

# Reflective Circular Polarizing Beamsplitter

RCPBS Technical Note

## Introduction

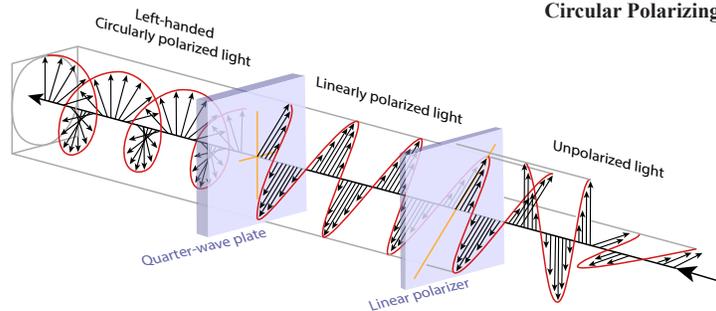
Moxtek's Reflective Circular Polarizing Beamsplitter (RCPBS) provides a solution for many innovative optical applications. The Moxtek RCPBS family of products can be used to increase optical path length without increasing physical length, isolate or sample back reflections and other potential applications.



Mounted Moxtek Reflective Circular Polarizing Beamsplitter

## Technical Highlights:

- Increase optical path length
- Isolate or sample back reflections
- Moxtek wire-grid polarizer
- Broadband performance
- Wide angle of incidence
- Pancake design
- High contrast



Circularly polarized light created by unpolarized light passing through a linear polarizer and secondly passing through a QWP.

## Moxtek Circular Polarizer Manufacturing Capabilities

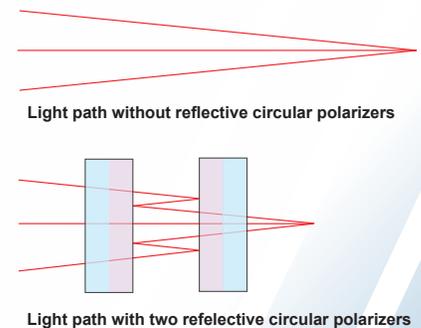
Moxtek has recently demonstrated the ability to produce custom RCPBS based on proven wire-grid beamsplitting technology. Moxtek as a supplier of RCPBS has a number of advantages:

- In house manufacturing of wire-grid polarizers and close relationships with QWP manufacturers, reducing concerns about supply and ability for wavelength ranges to be customized
- A high degree of reflectance, useful in applications where the rejected/reflected beam is used
- Custom sizes up to Ø200mm
- Demonstrated capability to provide circular polarizers in high volume at relatively low cost

## Applications of RCPBS

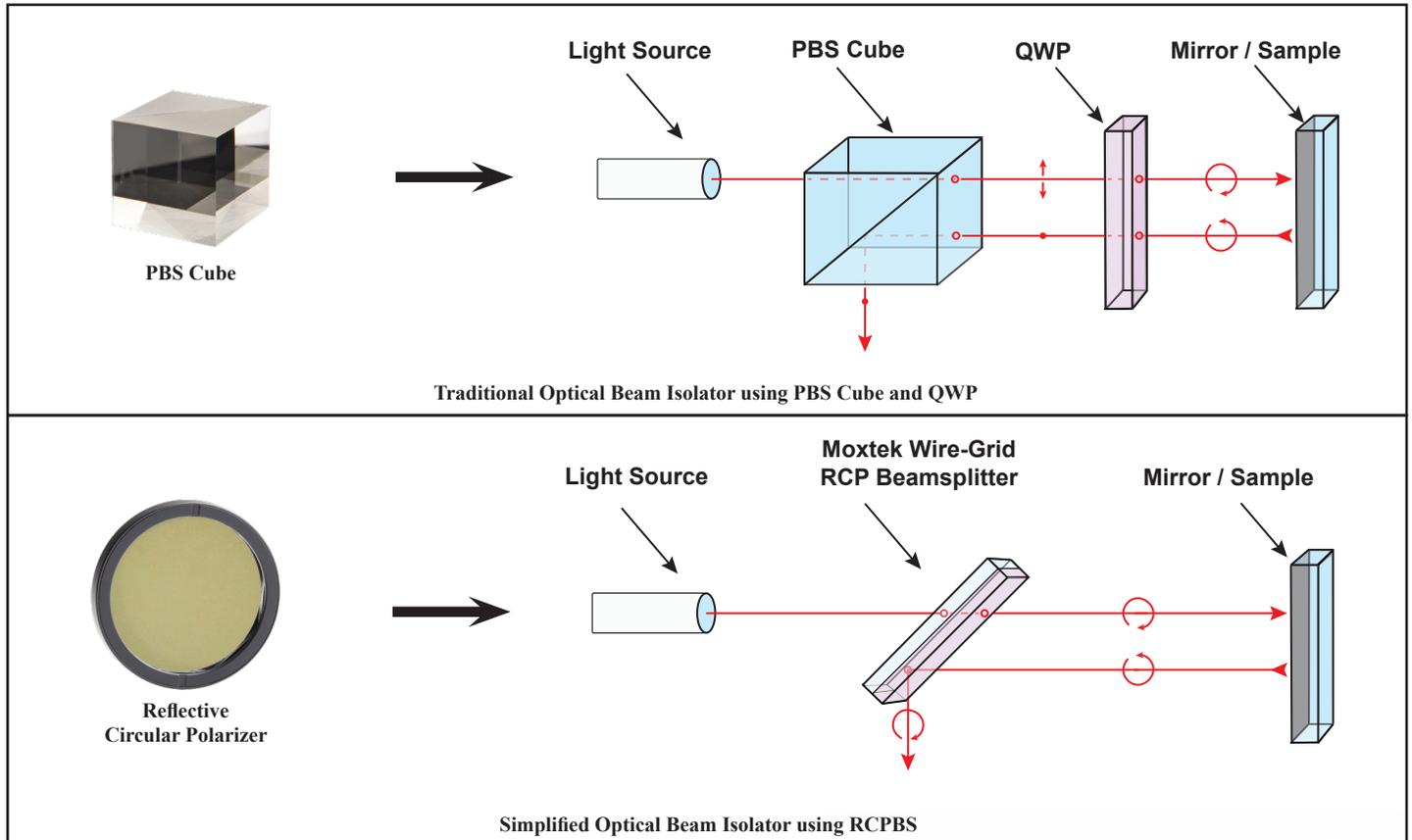
### Pancake Optical Designs

Pancake optical designs take advantage of the fact that when circularly polarized light reflects off a surface it changes handedness, or in other words it changes polarization state. Optical designers take advantage of that to shrink the amount of air space or even double the effect of optical components with power.



## Optical Isolation

In optical systems that are sensitive to back-reflections it is necessary to optically isolate the sensitive section of the system. When this is necessary one option is to use a circular polarizer to provide the optical isolation. Once the light is circularly polarized, light reflecting off of optics further along the optical path the polarization changes handedness. The circular polarizer then filters this back reflected light. Moxtek's RCPBS simplifies and shrinks the optics size in the system from a PBS cube and separate QWP to a single optic assembly. For example, in range-finding where a beam of light is sent and the light reflected back into the system needs to be sampled, placing a reflective circular polarizer in the system can help achieve this.



↕ P - Polarization    ↻ Circular Polarization    • S - Polarization

## Summary

Reflective circular polarizing beamsplitters can be a powerful tool in solving unique optical needs. Their advantages include increasing optical path length without physically lengthening the system, and reflect or filter specific polarization states. Microscopy, chemical presence detection, improved target identification, improved facial recognition, and many other fields benefit from the use of circular polarizers. Moxtek can manufacture custom reflective circular polarizers in sizes up to Ø200mm.



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