ASTROPRIBOR

Achromatic Waveplates

- ✦ Wide spectral range
- ✦ Excellent polarization properties
- ✦ Wide angle aperture
- ✦ Compact design

- ❑ change the state of polarized light
- ❑ convert linearly polarized light to circularly polarized one and vice versa (quarter-waveplates)
- ❑ rotate the plane of polarization through a given angle and convert left circular polarization to right one and vice versa (half-waveplates)

Astropribor Achromatic Waveplates (APAWs) have been successfully used for astronomical polarimetric observations at major observatories in different countries over many years as well as in a number of scientific research institutes. Optical properties of APAWs are estimated by users as the best, nearly ideal.

APAWs are multicomponent optical systems consisting of birefringent elements.

APAWs include five components manufactured of polymethyl-methacrylate (PMMA). PMMA anisotropy is introduced by single-axis stretching. Phase shift of each component does not exceed 180° in the first order, and optical axes of all plates are oriented relative to one another in a specific way. Both faces of APAWs are protected from mechanical damage with glued covers made of isotropic optical quality glass.

Specification

Phase shift	90°, 127°, 180°	Wavefront deformation	< 1 wave per cm
Spectral range of achromatization	400 ÷ 800 nm	Operation temperature range	−20 ÷ +35 °C (−4 ÷ 95°F)
Phase shift tolerance	±3°	Beam deviation	< 15 arcsec
Angle aperture	±10°	Diameter (d)	15 ÷ 60 mm (0.6 ÷ 2.4")
Laser power handling capability	Low	Thickness (t)	5 ÷ 10 mm (0.2 ÷ 0.4")

Typical optical parameters of APAWs

λ, nm	Phase shift, degrees	Optical axis, degrees	Transmission, %
360	84.3	3.4	78.5
380	88.6	1.6	83.6
400	91.0	0.4	89.6
450	91.4	0	92
500	92.3	0	91.6
550	93.1	0	91

λ, nm	Phase shift, degrees	Optical axis, degrees	Transmission, %
600	93.1	−0.2	89.5
650	93.2	−0.6	89.8
700	91.5	−1.0	88.8
750	89.9	−1.5	83.2
800	87.3	−1.8	82

Astropribor manufactures APAWs for various spectral ranges: 350÷700; 400÷800; 430÷900; 500÷1150; 570÷1300; 650÷1450; 700÷1600 nm. Phase shift tolerance does not exceed 3° within any indicated spectral range. Beyond these spectral ranges phase deviation decreases smoothly. APAWs with an expanded spectral range of achromatization as well as APAWs with any phase shift in the range 0 to 180° can be manufactured by special order.

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