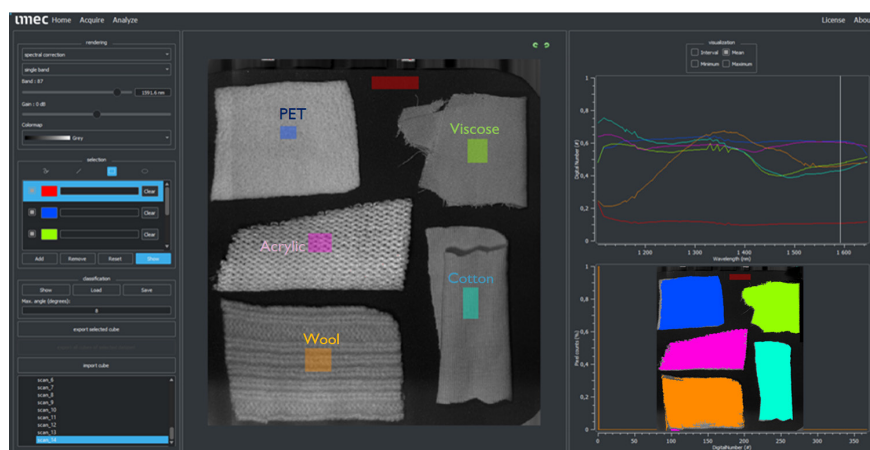# Snapscan SWIR hyperspectral imaging camera

Imec's snapscan SWIR high resolution hyperspectral camera is a major breakthrough for hyperspectral imaging application research. Within a few seconds, high quality hypercube data is created with high signal-to-noise ratio and unmatched spatial and spectral resolution. The snapscan kit enables application research of the highest quality, while still being user friendly by not requiring any external scanning system. It integrates all key components required: the spectral image sensor and imec's advanced hyperspectral imaging software: HSI Snapscan.

High resolution hyperspectral imaging in the short-wave infrared spectrum

The user friendliness is the key benefit of the Snapscan SWIR camera. It enables users to quickly generate high-resolution hyperspectral images of stationnary objects either in the lab or outside the lab.

Key benefits

- **No translating stage/belt required** with integrated scanning mechanism directly inside the camera to generate a hyperspectral image in a matter of seconds

- **Highest spatial** (up to 0.8Mpx) & **spectral** (100 bands) **resolutions**

- **Highest SNR** ever reached with imec on-chip filter technology thanks to high-performance backside illuminated InGaAs sensor and advanced software features for cube reconstruction and spectral correction
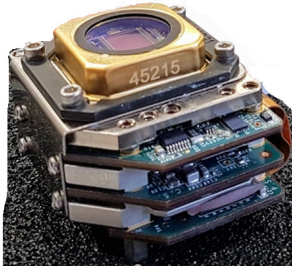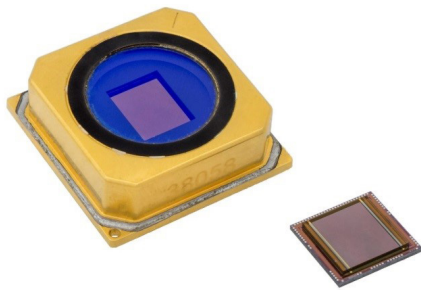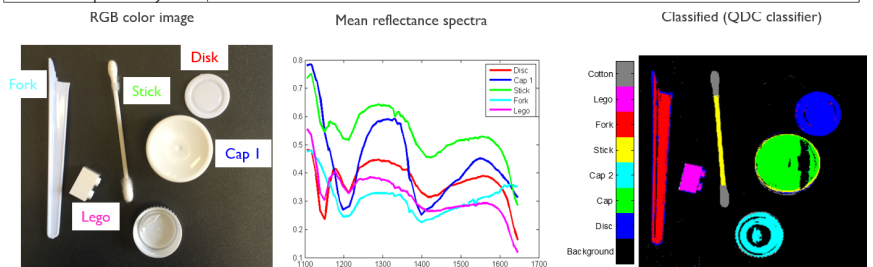

Hyperspectral imaging in SWIR range using imec's SNAPSCAN camera with 100+ bands in 1.1 – 1.7um range enables robust classification of various type of different black color textiles.

SWIR Linescan hyperspectral image sensors integrated into the Snapscan camera system

Snapscan SWIR system product specification

| Spatial resolution	up to 1200 x 640 px (0.8MP RAW per band)
Spectral resolution	100 bands (SWIR version)
Spectral range	1100-1650 nm (SWIR version)
FWHM	~ 10 – 15 nm (collimated)
Acquisition speed	2 to 10 seconds, depending on acquisition parameters, lighting and object
SNR	up to 600:1
Software	HSI SNAPSCAN software for raw image acquisition, data pre-processing, hypercube visualization and classification; C and Python API for acquisition and data pre-processing in custom software
SW scanning modes	Digital TDI (x5-8 stages max) Multi-exposures Digital binning (2x2, 3x3, 4x4) Spectral ROI - Region of Interest Spatial ROI - Region of Interest
Dynamic range	13 bits
Optics	Standard C-mount; 16/25/35/50 mm lenses available
Smile & keystone	Software-corrected
Interface	USB3.0 + GPIO for triggering (TTL)
Cooling	Passive & active cooling (fan based + TEC)
Ambient operating	15°C to 45°C (operation), 5°C to 50°C (transport)
Mechanical	Integrated mechanical shutter for automatic dark-counts, Tripod mount (¼"-20) + side mounting M5 holes
Dimensions (LxWxH)	9 x 9 x 15 cm
Weight	895g (without optics)
Hyperspectral software compatibility	Output in standard ENVI hyperspectral data format

Hyperspectral imaging in SWIR range using imec's SNAPSCAN camera with 100+ bands in 1.1 – 1.7um range enables robust classification of various type of different white color plastics

Research applications

- Recycling & waste management (paper, wood, plastic, textile, etc...)
- Food quality grading, defect inspection and sorting
- Skin imaging & cosmetic research
- Medical guided surgery
- Agriculture
- Mineral & material characterization
- General purpose research for Indoor or outdoor environment
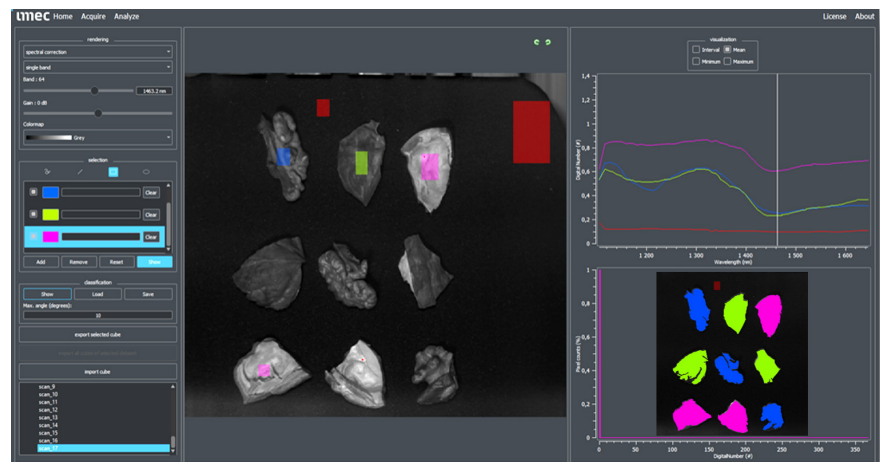
Hyperspectral imaging in SWIR range using imec's SNAPSCAN camera with 100+ bands in 1.1 – 1.7um range enables robust classification of nuts versus their nut's shells