 6¾″	4′ 1½″	3′ 8½″
	F	6′ 4½″	6′ 6¼″	6′ 9½″	7′ 2″	7′ 9¾″	8′ 9¾″	11′ 2½″	16′ 7¼″
8·00	N	7′ 5″	7′ 2½″	6′ 11″	6′ 6¾″	6′ 1¼″	5′ 7½″	4′ 11½″	4′ 4¼″
	F	8′ 8¼″	8′ 11¾″	9′ 5¾″	10′ 3″	11′ 7¾″	14′ 0½″	21′ 4¾″	57′ 7″
10·00	N	9′ 1¼″	8′ 9½″	8′ 4¼″	7′ 10¼″	7′ 2¼″	6′ 6¼″	5′ 7¾″	4′ 10½″
	F	11′ 1″	11′ 7¼″	12′ 5½″	13′ 9¾″	16′ 6″	21′ 9¾″	47′ 1¾″	INF
15·00	N	13′ 0¾″	12′ 5″	11′ 6¾″	10′ 7¼″	9′ 5¼″	8′ 3½″	6′ 11″	5′ 9¼″
	F	17′ 7½″	18′ 11½″	21′ 4½″	25′ 8¾″	37′ 1½″	83′ 1¼″	INF	INF
30·00	N	23′ 1″	21′ 1¾″	18′ 9¼″	16′ 4¼″	13′ 8½″	11′ 4¾″	8′ 11¼″	7′ 1¼″
	F	42′ 10¾″	51′ 9½″	75′ 2¼″	189′ 3″	INF	INF	INF	INF
INF	N	99′ 3″	70′ 11½″	49′ 9″	35′ 7¼″	25′ 0″	18′ 3″	12′ 7½″	9′ 3″
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·0005 inch.
Object distances measured from film plane.
U = object distance sharply focused, measured in feet.
N = nearest distance in focus, measured in feet and inches.
F = farthest distance in focus, measured in feet and inches.

Depth of Field Tables - in METRES with Relation to T/Stops

37·5 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 37·5 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
METRES		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
0·50	N	0·49	0·49	0·49	0·48	0·47	0·46	0·45	0·44
	F	0·51	0·51	0·51	0·52	0·53	0·54	0·56	0·59
0·60	N	0·59	0·59	0·58	0·57	0·56	0·55	0·53	0·51
	F	0·61	0·61	0·62	0·63	0·64	0·66	0·70	0·74
0·70	N	0·69	0·68	0·67	0·66	0·65	0·63	0·60	0·57
	F	0·71	0·72	0·73	0·74	0·76	0·79	0·84	0·91
0·80	N	0·78	0·77	0·76	0·75	0·73	0·71	0·67	0·64
	F	0·82	0·83	0·84	0·86	0·88	0·92	0·99	1·09
1·00	N	0·97	0·96	0·94	0·92	0·89	0·86	0·81	0·75
	F	1·03	1·05	1·07	1·09	1·14	1·20	1·32	1·51
1·20	N	1·16	1·14	1·12	1·09	1·05	1·00	0·93	0·86
	F	1·25	1·27	1·30	1·34	1·41	1·51	1·71	2·03
1·50	N	1·43	1·41	1·37	1·33	1·26	1·19	1·10	1·00
	F	1·57	1·61	1·66	1·73	1·85	2·03	2·41	3·12
2·00	N	1·88	1·84	1·78	1·70	1·60	1·49	1·33	1·19
	F	2·14	2·20	2·29	2·43	2·68	3·08	4·08	6·69
3·00	N	2·74	2·64	2·52	2·36	2·17	1·97	1·71	1·47
	F	3·32	3·47	3·72	4·12	4·90	6·42	13·34	INF
5·00	N	4·30	4·07	3·77	3·44	3·04	2·65	2·19	1·82
	F	5·98	6·48	7·42	9·21	14·40	48·79	INF	INF
10·00	N	7·53	6·86	6·04	5·22	4·34	3·59	2·79	2·21
	F	14·90	18·53	29·22	126·50	INF	INF	INF	INF
INF	N	30·25	21·63	15·16	10·85	7·62	5·56	3·85	2·82
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·013 mm.
Object distances measured from film plane.
U = object distance sharply focused, measured in metres.
N = nearest distance in focus, measured in metres.
F = farthest distance in focus, measured in metres.

Depth of Field Tables - in FEET with Relation to T/Stops

50 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 50 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
FEET		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
3·00	N	2′ 11½″	2′ 11¼″	2′ 11″	2′ 10½″	2′ 10″	2′ 9¼″	2′ 8¼″	2′ 7″
	F	3′ 0½″	3′ 0¾″	3′ 1″	3′ 1½″	3′ 2¼″	3′ 3¼″	3′ 4¾″	3′ 7″
3·50	N	3′ 5¼″	3′ 5″	3′ 4½″	3′ 4″	3′ 3¼″	3′ 2¼″	3′ 1″	2′ 11¼″
	F	3′ 6¾″	3′ 7¼″	3′ 7½″	3′ 8¼″	3′ 9¼″	3′ 10½″	4′ 1″	4′ 4″
4·00	N	3′ 11″	3′ 10¾″	3′ 10¼″	3′ 9½″	3′ 8½″	3′ 7¼″	3′ 5¼″	3′ 3¼″
	F	4′ 1″	4′ 1½″	4′ 2″	4′ 3″	4′ 4¼″	4′ 6″	4′ 9¼″	5′ 2″
4·50	N	4′ 4¾″	4′ 4¼″	4′ 3½″	4′ 2¾″	4′ 1½″	4′ 0″	3′ 9¾″	3′ 7¼″
	F	4′ 7¼″	4′ 7¾″	4′ 8¾″	4′ 9¾″	4′ 11½″	5′ 2″	5′ 6¼″	6′ 0½″
5·00	N	4′ 10½″	4′ 10″	4′ 9″	4′ 8″	4′ 6½″	4′ 4½″	4′ 1¾″	3′ 10¾″
	F	5′ 1½″	5′ 2¼″	5′ 3¼″	5′ 4¾″	5′ 7″	5′ 10″	6′ 3¾″	7′ 0″
6·00	N	5′ 9¾″	5′ 9″	5′ 7¾″	5′ 6¼″	5′ 4″	5′ 1½″	4′ 9¾″	4′ 5¾″
	F	6′ 2¼″	6′ 3¼″	6′ 4¾″	6′ 7″	6′ 10½″	7′ 3″	8′ 0¼″	9′ 2¼″
8·00	N	7′ 8″	7′ 6½″	7′ 4½″	7′ 1¾″	6 6″	6 6″	5′ 11¾″	5′ 5¾″
	F	8′ 4¼″	8′ 6″	8′ 9″	9′ 1″	9′ 7¾″	10′ 5½″	12′ 1¾″	15′ 1″
10·00	N	9′ 6″	9′ 3½″	9′ 0¼″	8′ 8¼″	8′ 2¾″	7′ 8¾″	7′ 0¼″	6′ 4″
	F	10′ 6¾″	10′ 9¾″	11′ 2½″	11′ 9¼″	12′ 9″	14′ 2½″	17′ 6¾″	24′ 6½″
15·00	N	13′ 10½″	13′ 5½″	12′ 10¾″	12′ 2½″	11′ 4″	10′ 4½″	9′ 1½″	7′ 11¾″
	F	16′ 4″	16′ 11¼″	17′ 11¼″	19′ 5½″	27′ 3″	27′ 3½″	43′ 4¼″	148′ 11″
25·00	N	22′ 0″	21′ 0″	19′ 7″	18′ 1″	16′ 2″	14′ 3″	12′ 0″	10′ 1″
	F	29′ 0″	30′ 11″	34′ 6″	40′ 8″	55′ 7″	102′ 7″	INF	INF
50·00	N	39′ 2″	36′ 0″	32′ 3″	28′ 3″	23′ 9″	20′ 0″	15′ 9″	12′ 6″
	F	69′ 3″	81′ 9″	112′ 0″	222′ 6″	INF	INF	INF	INF
INF	N	179′ 9″	128′ 6″	90′ 0″	64′ 3″	45′ 3″	33′ 0″	22′ 9″	16′ 9″
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·0005 inch.
Object distances measured from film plane.
U = object distance sharply focused, measured in feet.
N = nearest distance in focus, measured in feet and inches.
F = farthest distance in focus, measured in feet and inches.

Depth of Field Tables - in METRES with Relation to T/Stops

50 mm. COOKE KINETAL LENS - (f/1·8) T/2·0

The following depth of field table refers specifically to this particular optical design of 50 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE							
METRES		T/2	T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
1·00	N	0·98	0·98	0·97	0·96	0·94	0·92	0·89	0·85
	F	1·02	1·02	1·03	1·05	1·07	1·10	1·15	1·22
1·10	N	1·08	1·07	1·06	1·05	1·03	1·00	0·96	0·92
	F	1·12	1·13	1·14	1·16	1·19	1·22	1·29	1·38
1·20	N	1·18	1·17	1·15	1·14	1·11	1·08	1·04	0·99
	F	1·23	1·24	1·25	1·27	1·31	1·35	1·43	1·54
1·30	N	1·27	1·26	1·25	1·23	1·20	1·16	1·11	1·05
	F	1·33	1·34	1·36	1·39	1·43	1·48	1·58	1·71
1·50	N	1·46	1·45	1·43	1·40	1·36	1·32	1·25	1·18
	F	1·54	1·56	1·58	1·62	1·67	1·75	1·89	2·09
1·70	N	1·65	1·63	1·61	1·57	1·52	1·47	1·38	1·29
	F	1·75	1·77	1·81	1·85	1·93	2·03	2·22	2·50
2·00	N	1·93	1·91	1·87	1·82	1·76	1·68	1·57	1·46
	F	2·07	2·10	2·15	2·22	2·32	2·47	2·77	3·23
2·50	N	2·40	2·36	2·30	2·23	2·13	2·02	1·86	1·70
	F	2·62	2·66	2·74	2·85	3·03	3·29	3·85	4·83
3·00	N	2·85	2·79	2·71	2·61	2·48	2·33	2·12	1·91
	F	3·17	3·24	3·36	3·52	3·81	4·23	5·21	7·19
4·00	N	3·73	3·64	3·50	3·34	3·12	2·88	2·56	2·26
	F	4·31	4·44	4·67	5·00	5·60	6·58	9·31	18·53
5·00	N	4·59	4·44	4·24	4·00	3·69	3·36	2·93	2·54
	F	5·49	5·72	6·09	6·67	7·79	9·86	17·64	342·50
8·00	N	6·99	6·66	6·21	5·71	5·08	4·48	3·74	3·13
	F	9·35	10·03	11·25	13·43	18·95	38·92	INF	INF
15·00	N	11·79	10·87	9·72	8·53	7·21	6·04	4·77	3·81
	F	20·62	24·25	32·96	63·26	INF	INF	INF	INF
INF	N	54·78	39·16	27·44	19·63	13·77	10·04	6·94	5·07
	F	INF	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·013 mm.
Object distances measured from film plane.
U = object distance sharply focused, measured in metres.
N = nearest distance in focus, measured in metres.
F = farthest distance in focus, measured in metres.

Depth of Field Tables - in Feet with Relation to T/Stops

75 mm. COOKE KINETAL LENS - (f/2·6) T/2·8

The following depth of field table refers specifically to this particular optical design of 75 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE						
FEET		T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
4·00	N	3′ 11½″	3′ 11¼″	3′ 10¾″	3′ 10¼″	3′ 9¾″	3′ 8¾″	3′ 7¾″
	F	4′ 0½″	4′ 1″	4′ 1¼″	4′ 1¾″	4′ 2½″	4′ 3¾″	4′ 5¼″
4·25	N	4′ 2¼″	4′ 2″	4′ 1¾″	4′ 1″	4′ 0½″	3′ 11½″	3′ 10¼″
	F	4′ 3¾″	4′ 4″	4′ 4½″	4′ 5″	4′ 5¾″	4′ 7¼″	4′ 9″
4·50	N	4′ 5¼″	4′ 5″	4′ 4½″	4′ 4″	4′ 3¼″	4′ 2″	4′ 0½″
	F	4′ 6¾″	4′ 7¼″	4′ 7½″	4′ 8¼″	4′ 9¼″	4′ 10¾″	5′ 1″
5·00	N	4′ 11″	4′ 10¾″	4′ 10¼″	4′ 9¼″	4′ 8½″	4′ 7″	4′ 5¼″
	F	5′ 1″	5′ 1½″	5′ 2″	5′ 3″	5′ 4″	5′ 6″	5′ 8¾″
6·00	N	5′ 10½″	5′ 10″	5′ 9¼″	5′ 8¼″	5′ 6¾″	5′ 4¾″	5′ 2½″
	F	6′ 1½″	6′ 2″	6′ 3″	6′ 4¼″	6′ 6″	6′ 9¼″	7′ 1¼″
7·00	N	6′ 10″	6′ 9¼″	6′ 8¼″	6′ 6¾″	6′ 5″	6′ 2¼″	5′ 11″
	F	7′ 2″	7′ 3″	7′ 4¼″	7′ 6″	7′ 8½″	8′ 1″	8′ 7″
8·00	N	7′ 9½″	7′ 8½″	7′ 7″	7′ 5¼″	7′ 2¾″	6′ 11¼″	6′ 7½″
	F	8′ 2¾″	8′ 3½″	8′ 5½″	8′ 8″	8′ 11½″	9′ 5½″	10′ 1¾″
10·00	N	9′ 8″	9′ 6½″	9′ 4¼″	9′ 1¼″	8′ 9¾″	8′ 4½″	7′ 10¾″
	F	10′ 4¼″	10′ 6¼″	10′ 8¾″	11′ 1″	11′ 6¾″	12′ 5¼″	13′ 8¼″
12·00	N	11′ 6¼″	11′ 4″	11′ 1″	10′ 8¾″	10′ 4″	9′ 8¾″	9′ 1″
	F	12′ 6¼″	12′ 9″	13′ 1″	13′ 7¼″	14′ 4″	15′ 8¾″	17′ 9½″
15·00	N	14′ 3″	13′ 11½″	13′ 7″	13′ 0¾″	12′ 5½″	11′ 7″	10′ 8″
	F	15′ 10″	16′ 2½″	16′ 9″	17′ 7½″	18′ 10½″	21′ 4¾″	25′ 5½″
20·00	N	18′ 8¼″	18′ 2¼″	17′ 6½″	18′ 8″	15′ 8¼″	14′ 3¾″	12′ 11¼″
	F	21′ 6¼″	22′ 2¾″	23′ 3¼″	25′ 0¼″	27 7½′″	33′ 5¼″	44′ 8¼″
35·00	N	31′ 1½″	29′ 8¾″	28′ 0½″	25′ 10¼″	23′ 6¾″	20′ 6½″	17′ 9¾″
	F	39′ 11¾″	42′ 6¾″	46′ 7″	54′ 3½″	68′ 5½″	121′ 0¼″	1547′ 11¼″
75·00	N	59′ 1¾″	54′ 3″	48′ 10¼″	42′ 6¼″	36′ 7½″	29′ 9¼″	24′ 4″
	F	102′ 6½″	121′ 8½″	162′ 0¾″	322′ 6¼″	INF	INF	INF
INF	N	277′ 10¼″	194′ 7¾″	139′ 2¼″	97′ 7″	71′ 1¼″	49′ 0½″	35′ 9½″
	F	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·0005 inch.
Object distance measured from film plane.
U = object distance sharply focused, measured in feet.
N = nearest distance in focus, measured in feet and inches.
F = farthest distance in focus, measured in feet and inches.

Depth of Field Tables - in METRES with Relation to T/Stops

75 mm. COOKE KINETAL LENS - (f/2·6) T/2·8

The following depth of field table refers specifically to this particular optical design of 75 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE						
METRES		T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
1·30	N	1·28	1·28	1·27	1·25	1·24	1·21	1·18
	F	1·32	1·33	1·34	1·35	1·37	1·41	1·46
1·40	N	1·38	1·37	1·36	1·34	1·32	1·29	1·26
	F	1·42	1·43	1·44	1·46	1·49	1·53	1·58
1·50	N	1·48	1·47	1·45	1·44	1·41	1·38	1·34
	F	1·52	1·54	1·55	1·57	1·60	1·65	1·71
1·75	N	1·72	1·70	1·69	1·66	1·63	1·58	1·53
	F	1·78	1·80	1·82	1·85	1·89	1·96	2·06
2·00	N	1·96	1·94	1·92	1·88	1·84	1·78	1·71
	F	2·05	2·06	2·09	2·13	2·19	2·29	2·41
2·50	N	2·43	2·41	2·37	2·32	2·26	2·16	2·06
	F	2·57	2·60	2·65	2·72	2·81	2·97	3·20
3·00	N	2·90	2·86	2·81	2·74	2·65	2·52	2·38
	F	3·11	3·15	3·22	3·32	3·46	3·72	4·08
3·50	N	3·37	3·31	3·24	3·15	3·03	2·86	2·68
	F	3·64	3·71	3·80	3·95	4·15	4·52	5·08
5·00	N	4·73	4·62	4·49	4·30	4·09	3·78	3·46
	F	5·30	5·45	5·65	5·98	6·45	7·44	9·10
7·00	N	4·48	6·28	6·03	5·69	5·32	4·80	4·30
	F	7·62	7·92	8·35	9·11	10·27	13·03	19·25
10·00	N	8·96	8·58	8·12	7·51	6·88	6·03	5·26
	F	11·32	12·00	13·04	14·99	18·44	29·91	118·10
25·00	N	19·33	17·62	15·77	13·63	11·65	9·39	7·63
	F	35·41	43·09	60·66	156·00	INF	INF	INF
INF	N	84·69	59·33	42·42	29·74	21·67	14·95	10·91
	F	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·013 mm.
Object distances measured from film plane.
U = object distance sharply focused, measured in metres.
N = nearest distance in focus, measured in metres.
F = farthest distance in focus, measured in metres.

Depth of Field Tables - in FEET with Relation to T/Stops

100 mm. COOKE KINETAL LENS - (f/2·6) T/2·8

The following depth of field table refers specifically to this particular optical design of 100 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE						
FEET		T/2·8	T/4·0	T/5·6	T/8·0	T/11	T/16	T22
7·00	N	6′ 11″	6′ 10½″	6′ 10″	6′ 9″	6′ 8″	6′ 6¼″	6′ 4½″
	F	7′ 1″	7′ 1½″	7′ 2¼″	7′ 3¼″	7′ 4½″	7′ 6½″	7′ 9½″
7·50	N	7′ 4¾″	7′ 4¼″	7′ 3½″	7′ 2½″	7′ 1½″	6′ 11½″	6′ 9¼″
	F	7′ 7¼″	7′ 7¾″	7′ 8½″	7′ 9¾″	7′ 11¼″	8′ 1¾″	8′ 5″
8·00	N	7′ 10½″	7′ 10″	7′ 9¼″	7′ 8″	7′ 6¾″	7′ 4½″	7′ 2″
	F	8′ 1½″	8′ 2″	8′ 3″	8′ 4¼″	8′ 6″	8′ 8¾″	9′ 0¾″
9·00	N	8′ 10¼″	8′ 9½″	8′ 8½″	8′ 7″	8′ 5¼″	8′ 2½″	7′ 11½″
	F	9′ 1¾″	9′ 2¾″	9′ 3¾″	9′ 5½″	9′ 7¾″	9′ 11½″	10′ 4½″
10·00	N	9′ 9¾″	9′ 8¾″	9′ 7¾″	9′ 6″	9′ 3¾″	9′ 0½″	8′ 8¾″
	F	10′ 2¼″	10′ 3¼″	10′ 4¾″	10′ 6¾″	10′ 9½″	11′ 2½″	11′ 8¾″
12·00	N	11′ 8¾″	11′ 7½″	11′ 5¾″	11′ 3¼″	11′ 0¼″	10′ 7½″	10′ 2¼″
	F	12′ 3¼″	12′ 4¾″	12′ 7″	12′ 10″	13′ 2¼″	13′ 9½″	14′ 7½″
15·00	N	14′ 7″	14′ 5″	14′ 2¼″	13′ 10¼″	13′ 5¾″	12′ 10¾″	13′ 3″
	F	15′ 5¼″	15′ 7¾″	15′ 11″	16′ 4¼″	16′ 11″	17′ 11½″	19′ 4¾″
20·00	N	19′ 3″	18′ 11½″	18′ 6¾″	18′ 0″	17′ 4¼″	16′ 4½″	15′ 4¼″
	F	20′ 10″	21′ 2″	21′ 8″	22′ 6″	23′ 7″	25′ 9″	28′ 10″
25·00	N	23′ 10″	23′ 5″	22′ 9″	21′ 11″	20′ 11″	19′ 7″	18′ 1″
	F	26′ 3″	26′ 11″	27′ 9″	29′ 1″	30′ 11″	34′ 9″	40′ 9″
35·00	N	32′ 9″	31′ 10″	30′ 9″	29′ 3″	27′ 7″	25′ 2″	22′ 9″
	F	37′ 7″	38′ 10″	40′ 8″	43′ 7″	48′ 0″	57′ 11″	76′ 7″
50·00	N	45′ 6″	43′ 9″	41′ 9″	39′ 0″	36′ 0″	32′ 0″	28′ 3″
	F	55′ 6″	58′ 3″	62′ 6″	69′ 9″	82′ 0″	115′ 9″	227′ 9″
100·00	N	83′ 6″	77′ 9″	71′ 6″	63′ 9″	56′ 0″	47′ 0″	39′ 0″
	F	125′ 0″	140′ 0″	166′ 7¾″	233′ 3½″	466′ 4½″	INF	INF
INF	N	497′ 6″	348′ 6″	249′ 0″	174′ 6″	127′ 0″	87′ 6″	64′ 0″
	F	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·0005 inch.
Object distances measured from film plane.
U = object distance sharply focused, measured in feet.
N = nearest distance in focus, measured in feet and inches.
F = farthest distance in focus, measured in feet and inches.

Depth of Field Tables - in METRES with Relation to T/Stops

100 mm. COOKE KINETAL LENS - (f/2·6) T/2·8

The following depth of field table refers specifically to this particular optical design of 100 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE						
METRES		T/2·8	T/4	T/5·6	T/8	T/11	T/16	T/22
2·25	N	2·22	2·21	2·19	2·17	2·14	2·09	2·04
	F	2·28	2·29	2·31	2·34	2·38	2·44	2·52
2·50	N	2·46	2·45	2·43	2·40	2·36	2·30	2·24
	F	2·54	2·56	2·58	2·61	2·66	2·74	2·84
3·00	N	2·95	2·92	2·89	2·85	2·80	2·72	2·62
	F	3·06	3·08	3·12	3·17	3·24	3·36	3·51
3·50	N	3·43	3·39	3·35	3·30	3·23	3·12	2·99
	F	3·58	3·61	3·66	3·73	3·83	4·00	4·22
4·00	N	3·90	3·86	3·81	3·73	3·64	3·50	3·35
	F	4·10	4·15	4·21	4·31	4·44	4·67	4·98
5·00	N	4·85	4·78	4·70	4·59	4·45	4·24	4·01
	F	5·16	5·24	5·34	5·50	5·71	6·11	6·66
6·00	N	5·78	5·69	5·57	5·41	5·23	4·93	4·62
	F	6·24	6·35	6·50	6·74	7·06	7·68	8·58
8·00	N	7·61	7·45	7·26	6·98	6·66	6·19	5·71
	F	8·43	8·64	8·92	9·38	10·03	11·34	13·44
10·00	N	9·39	9·16	8·86	8·44	7·98	7·32	6·65
	F	10·69	11·02	11·49	12·27	13·41	15·87	20·35
15·00	N	13·67	13·17	12·55	11·74	10·85	9·65	8·52
	F	16·62	17·43	18·64	20·81	24·35	33·97	64·64
30·00	N	25·07	23·43	21·54	19·23	16·96	14·18	11·86
	F	37·35	41·73	49·47	68·54	132·20	INF	INF
INF	N	151·60	106·20	75·91	53·20	38·74	26·70	19·47
	F	INF	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·013 mm.
Object distances measured from film plane.
U = object distance sharply focused, measured in metres.
N = nearest distance in focus, measured in metres.
F = farthest distance in focus, measured in metres.

Depth of Field Tables - in FEET with Relation to T/Stops

150 mm. COOKE KINETAL LENS - (f/3·8) T/4·0

The following depth of field table refers specifically to this particular optical design of 150 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE					
FEET		T/4	T/5·6	T/8	T/11	T/16	T/22
9·50	N	9′ 4¾″	9′ 4¼″	9′ 3½″	9′ 2½″	9′ 1¼″	8′ 11½″
	F	9′ 7¼″	9′ 7¾″	9′ 8½″	9′ 9½″	9′ 11¼″	10′ 1½″
10·00	N	9′ 10½″	9′ 10″	9′ 9¼″	9′ 8¼″	9′ 6½″	9′ 4¾″
	F	10′ 1½″	10′ 2″	10′ 3″	10′ 4″	10′ 6″	10′ 8½″
11·00	N	10′ 10¼″	10′ 9½″	10′ 8¾″	10′ 7½″	10′ 5½″	10′ 3¼″
	F	11′ 1¾″	11′ 2½″	11′ 3″	11′ 5″	11′ 7¼″	11′ 10¼″
12·00	N	11′ 10″	11′ 9¼″	11′ 8″	11′ 6½″	11′ 4¼″	11′ 1½″
	F	12′ 2″	12′ 3″	12′ 4¼″	12′ 6″	12′ 8¾″	13′ 0½″
13·00	N	12′ 9½″	12′ 8¾″	12′ 7¼″	12′ 5½″	12′ 2¾″	11′ 11¾″
	F	13′ 2½″	13′ 3½″	13′ 5″	13′ 7″	13′ 10½″	14′ 2¾″
15·00	N	14′ 8¾″	14′ 7½″	14′ 5¾″	14′ 3½″	13′ 11¾″	13′ 7½″
	F	15′ 3¼″	15′ 4¾″	15′ 6¾″	15′ 9½″	16′ 2¼″	16′ 8¼″
17·00	N	16′ 7¾″	16′ 6¼″	16′ 3¾″	16′ 1″	15′ 8¼″	15′ 3″
	F	17′ 4¼″	17′ 6¼″	17′ 9″	18′ 0½″	18′ 6¾″	19′ 2½″
20·00	N	19′ 6″	19′ 4″	19′ 1″	18′ 9″	18′ 2¼″	17′ 7¼″
	F	20′ 6″	20′ 8¾″	21′ 0½″	21′ 5¾″	22′ 2½″	23′ 2″
25·00	N	24′ 2¾″	23′ 11½″	23′ 6¼″	23′ 0¼″	22′ 2¾″	21′ 4″
	F	25′ 9¾″	26′ 1¾″	26′ 8″	27′ 4¼″	38′ 7″	30′ 2¾″
35·00	N	33′ 6¼″	32′ 11½″	32′ 1¾″	31′ 2¼″	29′ 8¾″	28′ 2″
	F	36′ 7½″	37′ 4″	38′ 5″	39′ 10½″	42′ 7″	46′ 4″
50·00	N	47′ 0″	45′ 11″	44′ 4″	42′ 6″	39′ 10″	37′ 0″
	F	53′ 5″	54′ 11″	57′ 4″	60′ 9″	67′ 3″	77′ 3″
75·00	N	68′ 5″	66′ 1″	62′ 10″	59′ 3″	54′ 2″	49′ 1″
	F	83′ 0″	86′ 9″	93′ 0″	102′ 3″	122″ 5′	160′ 4″
125·00	N	107′ 7″	101′ 11″	94′ 5″	86′ 7″	76′ 0″	66′ 3″
	F	149′ 3″	161′ 9″	185′ 0″	225′ 9″	355′ 9″	INF
INF	N	765′ 0″	547′ 0″	383′ 0″	279′ 0″	192′ 0″	140′ 0″
	F	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·0005 inch.
Object distances measured from film plane.
U = object distance sharply focused, measured in feet.
N = nearest distance in focus, measured in feet and inches.
F = farthest distance in focus, measured in feet and inches.

Depth of Field Tables - in METRES with Relation to T/Stops

150 mm. COOKE KINETAL LENS - (f/3·8) T/4·0

The following depth of field table refers specifically to this particular optical design of 150 mm. lens, since allowance has been made for the position of its front nodal point relative to the film plane.

U		APERTURE					
METRES		T/4	T/5·6	T/8	T/11	T/16	T/22
2·80	N	2·77	2·76	2·74	2·72	2·69	2·64
	F	2·83	2·84	2·86	2·89	2·93	2·98
3·00	N	2·97	2·95	2·93	2·91	2·87	2·82
	F	3·04	3·05	3·07	3·10	3·15	3·21
3·25	N	3·21	3·19	3·17	3·14	3·09	3·04
	F	3·29	3·31	3·34	3·37	3·42	3·49
3·50	N	3·45	3·43	3·41	3·37	3·32	3·26
	F	3·55	3·57	3·60	3·64	3·70	3·79
4·00	N	3·95	3·91	3·88	3·83	3·76	3·68
	F	4·07	4·09	4·13	4·18	4·27	4·38
4·50	N	4·42	4·39	4·34	4·29	4·20	4·10
	F	4·58	4·62	4·67	4·74	4·85	5·00
5·00	N	4·90	4·86	4·81	4·74	4·63	4·50
	F	5·10	5·15	5·21	5·29	5·44	5·62
6·00	N	5·86	5·80	5·72	5·62	5·47	5·29
	F	6·15	6·21	6·31	6·43	6·65	6·93
8·00	N	7·74	7·65	7·51	7·34	7·07	6·78
	F	8·27	8·39	8·57	8·80	9·22	9·78
10·00	N	9·60	9·45	9·23	8·98	8·58	8·15
	F	10·43	10·62	10·91	11·29	12·00	12·97
15·00	N	14·11	13·78	13·32	12·79	11·99	11·16
	F	16·01	16·45	17·17	18·15	20·06	22·97
25·00	N	22·61	21·78	20·64	19·37	17·58	18·84
	F	27·96	29·35	31·72	35·28	43·39	59·92
40·00	N	34·19	32·31	29·86	27·27	23·84	20·72
	F	48·21	52·52	60·66	72·24	125·50	631·90
INF	N	233·40	166·80	116·90	85·07	58·58	42·68
	F	INF	INF	INF	INF	INF	INF

Diameter of Disc of Confusion = 0·013 metres.
Object distances measured from film plane.
U = object distance sharply focused, measured in metres.
N = nearest distance in focus, measured in metres.
F = farthest distance in focus, measured in metres.

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