



June 2022

EPIC Online Technology Meeting on Plastic Sorting,
Recycling and Waste Management

FIRST LIGHT IMAGING *Group*

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Plastic Sorting, Recycling and Waste
Management
from a camera manufacturer perspective

First Light Imaging: Mission & Skills

Our mission

First Light Imaging offers advanced imaging solutions for extremely low light environment and real time applications to scientific and industrial communities.

Our skills

High speed and low noise at the same time

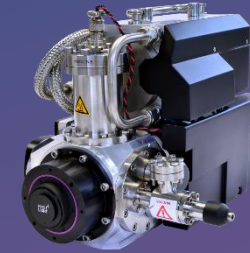


First Light Imaging: Camera Portfolio

OCAM & C-BLUE



Visible spectrum
(400 - 750 nm)



C-RED One

Increasing wavelength (μm) \rightarrow



SWIR spectrum
(900 - 2500 nm)

C-RED

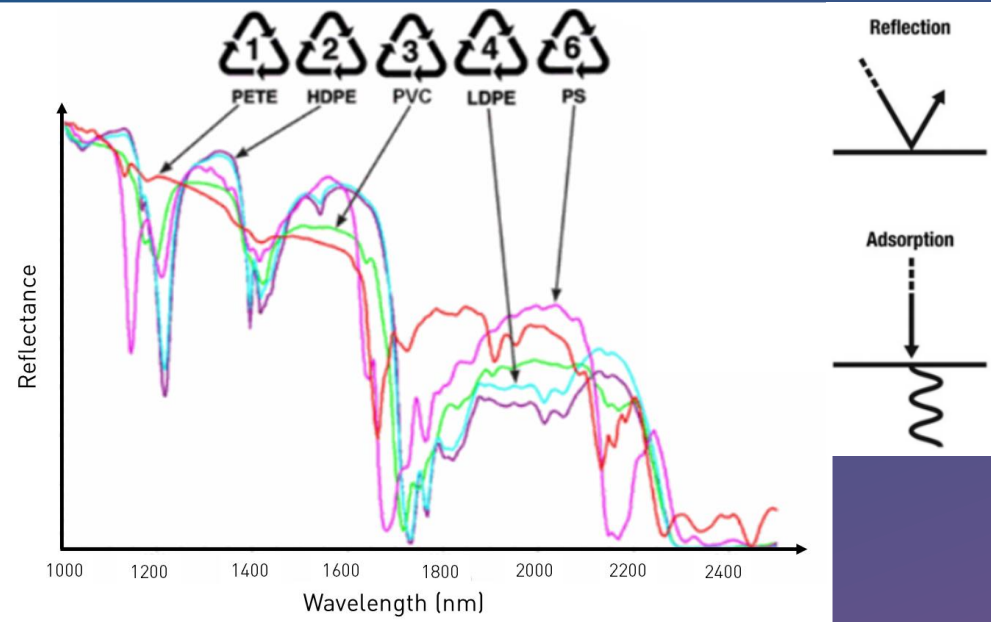


600 FPS FF



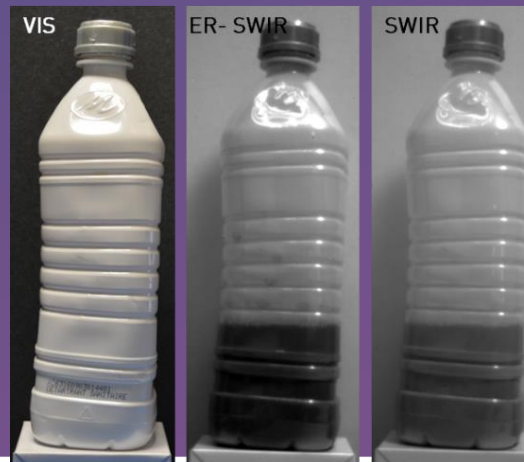
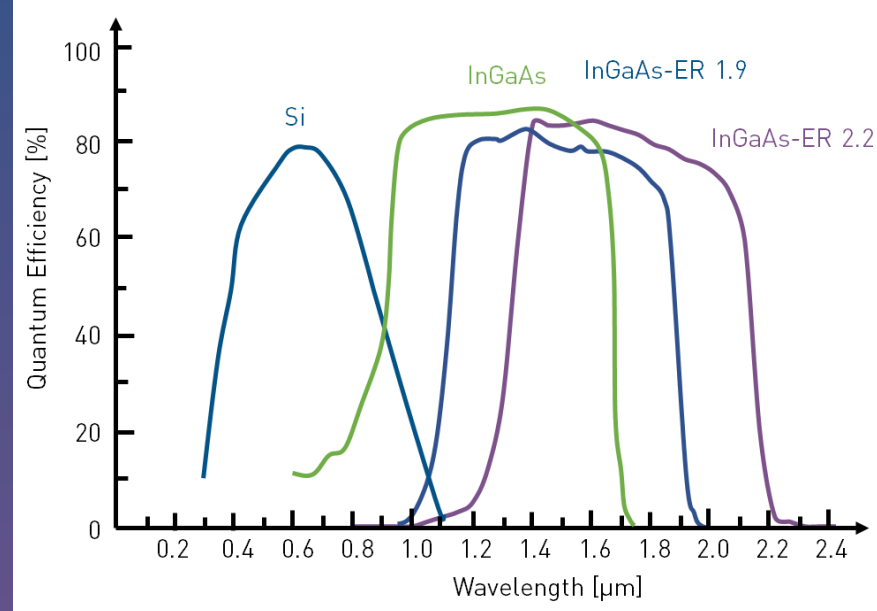
Wavelength matters

Use case

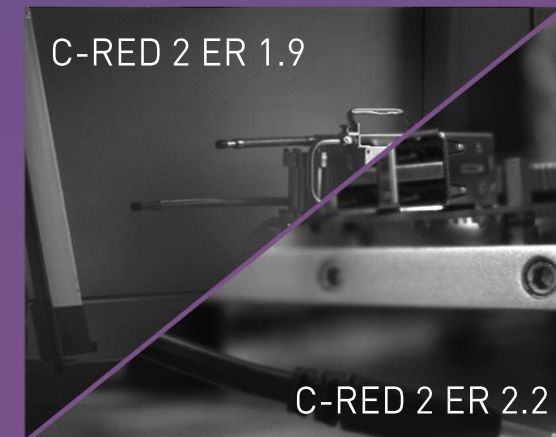


- ✓ Visible (400 – 900 nm) is reflecting the apparent colors of plastics
- ✓ In the SWIR (900 – 2500 μm), plastics have unique spectral features

Sensor quantum efficiency



Embedded on-the-fly corrections

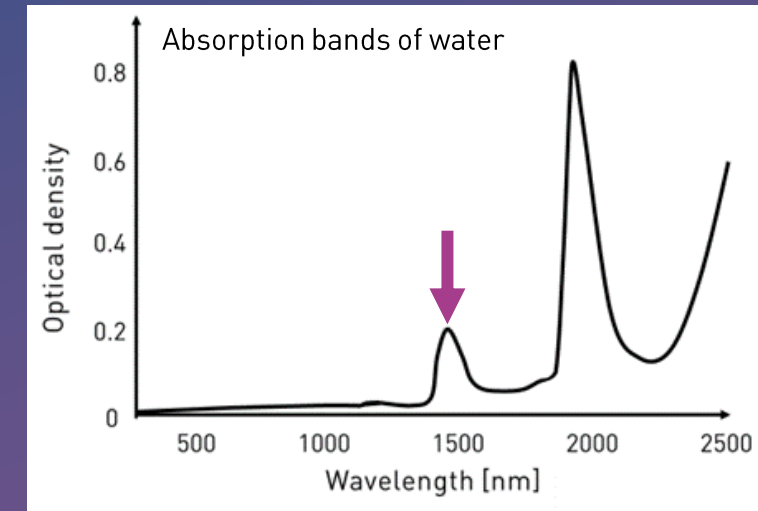


Use case 1/2 : Multispectral Imaging



Portable multispectral device

Camera	Model	C-RED 3
	Detector	InGaAs
	Pixel pitch	15 μ m
	Control interface	USB 3
	Region Of Interest (ROI)	Yes
	ADC resolution	14 bits
System	Aperture	F/ 1.4
	Dimensions	172 x 172 x 150 mm
Spectral performances	Spectral range	900 – 1700 nm
	Spectral bands	8
	Spectral sampling	tunable
Spatial performances	Resolution	640 x 512 pixels
	Objective lens	35 mm
	Field of view (vertical)	20°

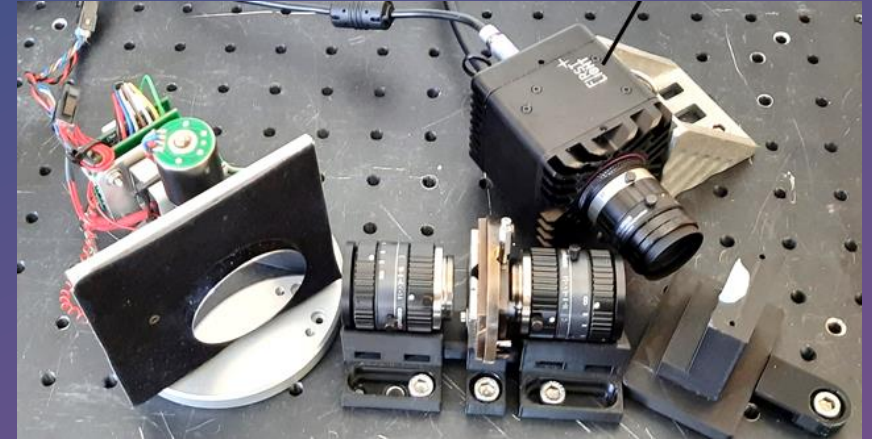
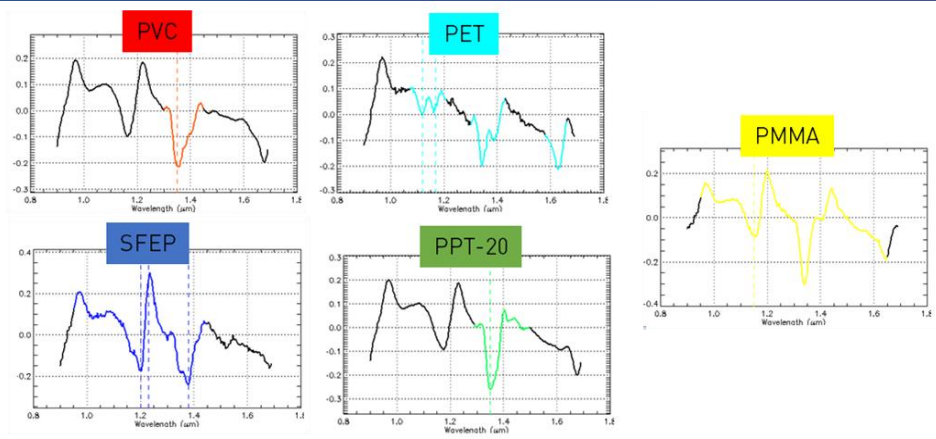
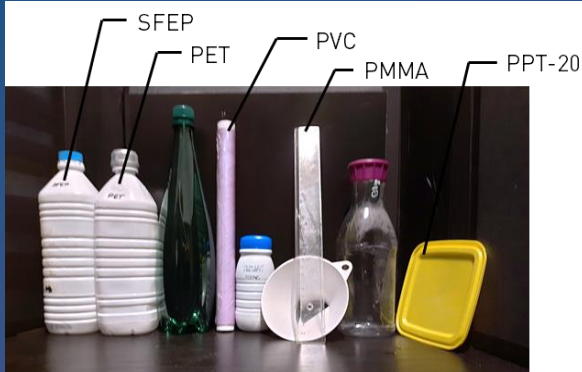


When spectral features are clearly identified, automated multispectral imaging is a cost-effective solution.



Study of the spectral features to detect humidity

Use case 2/2 : High speed Hyperspectral Imaging



Bench-top hyperspectral device

Camera	Model	C-RED 3
	Detector	InGaAs
	Resolution	640 x 512 pixels
	Pixel pitch	15 μ m
	Control interface	USB 3
	Region Of Interest (ROI)	Yes
	ADC resolution	14 bits
System	Aperture	F/ 1.4
	Dimensions	160 x 120 mm
	Speed (230 bands)	1200 fps
	Speed (4 bands)	24 000 fps
Spectral performances	Spectral range	900 – 1700 nm
	Spectral bands	230
	Spectral sampling	3.4 nm
Spatial performances	Resolution	640 pixels
	Field of view (vertical)	20°
	Field of view (horizontal)	Up to 35°

High speed identification made possible par high speed cameras : 1 HSI cube /s

→ Next step : couple the camera to a waste sorting machine



Conclusion

- *What can we do for you ?*

Offer a complete portfolio of SWIR cameras and a versatile software solution
Assure optimal high sensitivity and high speed
Provide know-how in camera integration for spectral applications

- *What can others do for us ?*

You are the integrators or end-users of our cameras
→ Provide feedback on your needs
→ Help us define the optimal camera for sorting
→ Perform tests with our cameras for new applications

Please contact us to work together !
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www.first-light-imaging.com

[FLI YouTube channel](#)

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