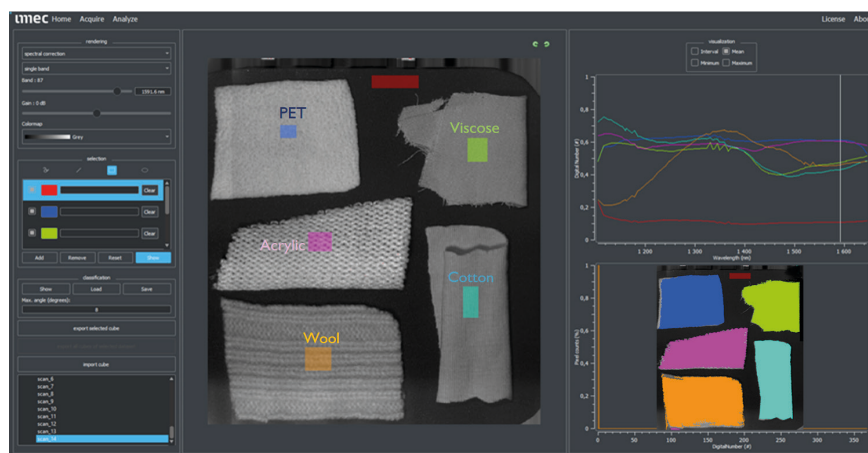# SNAPSCAN SWIR RANGE HYPERSPECTRAL IMAGING CAMERA

Imec's snapscan system is a major breakthrough for hyperspectral imaging application research. Within as little as a few hundred's of milliseconds, high quality hypercube data-sets are created with unmatched signal-to-noise ratio and spatial and spectral resolution. The snapscan demo kit enables application research of the highest quality, while still being user-friendly. It integrates all key components required: the spectral image sensor, camera, optics, piezo scanning, active cooling system, lighting, tripod mounts and imec's most advanced hyperspectral imaging software: snapscan software, an advanced hyperspectral imaging software developed by the imec team.

SNAPSCAN HYPERSPECTRAL IMAGING FOR REAL-WORLD APPLICATIONS

After years of research and development, imec now combines the best of its system-level hardware and software expertise in the snapscan: one unique system platform (patent pending) combining the high SNR, spatial and spectral resolution of linescan imaging camera with the fast and convenient way that snapshot HSI cameras acquire hypercube data-sets.
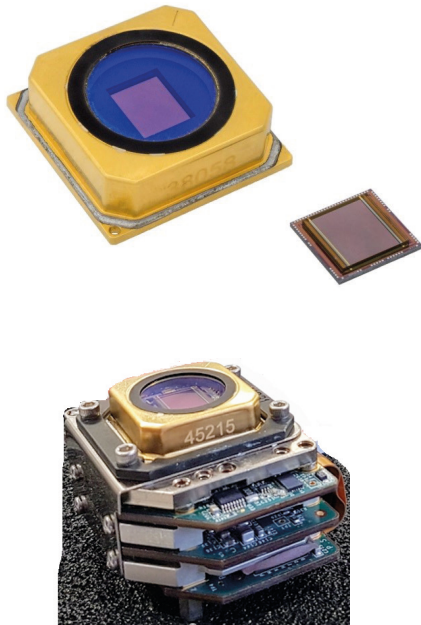

Hyperspectral imaging in SWIR range using imec's SNAPSCAN camera with 100+ bands in 1.1 – 1.7um range enables robust classification of various type of different black color textiles.

KEY BENEFITS

- **Snapshot acquisition** made easy and user-friendly with integrated ultrasonic scanning mechanism directly inside the camera to reach sub-second acquisition times

- **Highest spatial** (up to 0.8Mpx) & **spectral** (100+bands) **resolutions** possible for snapshot-based hyperspectral imaging in a compact, lightweight and mass-manufacturable design

- **Highest SNR** ever reached with imec on-chip filter technology thanks to active cooling and advanced software features for cube reconstruction and spectral correction

SNAPSCAN SWIR SYSTEM PRODUCT SPECIFICATION

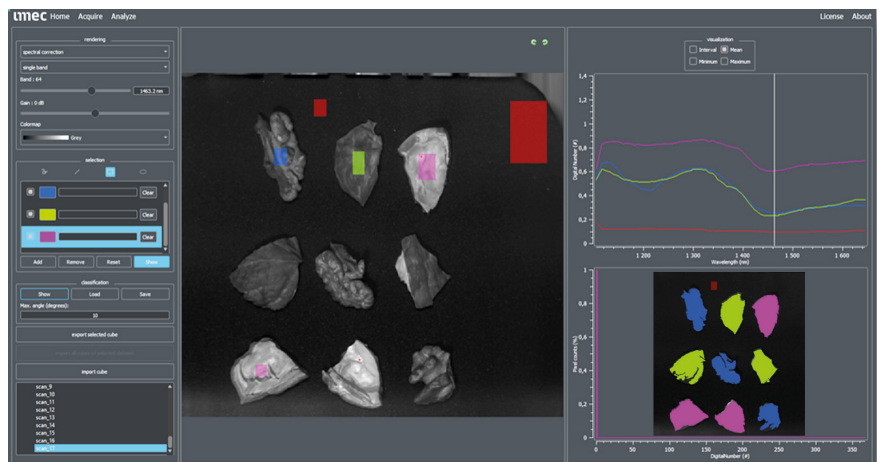|	
Spatial resolution	up to 1200 x 640 px (0.8MP RAW per band)
Spectral resolution	100+ bands (SWIR version)
Spectral range	1100-1650 nm (SWIR version)
FWHM	~ 10 – 15 nm (collimated)
Acquisition speed	~ 100ms - 10 seconds, depending on acquisition parameters, lighting and object)
SNR	up to 600:1
SW scanning modes	Digital TDI (x4 - 8 stages max) Multi-exposures (1-40) HDR exposures (1 - 10) Digital binning (2x2, 3x3, 4x4) Spectral ROI - Region of Interest Spatial ROI - Region of Interest
Dynamic range	12/13 bits (higher possible with HDR SW scanning mode)
Optics	35 mm lenses – F2.0 – C-mount
Smile & keystone	Software corrected
Interface	USB3.0 + GPIO + I/O for triggering
Cooling	Passive & active cooling (fan based + TEC)
Ambient operating emperature	-5ºC – 50ºC (-20ºC-60ºC storage)
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)
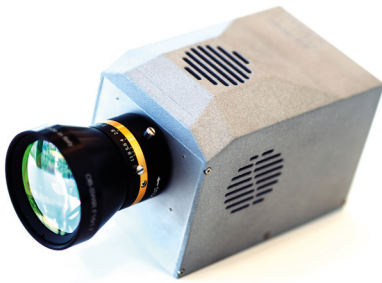
SWIR Linescan hyperspectral image sensors integrated into the snapscan camera system
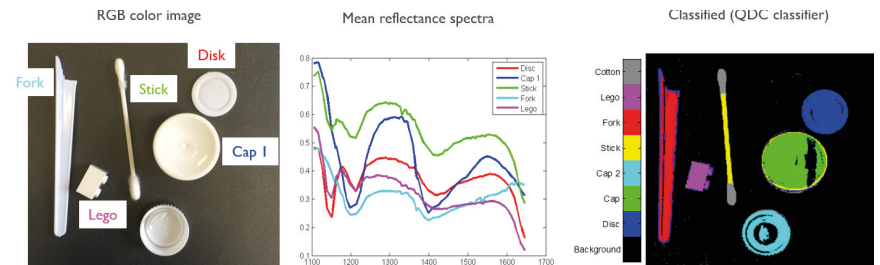
RGB color image   Mean reflectance spectra   Classified (QDC classifier)

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

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

APPLICATIONS

- Recycling & waste management (paper, wood, plastic, textile, etc...)
- Food quality grading, defect inspection and sorting
- Skin imaging & cosmetic research
- Medical guided surgery
- Agriculture & robotics
- Industrial machine vision
- Mineral & material characterization
- General application research for hyperspectral imaging in both lab and outdoor environments

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