



EPIC Online Technology Meeting on Photonics for Woodworking

HYPERSPECTRAL IMAGING FOR FORESTRY MAPPING



SPECIM TODAY

HEAD OFFICE
OULU, FINLAND

FOUNDED IN **1995**

SPECTROGRAPHS
+
SPECTRAL CAMERAS

> 9 000
DELIVERED

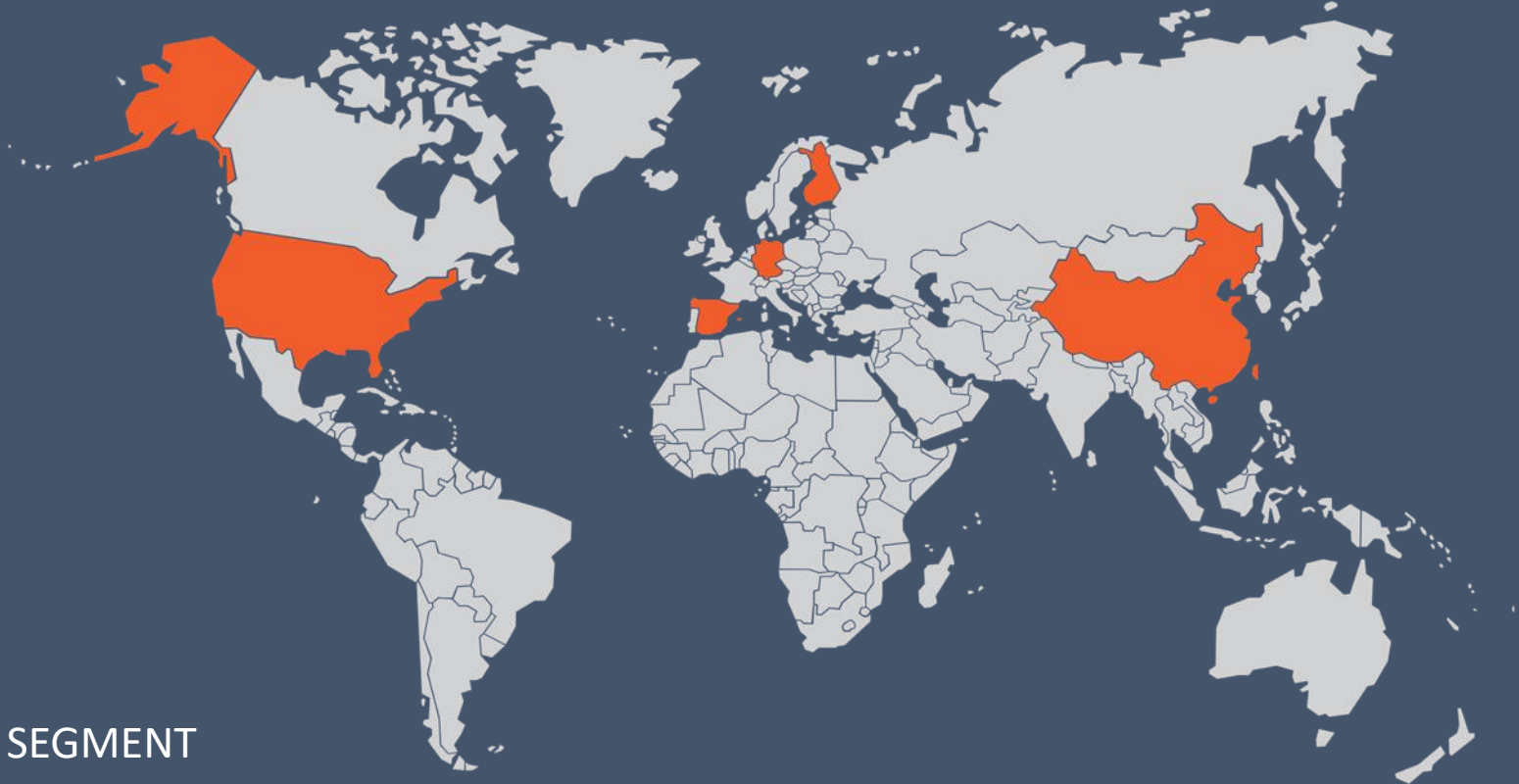


PERSONNEL CIRCA **80**

40% CAGR IN INDUSTRIAL SEGMENT

PART OF
KONICA MINOLTA

SINCE 2020

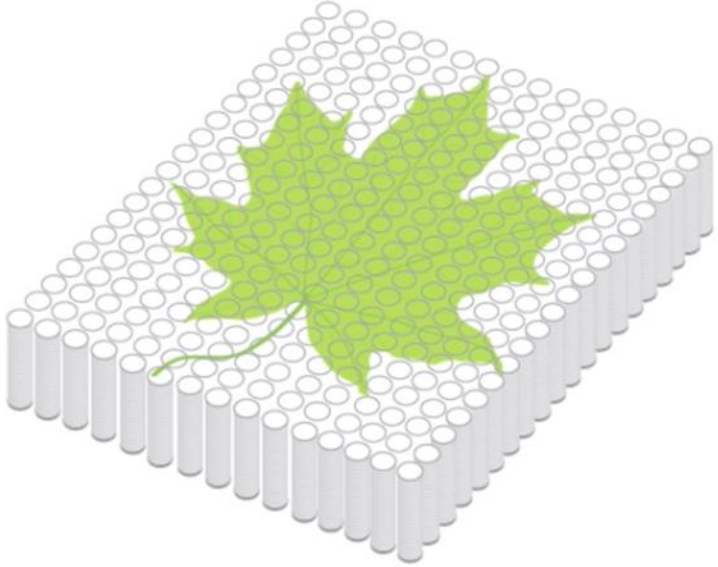


SPECIM LOCATIONS
BARCELONA, MUNICH, NEW JERSEY, SHANGHAI
+ WORLDWIDE DISTRIBUTOR NETWORK

The image features a white background with decorative geometric shapes in the corners. The top-right corner has overlapping orange and yellow polygons. The bottom-left corner has overlapping blue, purple, and green polygons. The text is centered in the middle of the page.

WHAT IS HYPERSPECTRAL IMAGING ?

















WHAT IS HYPERSPECTRAL IMAGING ?





PRODUCTS

PRODUCT RANGE

	VNIR 400– 1 000 nm	NIR/SWIR 900 – 2 500 nm	MWIR 3 000 – 5 000 nm	LWIR 8 000 – 12 500 nm
TYPICAL APPLICATIONS	Colour, Fruit & Veg, Skin & Tissue, Plants, Film, Water	Sorting, Recycling, Chemical Waste, Pharma, Quality	Black Plastic, Surfaces, Minerals, Detection	Mining, Detection, Gas, Geothermal
IQ SERIES	SPECIM IQ 			
FX SERIES	FX10 	FX17 	FX50 	
AFX SERIES	AFX10 	AFX17 		
SISU SERIES	SisuCHEMA  SisuROCK  SisuSCS 			
SPECTRAL CAMERAS	PFD4K-65-V10E  sCMOS-50-V10E  FENIX 	SWIR 		OWL  LWIR-HS 

SPECTRAL IMAGING PLATFORM

SPECIMONE



SpecimONE spectral imaging platform revolutionizes hyperspectral technology adaptation to industrial sorting applications.

AIRBORNE SYSTEMS



SPECIM

EPIC
European Photonics
Industry Consortium

Ready to be installed and operated onboard manned or unmanned airborne platforms with support for various GNSS/IMU sensors, data acquisition, power units, and software solutions for data acquisition and pre-processing.

AIRBORNE SYSTEMS



Specim AFX10

- Compact all-in-one hyperspectral imaging solution for UAS use
- 400 - 1000 nm (VNIR)



Specim AFX17

- Compact all-in-one hyperspectral imaging solution for UAS use
- 900 – 1700 nm (NIR)



Fenix

- Geology, environment, law enforcement
- 380-2500 nm (VNIR, NIR, SWIR)



APPLICATIONS

An aerial photograph of a forested landscape. A river flows through the center, with a dam structure visible. The forest is dense and green, with some areas appearing lighter, possibly due to different tree species or canopy density. The river is a light brown color, and the surrounding terrain is a mix of green and brown.

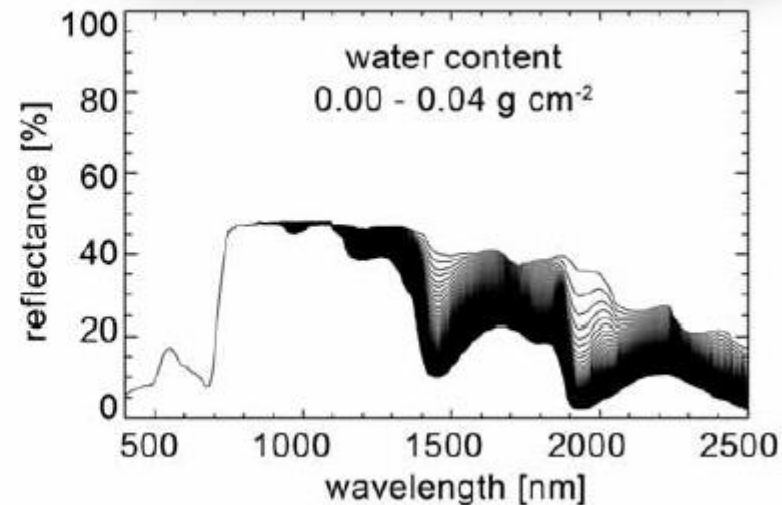
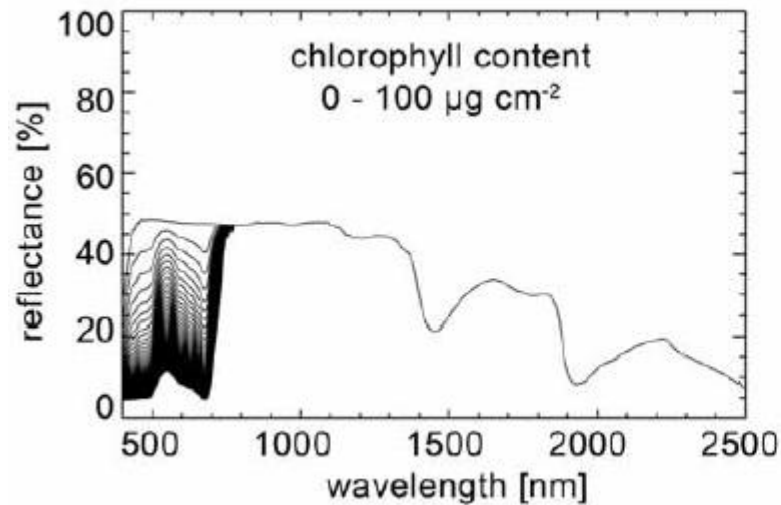
FORESTRY MANAGEMENT

Hyperspectral imaging offers advanced tools for forestry care or and monitoring.

PLANT SPECTROSCOPY

Chlorophyll, carotenoids, water and cellulose are the main parameters that determine plant spectral reflectance.

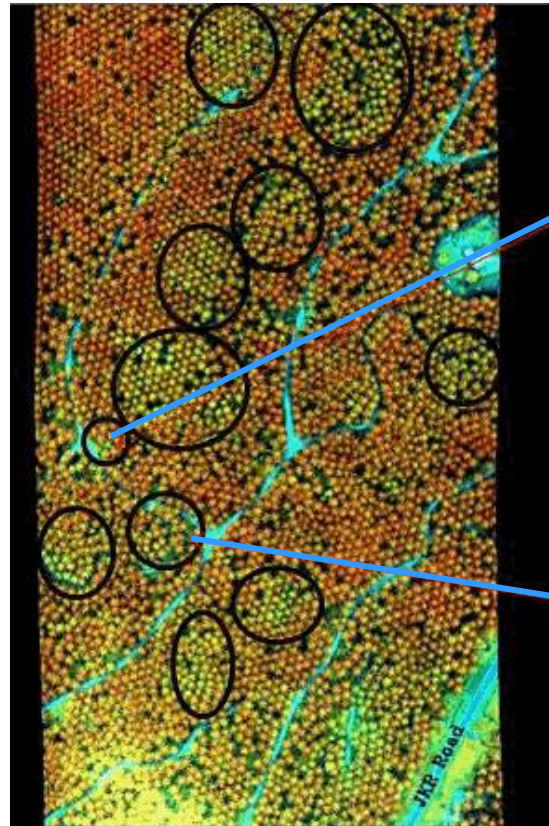
Flavonoids and anthocyanins are important coloring agents.



VEGETATION HEALTH MAPPING

Airborne HSI in VNIR provides sensitive and high resolution detection and mapping of a **fungus disease in oil palm trees**

>50 km²/h
@0.5 m ground resolution
@50 m/s (100 knots)



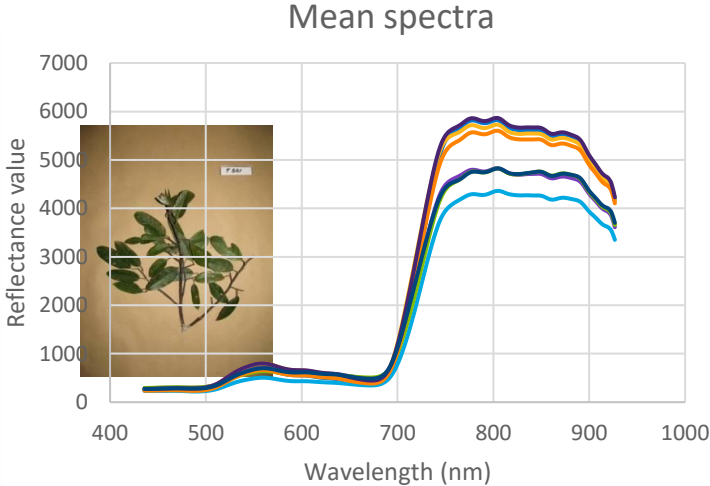
Sarawak Forest Department, Malaysia



SPECTRAL SIGNATURES OF TREE SPECIES



Specim AFX10

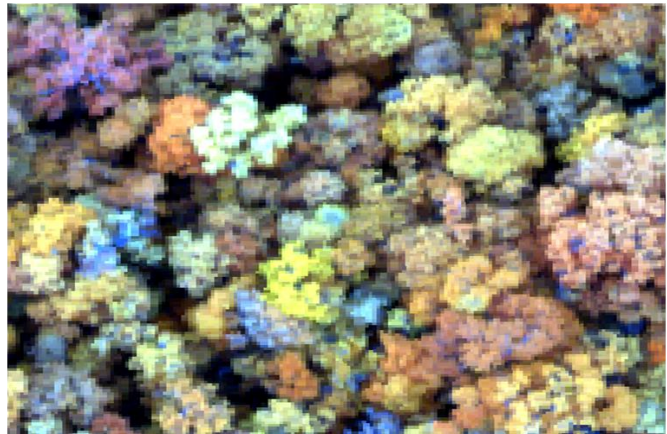


- D. globosus — D. aromatica — Shorea acuta
- S. beccariana — S. crassa — S. curtisii
- S. kunstleri — S. oval

SPECTRAL SIGNATURES OF TREE SPECIES



Specim AFX10



Targeted
Classification →



Shorea kunstleri (Red Selangan)
Overall accuracy classification: 85%

FOREST INVENTORY AND HEALTH

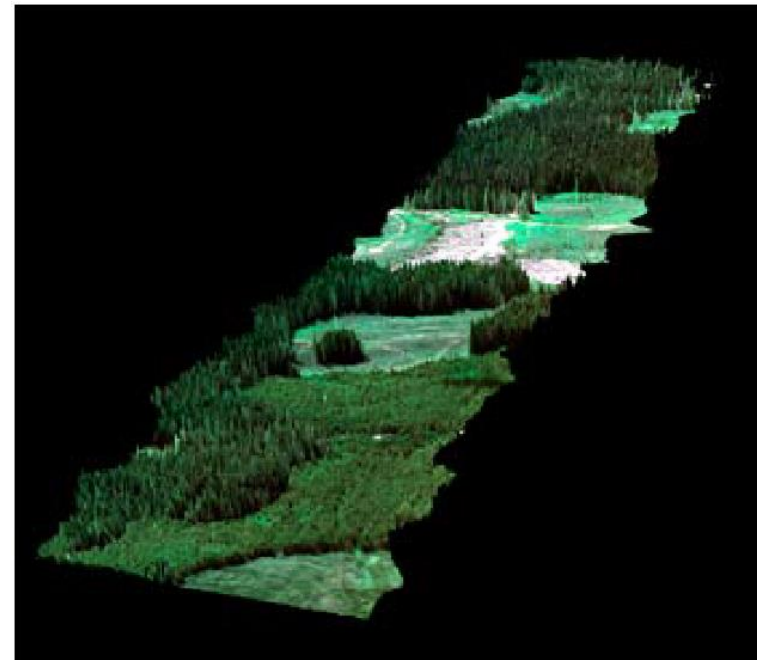


Specim AFX10



Specim AFX17

- Fusion of hyperspectral imaging and Lidar data
- Tree height and volume
- Species identification and distribution
- Tree health condition



University of Victoria, Canada



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SPECIM



A Konica Minolta Company

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