Working with SWIR Optics

Using lenses optimised for the Short Wave Infrared (SWIR) wavelength band (0.9 to 1.7 µm) offers unique advantages for a growing number of imaging applications that have been previously poorly served by general visible or infrared optics.

SWIR differs from Mid Wave Infrared (MWIR) and Long Wave Infrared (LWIR) light. Whereas MWIR and LWIR light is emitted by an object, SWIR light is reflected or absorbed by an object and produces a high contrast image. When imaging at SWIR wavelengths, certain materials such as silicon are transparent. Colours that appear almost identical to the eye may be easily differentiated using SWIR. SWIR lenses are also used where visible wavelength detectors or cameras are not sensitive enough to provide the required finite detail recognition.

As a consequence, SWIR lenses are quietly earning a growing place in imaging applications including produce sorting, surveillance, quality control and inspection.

At Resolve Optics, over the last 10 year, we have developed a series of bespoke designed SWIR lenses for sensor, instrument and camera manufacturers looking to deliver the full advantages of SWIR technology with their products.

Recently we were asked to design and supply a Day/Night lens that covered the visible (400 -700 nm) and SWIR (0.9 – 1.4 µm) wavebands. The application was to provide a view of the underside of a vertical take-off and landing aircraft enabling the flight crew to see if there were any obstruction such as holes or rocks in the landing area even in low light or foggy conditions.

It is our aim that all our specialist SWIR lens designs offer high-resolution operation at lower light levels as well as superior image quality, better transmission, and performance compared to general infrared and visible lens.

Learn more about SWIR optics: **click here**.