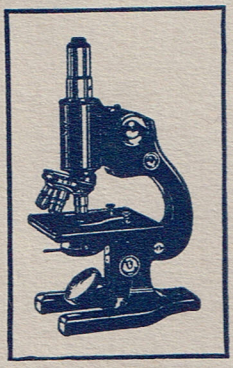
1941



The Effective Use

AND PROPER CARE OF

THE MICROSCOPE

1941

Spencer Microscope Objectives

Cat. No.	Equivalent Focus mm.	Initial Magnification	Numerical Aperture	Working Distance mm.	Real Field* mm.	Type
			Achromatic Objectives			
101	48	2.2	0.08	52.5	7.0	Dry
102	40	2.8	0.08	35.2	5.3	Dry
103§	32, 14	4, 12	0.12, 0.24	31.5, 5.6	3.0, 1.1	Dry
104	32	4.0	0.10	21.0	4.0	Dry
105	30.2	3.5	0.09	24.1	4.2	Dry
106	24	3.5	0.08	4.2	4.3	Dry
107	25	5.1	0.17	21.0	2.8	Dry
108§	16, 32	10, 4	0.25, 0.10	4.5	1.5	Dry
111‡	16, 32	10, 4	0.25, 0.10	4.5	1.5	Dry
112	8	20	0.50	1.44	0.7	Dry
115	4	44	0.66	0.63	0.34	Dry
118	4	45	0.85	0.20	0.34	Dry
122	3	60	0.85	0.20	0.26	Dry
125	3	60	1.25	0.25	0.26	Oil Imm.
127†	1.8	95	1.25	0.13	0.15	Oil Imm.
128	1.5	115	1.25	0.10	0.12	Oil Imm.
			Semi-Apochromatic (Fluorite) Objectives			
120	4	44	0.85	0.52	0.29	Dry
130	1.8	97	1.30	0.10	0.14	Oil Imm.
			Apochromatic Objectives			
150	16	10	0.30	5.2	1.29	Dry
152	8	20	0.60	0.75	0.60	Dry
154	4	44	0.95	0.20	0.29	Dry
156	3	60	0.95	0.16	0.20	Dry
161	3	60	1.30	0.20	0.20	Oil Imm.
162	3	60	1.40	0.17	0.20	Oil Imm.
158†	2	90	1.30	0.10	0.14	Oil Imm.
159	2	90	1.40	0.05	0.14	Oil Imm.
160	1.5	120	1.30	0.08	0.11	Oil Imm.

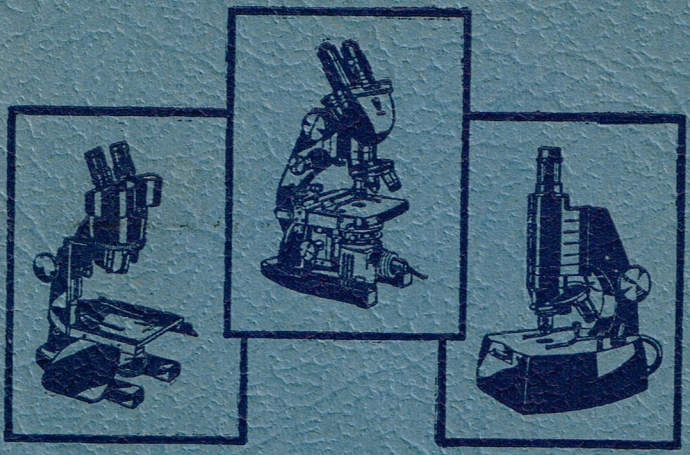
* Achromats with 10X Huyghenian eyepiece, Fluorites and apochromats with 10X Compensating eyepiece.

§ Separable objective screw mounting.

‡ Separable objective stirrup mounting.

† Can be supplied either with or without iris diaphragm.

1949



The Effective Use

AND PROPER CARE OF

THE MICROSCOPE

1949

AO SPENCER MICROSCOPE OBJECTIVES

Achromatic Objectives

Cat. No.	Equivalent Focus mm	Initial Magnification	Type	Numerical Aperture	Real Field† mm	Working Distance in mm
101	48	2	Dry	0.08	7.0	52.5
102	40	3	Dry	0.08	5.3	35.2
104	32	4	Dry	0.10	4.0	21.0
105	30	3.5	Dry	0.09	4.2	25.4
106	24	3.4	Dry	0.08	4.3	3.7
107	25	5	Dry	0.14	2.8	16.7
109	16	10	Dry	0.25	1.5	6.8
110	16-32	10, 4.2	Dry (separable)	0.25, 0.10	1.5	6.8, 25
112	8	20	Dry	0.50	0.7	1.3
115	4	43	Dry	0.66	0.34	0.73
118	4	43	Dry	0.85	0.34	0.18
122	3	57	Dry	0.85	0.26	0.12
127	1.8	97	Oil Immersion	1.25	0.15	0.12
1292**	1.8	97	Oil Immersion	1.25	0.15	0.13

Fluorite Semi-Apochromatic Objectives

130	1.8	93	Oil Immersion	1.30	0.14	0.13

Apochromatic Objectives

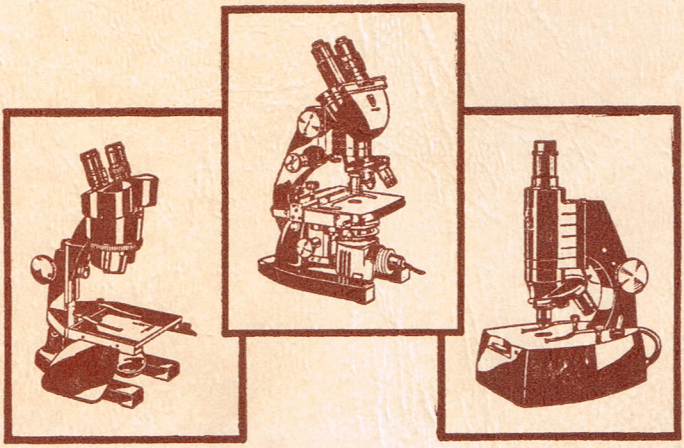
150	16	10	Dry	0.30	1.29	5.2
152	8	20	Dry	0.60	0.60	0.65
154*	4	43	Dry	0.95	0.29	0.15
156*	3	56	Dry	0.95	0.20	0.11
158	2	90	Oil Immersion	1.30	0.14	0.08
159	2	90	Oil Immersion	1.40	0.14	0.05
160	1.5	120	Oil Immersion	1.30	0.11	0.07
161	3	56	Oil Immersion	1.30	0.20	0.10
1299**	2	90	Oil Immersion	1.30	0.14	0.08

* Furnished in Cover Glass Correction Collar Adjustment Mounts.

** With Built-in Iris Diaphragm.

† Achromats with 10X Huyghenian eyepiece, fluorite and apochromats with 10X compensating eyepiece.

1954



The Effective Use

AND PROPER CARE OF

THE MICROSCOPE

1954

AO SPENCER MICROSCOPE OBJECTIVES

Achromatic Objectives

Cat. No.	Equivalent Focus mm	Initial Magnification	Type	Numerical Aperture	Real Field† mm	Working Distance in mm
101	48	2	Dry	0.08	7.0	52.5
102	40	3	Dry	0.08	5.3	35.2
104	32	4	Dry	0.10	4.0	21.0
105	30	3.5	Dry	0.09	4.2	25.4
106	24	3.4	Dry	0.08	4.3	3.7
107	25	5	Dry	0.14	2.8	16.7
109	16	10	Dry	0.25	1.5	6.8
110	16-32	10, 4.2	Dry (separable)	0.25, 0.10	1.5	6.8, 25
112	8	20	Dry	0.50	0.7	1.3
115	4	43	Dry	0.66	0.34	0.73
118	4	43	Dry	0.85	0.34	0.18
122	3	57	Dry	0.85	0.26	0.12
127	1.8	97	Oil Immersion	1.25	0.15	0.12
1292**	1.8	97	Oil Immersion	1.25	0.15	0.13

Fluorite Semi-Apochromatic Objectives

130	1.8	93	Oil Immersion	1.30	0.14	0.13

Apochromatic Objectives

150	16	10	Dry	0.30	1.29	5.2
152	8	20	Dry	0.60	0.60	0.65
154*	4	43	Dry	0.95	0.29	0.15
156*	3	56	Dry	0.95	0.20	0.11
158	2	90	Oil Immersion	1.30	0.14	0.08
159	2	90	Oil Immersion	1.40	0.14	0.05
160	1.5	120	Oil Immersion	1.30	0.11	0.07
161	3	56	Oil Immersion	1.30	0.20	0.10
1299**	2	90	Oil Immersion	1.30	0.14	0.08

* Furnished in Cover Glass Correction Collar Adjustment Mounts.

** With Built-in Iris Diaphragm.

† Achromats with 10X Huyghenian eyepiece, fluorite and apochromats with 10X compensating eyepiece.

1958

THE MICROSCOPE

THE MICROSCOPE

SPENCER

THE EFFECTIVE USE

AND PROPER CARE OF

THE MICROSCOPE

1958

AO SPENCER MICROSCOPE OBJECTIVES

Achromatic Objectives

Cat. No.	Equivalent Focus mm	Initial Magnification	Type	Numerical Aperture	Real Field† mm	Working Distance in mm
101	48	2	Dry	0.08	7.0	52.5
102	40	3	Dry	0.08	5.3	35.2
104	32	4	Dry	0.10	4.0	21.0
105	30	3.5	Dry	0.09	4.2	25.4
107	25	5	Dry	0.14	2.8	16.7
109	16	10	Dry	0.25	1.5	6.8
110	16-32	10, 4.2	Dry (separable)	0.25, 0.10	1.5	6.8, 25
111#	16	10	Dry	0.25	0.30	8.4
112	8	20	Dry	0.50	0.7	1.3
115	4	43	Dry	0.66	0.34	0.73
116#	4	43	Dry	0.53	0.35	0.73
125	3.6	50	Oil Immersion	0.95	0.30	0.37
127	1.8	97	Oil Immersion	1.25	0.15	0.12
1292**	1.8	97	Oil Immersion	1.25	0.15	0.13

Reflecting Objectives

1200	3.5	50	Dry	0.56	0.30	2.8

Apochromatic Objectives

150	16	10	Dry	0.30	1.29	5.2
152	8	20	Dry	0.60	0.60	0.65
154*	4	43	Dry	0.95	0.29	0.15
158	2	90	Oil Immersion	1.30	0.14	0.08
159	2	90	Oil Immersion	1.40	0.14	0.05

* Furnished in Cover Glass Correction Collar Adjustment Mounts.

** With Built-in Iris Diaphragm.

† Achromats with 10X Huygenian eyepiece, fluorite and apochromats with 10X compensating eyepiece.

Achromatically corrected.