



Designation: ~~E211 – 82 (Reapproved 2010)~~ E211 – 82 (Reapproved 2016)

Standard Specification for Cover Glasses and Glass Slides for Use in Microscopy¹

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1. Scope

- 1.1 This specification describes glass covers and slides for use in routine microscopy.
- 1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

2. Glass

2.1 *Cover Glass*—Glass shall be colorless, transparent glass, sufficiently free of pits, bubbles, or cloudiness so as not to interfere with end-use performance. Such defects shall be regarded as major defects and limited accordingly. Inspection shall be by the unaided eye in a good light viewing a single cover glass at a time. Refractive index at sodium D line (589.3 nm) shall be 1.523 ± 0.005 .

2.2 *Glass Slides*—Glass slides covered by this specification shall consist of colorless, transparent glass which may have a slight greenish tint when viewed edgewise. It shall be sufficiently free of pits, nicks, bubbles, striae, scratches, and cloudiness when observed by the unaided eye so as not to impair end-use performance. Index of refraction at the sodium D line (589.3 nm) shall be 1.50 to 1.54.

3. Dimensions

- 3.1 *General Use*—The dimensions of cover glass for general use shall be as follows:
 - 3.1.1 *Square*—22 mm on a side.
 - 3.1.2 *Rectangular*—22 by 30, 22 by 40, 22 by 50, or 22 by 60 mm and 24 by 30, 24 by 40, 24 by 50, and 24 by 60 mm.

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3.1.3 *Thickness*—The thickness shall be as follows:

Number	Thickness, mm
1	0.13 to 0.17
1½ ^A	0.16 to 0.19
2	0.17 to 0.25

^A Specified as optimum by most microscope manufacturers.

3.2 *Limited Use*—The following sizes while recognized, find limited use and are generally not as readily available.

3.2.1 *Square*—18, 24 and 25 mm on a side.

3.2.2 *Rectangular*—24 by 55 mm, 35 by 50 mm, 45 by 50 mm, 20 by 26 mm and 20 by 40 mm.

3.2.3 *Circular*—18, 22 or 25 mm in diameter.

3.2.4 *Thickness*—Thickness Number 0, 0.08 to 0.13 mm.

3.3 *Tolerance*—Tolerance on dimensions other than thickness shall be ± 0.5 mm.

3.4 *Blood Counting Chambers*—The dimensions of cover glasses for blood counting chambers shall be as follows:

Length, mm ^A	width, mm ^A	Thickness, mm ^B
20	21	0.4 or 0.6
20	26	0.4 or 0.6
25	28	0.4 or 0.6

^A The tolerance on length and width shall be ± 1.0 mm.

^B The tolerance on thickness shall be ± 0.06 mm.

4. Planeness

4.1 *General Use*—Cover glass may be expected to pass the test as described in 14.1.

4.2 *Blood Counting Chambers*—Cover glass shall be plane within 0.002 mm on both sides and shall pass the planeness test as described in 16.2.

5. Corrosion Resistance

5.1 While no corrosion tests for cover glasses are hereby required, when desired for critical use, use the test in 14.2.

6. Dimensions

6.1 *General Use:*

6.1.1 *Size*—75.5 by 25.5 ± 0.8 mm.

6.1.2 *Thickness A*—1.0 ± 0.15 mm.

Thickness B—1.2 ± 0.15 mm.

6.2 *Darkfield and Interference Microscopy:*

6.2.1 *Size*—75.5 by 25.5 ± 0.8 mm.

6.2.2 *Thickness C*—1.20 ± 0.005 mm.

Thickness D—0.90 ± 0.075 mm.

Thickness E—1.50 ± 0.05 mm.

6.3 *Embryology*—37.5 ± 0.8 or 50.5 ± 0.8 by 75.5 ± 0.8 mm.

6.3.1 *Thickness*—Same as either thickness A or thickness B in 6.1 on general-use glass slides.

6.4 *Petrography:*

6.4.1 *Size*—25.5 by 45.5, 27 by 46, or 28 by 48 ± 0.8 mm.

6.4.2 *Thickness*—Same as thickness A or B under general-use slides.

7. Planeness and Parallelism

7.1 *General Use*—No requirements.

7.2 *Darkfield, Interference, Embryology, Petrography*—No requirements.

8. Corrosion Resistance

8.1 *General Use and Darkfield and Interference Microscopy*—The slides shall not be adversely affected by boiling nor shall they exhibit any pink color in the solubility test.

8.2 *Embryology, Petrography*—No requirements.