

# Visible Quarter-wave Plates

QWP Series Datasheet



Waveplates (mounting optional)

## Applications

- Projection Display
- Ellipsometry
- Widefield polarimetry
- Optical Isolators
- Remote Sensing
- Astronomical Instrumentation
- Laser/high heat light sources
- Microscopy/mineralogy
- Imaging

## Standard Product Options

Product Name	Description
QCB000EC	450 nm QWP (High Transmission)
QCG000EC	550 nm QWP (High Transmission)
QCR000EC	650 nm QWP (High Transmission)

Moxtek® quarter-wave plates are manufactured using Moxtek Nanowire® technology, delivering exceptional phase-shift performance and uniformity. These inorganic quarter-wave plates are particularly well-suited for high-temperature applications, offering a broader angular range than organic waveplates. Moxtek manufactures high-volume optical products designed for a wide variety of demanding applications, including projection display, imaging, analytics, automotive, medical, research, laser systems, and telecommunications.

Features	Benefits
Nanowire® Technology	Brightness and contrast uniformity
	Widefield - Broad, $\leq 3.0^\circ$ phase deviation over $\pm 30^\circ$ AOI Range
Inorganic	Very high heat resistance
	No damage noted whatsoever, with max laser damage threshold testing powers:
	180 kW/cm <sup>2</sup> at 455 nm 4.5 MW/cm <sup>2</sup> at 532 nm

## General Specifications

<i>Wavelength Range:</i>	450 $\pm$ 7.0 nm or 550 $\pm$ 7.0 nm or 650 $\pm$ 7.0 nm (within $\pm 3.0^\circ$ phase shift)
	NOTE: Other wavelengths are available upon request
<i>Substrate Type:</i>	Display grade glass
<i>Thickness:</i>	0.7 $\pm$ 0.07 mm
<i>Index of Refraction:</i>	1.5198 (435.8 nm) 1.5078 (643.8 nm)
<i>Thermal Expansion:</i>	31.7 x 10 <sup>-7</sup> /°C (0 - 300°C)
<i>AR Coating:</i>	Standard on backside only
<i>Maximum Temperature:</i>	350°C > 1,000 hours, no damage noted
<i>Fast Axis Orientation:</i>	Oriented at 45° or parallel to the part edge
<i>Fast/Slow Axis Tolerance:</i>	$\pm 1^\circ$
<i>Dimensional Tolerance:</i>	$\pm 0.2$ mm
<i>Edge Exclusion:</i>	2 mm
<i>Transmitted Wavefront Distortion:</i>	$\leq \lambda/4$
<i>RoHS:</i>	Compliant
<i>Operating Temperature:</i>	-40°C to 350°C
<i>Total Reflectance:</i>	$\leq 3.0\%$
<i>Retardance Change for</i>	
<i>450nm at 30° Tilt:</i>	$\leq 3.0^\circ$
<i>550nm at 30° Tilt:</i>	$\leq 3.0^\circ$
<i>650nm at 20° Tilt:</i>	$\leq 3.0^\circ$

\* Do not touch or clean the top surface otherwise the waveplate will be damaged.



# Performance Specifications

PRODUCT	At Target Wavelength and Normal Incidence		
	T% (min)	R% (max)	PS Tolerance at Normal Incidence (deg)
QCB000EC (450 nm Quarter-wave Plate)	97.0	3.0	90 ± 3.0°
QCG000EC (550 nm Quarter-wave Plate)	97.0	3.0	90 ± 3.0°
QCR000EC (650 nm Quarter-wave Plate)	97.0	3.0	90 ± 3.0°

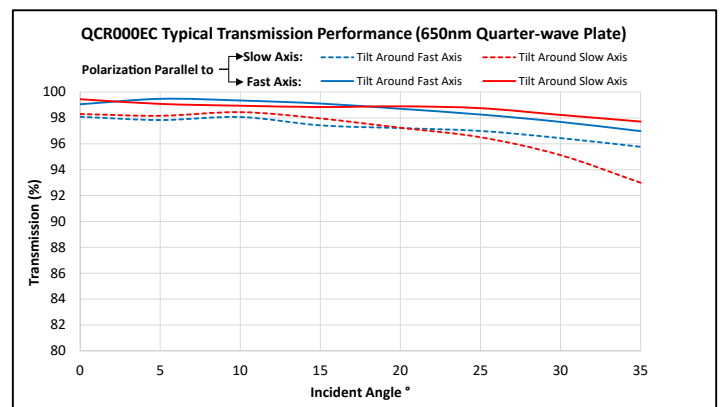
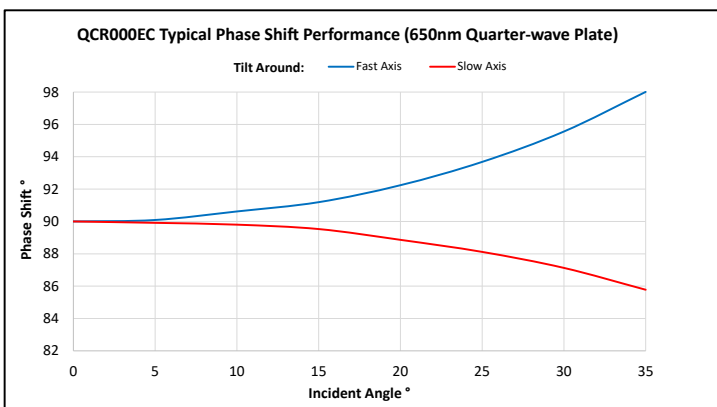
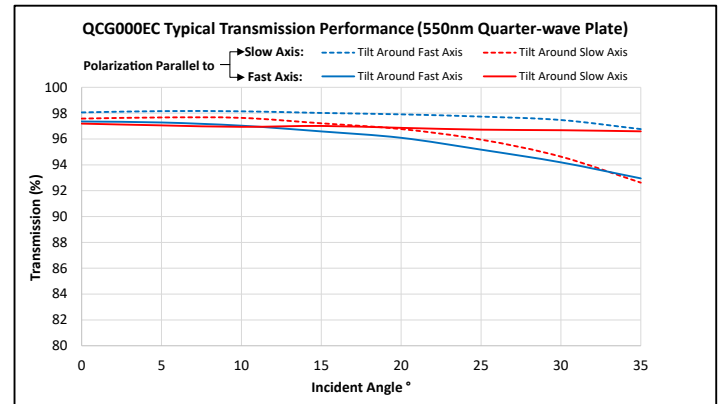
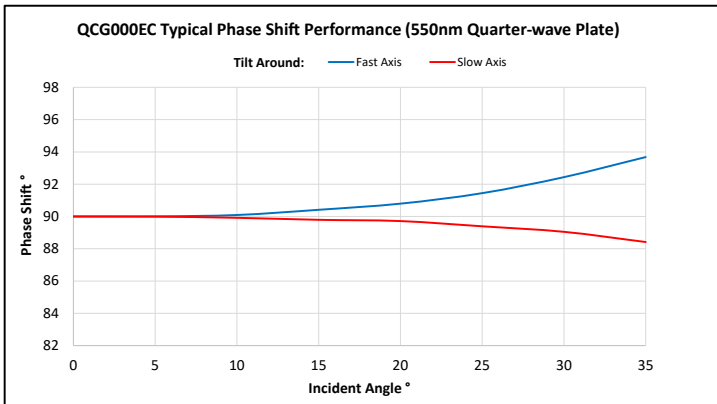
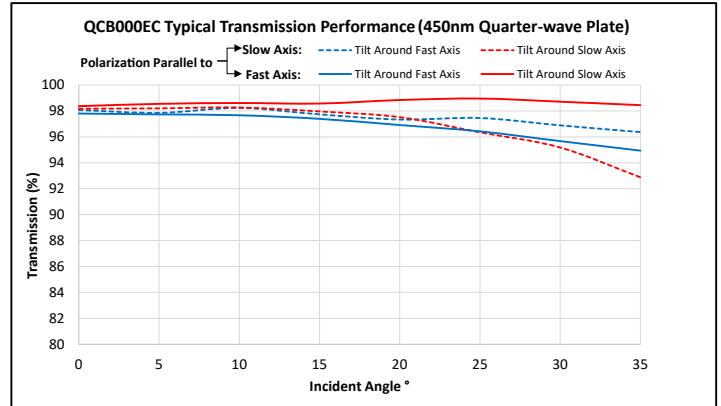
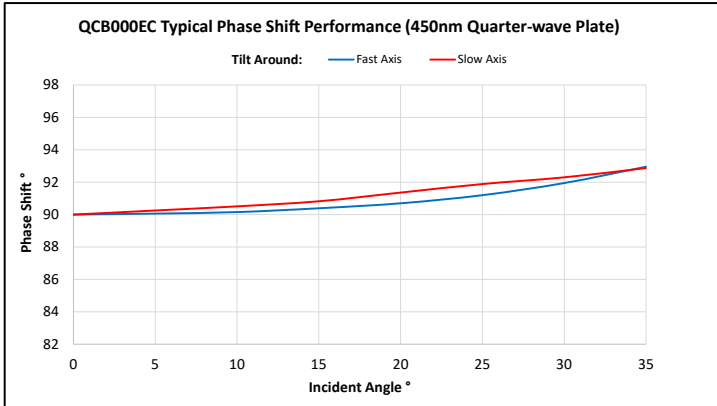
T – Transmission through the waveplate at any given incident polarization.

R – Value of total maximum reflection.

PS - Phase Shift difference between the fast and slow axis of transmission. 90 deg = ¼ wave of retardation.

\* Products only available in limited quantities

## Example Optical Performance (0-35°)



**Moxtek, Inc.**  
452 West 1260 North  
Orem, UT 84057  
P 801.225.0930  
moxtek.com

Performance data was taken from sample evaluations. Some part-to-part variation is expected.  
For warranty and ordering information, please visit [moxtek.com](http://moxtek.com).