

THz Waveplates

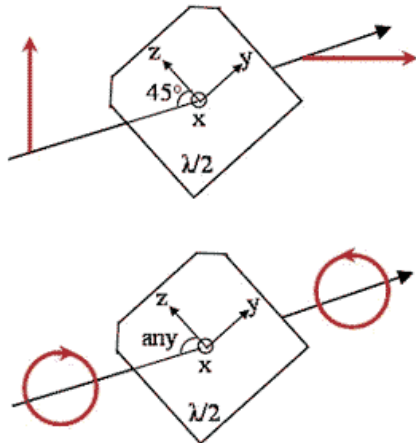
Polarimetry technique is very important for analyzing THz radiation (divergence, spatial or frequency modes, and profiles). The key instrument in polarimetry is a polarization modulator, which identifies and measures polarized signals.

Plano-plano plates, made of birefringent material, are used to modify polarization state of radiation. The waveplate works by shifting the phase between two perpendicular polarization components of the wave. The most common types of waveplates are a half-wave plate ($\lambda/2$ plate) and a quarter-wave plate ($\lambda/4$ plate). A half-wave plate gives phase delay π and a quarter-wave plate - $\pi/2$. A half-wave plate changes the polarization direction of linear polarized light. A quarter-wave plate changes linearly polarized light to circular and vice versa.

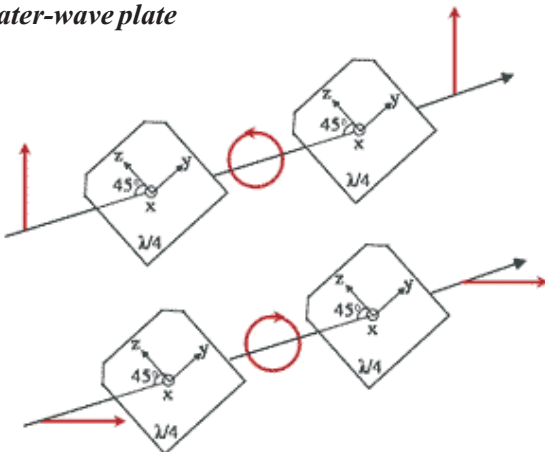
The waveplate will not change the polarization of linearly polarized beam if the polarization direction is along one of the waveplate axes.

Operating principle of half-wave and quarter-wave plates is shown below.

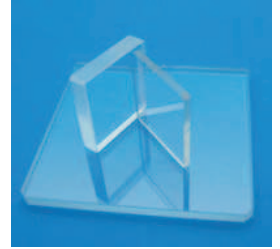
half-wave plate



quarter-wave plate



Tydex offers the THz waveplates for single operation wavelength.



Common specification:

| | |
|---------------------------------|---------------------------------|
| Material | THz grade crystal quartz |
| Orientation | x-cut |
| Orientation tolerance, arc. min | +/- 10 |
| Dimensions tolerance, mm | +/-0.25 |
| Clear aperture, % | >=90 |
| Parallelism, arc. min | 5 |
| Surface quality, scr/dig | 60/40 |
| TWD, λ @633nm | 1/2 |

The following monochromatic THz waveplates are available from stock:

| Retardation type, λ | Dimensions, mm | Operation wavelength, μm |
|-----------------------------|----------------|-------------------------------------|
| 1/2 & 1/4 | 20x20 | 35.0 |
| | | 76.0 |
| | | 90.5 |
| | | 148.0 |
| | | 280.0 |
| | | 385.0 |
| 1/2 | 20x20 | 496.0 |
| | | 118.0 |
| | | 242.0 |
| 1/4 | 20x20 | 288.0 |
| | | 61.5 |
| | | 118.0 |
| 1/2 | 50x50 | 200.0 |
| | | 210.0 |
| | | 219.2 |
| | | 228.5 |

Please check the Optics stock at our website. Alternate sizes and custom designs are available upon request. For price quotation and delivery please fax or e-mail us.



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