

# Palm-held SWIR Spectrometer For Identification And Classification Of Materials

APPLICATION NOTE



Today, Recycling issues surrounding environmental sustainability has gained world-wide importance. As developing countries refuse to take in waste, more plastics and other recyclable materials are ending up in landfills, incinerators, or simply littering the environment. The rising costs to haul away recyclable materials increasingly render the practice unprofitable, as well it is aggravating the burden on local department. In England, more than half a million more tons of plastics and other household garbage were burned last year. Australia's recycling industry is facing a crisis as the country struggles to handle the 1.3 million-ton stockpile of recyclable waste. The United States 2018 EPA Report on the Environment found significant parts of landfill consists of various types of material that could be recycled given the right sorting infrastructure.

Globally, there is an urgent need to find a way to reduce the harm of the plastics waste on our environment. The ability to expand recycling ability starts with an ability to identify and classify scrap materials. To be able to address this critical issue for identifying scrap materials in a meaningful way, requires the analysis to be implemented on site, so the identifications and subsequent sorting decisions can be made rapidly. To meet these requirements, the analysis must be cost-effective, able to be performed on-site, and to have the technology and analytical results accessible to a wide range of users all over the world.

## Palm Size SWIR Spectrometer Goes to 2500 nm

The **Breeze-L™** device from BaySpec meets the requirements to transform global recycling capabilities and reduce recycling waste. BaySpec's first smart palm-held spectrometer device, Breeze™, was made for the 400-1700 nm range. Breeze-L™ has taken the transformative technology and portability of Breeze™ and upgraded the reach to the long end of 2500 nm featured in the Short-Wave Infrared (SWIR) range. This upgraded wavelength reach allows Breeze-L™ to operate at the 1300 nm-2500 nm range, which encompasses the range for identification of recyclable waste in addition to other materials such as illicit drugs, pharmaceuticals, explosives, biological warfare agents, medicines, and foods.

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The palm-held Breeze-L™ device is designed to be used by anyone, who does not need to be technical, as well as regardless of the person's scientific background or experience. A simple one-button operation allows the user to perform highly efficient spectroscopic analysis with maximum sensitivity and ultrafast spectroscopic acquisition. Breeze-L™ requires little-to-no sample preparation and performs the measurement and spectral matching automatically to achieve the recognition and classification of plastics and other materials immediately, through library/database/AI chemometrics. The analysis can be done anywhere and anytime, eliminating the need for laboratories, and waiting for results.



Cloud-based AI chemometrics provides analysis result within seconds and without a need for sample preparation. A library of continuously evolving AI models offers a solution that continuously evolves over time and can be tailored to customer's special needs. The Breeze-L™ allows for wireless communication to any smartphone via a Bluetooth interface. The phone app also allows users to setup their own databases for sample analysis. With the corresponding molecular signatures acquired by the miniaturized device, data can be wirelessly transferred to a smartphone via Bluetooth interface allowing for fast, reliable, and efficient implementation of this chemical analyzer.

## About BaySpec

BaySpec, Inc., founded in 1999 with 100% manufacturing in USA, is a Silicon Valley-based spectral sensing company. BaySpec designs, manufactures, and markets advanced spectral instruments, including smart handheld spectrometers, Raman spectrometers, a new class of OCI™ hyperspectral imagers, novel transportable mass spectrometers, high performance UVVIS-NIR-SWIR spectrometers, and OEM spectral engines and components, for precision agriculture, R&D, biomedical, pharmaceuticals, chemicals, food, semiconductors, health monitoring, and the optical telecommunications industry.