LLA instruments

SCAN • SORT • SUSTAIN

Plastic Sorting

Hyperspectral sorting systems for waste recycling and recovery

Household waste

PET flakes

WEEE

PCB

LLA instruments

SCAN • SORT • SUSTAIN

Maximise plastic recycling efficiency with hyperspectral precision imaging

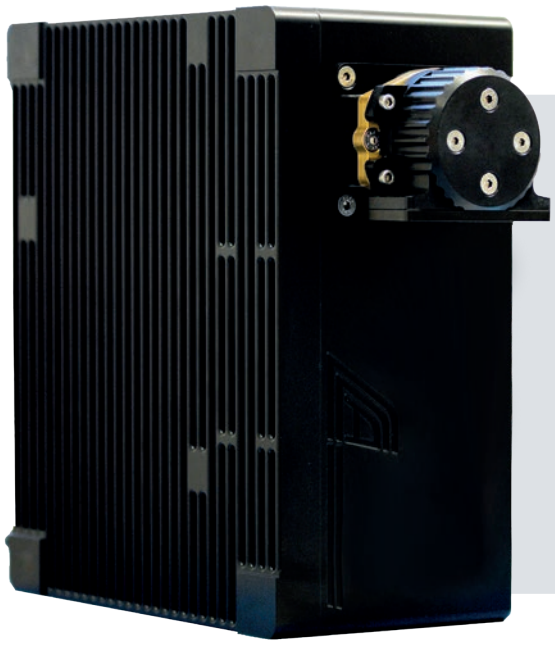
We generate around 400 trillion tons of plastic every year. Less than 10% is being recycled, leaving billions in lost value and substantial quantities in landfills, oceans and environment.

70% of waste plastic can be recovered economically if sorted properly, and millions can be saved. But due to inaccuracy and inefficiency in the current sorting systems, we don't realise how much of that money could be recovered.

KUSTA NIR/SWIR hyperspectral sorting systems...

Our push-broom technology enables real time material analysis, achieving higher rates of accuracy due to the high resolution our cameras provide.

Most plastic waste like packaging, plastic bottles, and household waste, can be sorted and recycled again - further saving you money!



Our core technology:

KUSTA

Hyperspectral Camera

- Distortion-free lens for high spectral and spatial resolution
- High frame rates, with small particle detection up to 3 m/s speeds
- Detects inhomogeneities for accurate sorting

LLA Instruments SWIR sensor solutions are easily integrated into plastic sorting machines

KUSTA-System

Hyperspectral Process Systems

Advantages

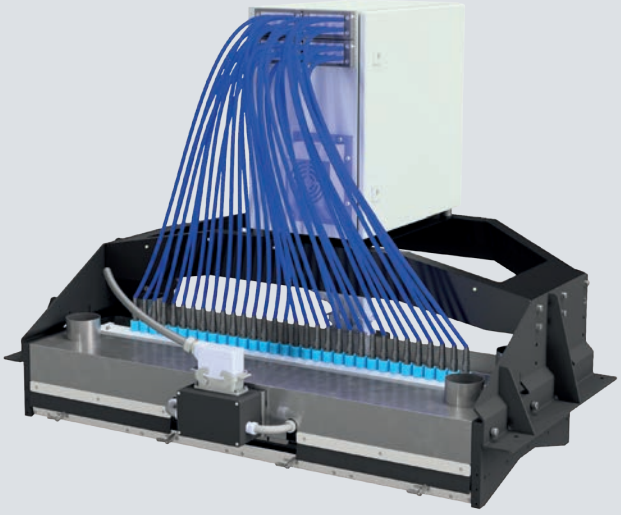
- Fast, real-time results with up to 800 Hz throughput
- Distortion-free VIS/NIR/SWIR technology
- TE-cooled InGaAs for high sensitivity
- Customisable to your needs
- Optional RGB camera for increased accuracy
- Resistant to water, dust, and dirt

Spectral Ranges / Number of Tracks

KUSTA-System 0.9:	0.35 - 0.95 µm / 1920
KUSTA-System 1.7:	0.95 - 1.70 µm / 320
KUSTA-System 1.9:	1.32 - 1.90 µm / 192
KUSTA-System 2.2:	1.62 - 2.19 µm / 192

Key Specifications:

Spectral Resolution:	< 8 nm
Protection Class:	IP67
Particle Size:	< 2 mm
Process Interface:	TCP/IP or UDP protocol
Connections:	Push-Pull plugs, 1 Gb Ethernet



KUSTA-MPL

Multiplexed NIR Spectrometer

Advantages

- Scalable, high-resolution NIR spectrometer with fibre optic for non-contact detection
- TE-cooled InGaAs for high sensitivity
- Fast scan rate up to 70 Hz
- Works at belt speeds up to 3 m/s
- Detects small spectral differences and particles > 30 mm
- Detects similar plastics eg. ABS and PS

Spectral Ranges

KUSTA-MPL 1.9:	1.36 - 1.94 µm
KUSTA-MPL 2.2:	1.10 - 2.2 µm

Key Specifications:

Spectral Resolution:	< 8 nm
Scan Rate:	30 Hz - 70 Hz
Particle Size:	> 30 mm
Number of Tracks:	up to 64
Power Supply:	24V DC / 20A
Operating Temp:	+5°C to +45°C
Weight:	31 kg

Identification of plastics in real-time with specialised analytical software

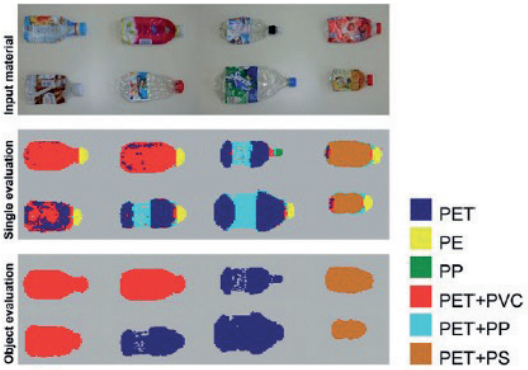
Software Modules for identifying plastics

idHwaste

Identification of plastics in household waste

The software module **idHwaste** is optimally calibrated to household materials and requirements. It not only identifies all plastics from which food packaging is made but also frequently occurring technical polymers such as polyamide (PA).

- **Identify plastics:**
  PET, PE, PP, PS, PVC, PA, PE bottle / PE foil
- **Detect foreign matter:** paper, cardboard, wood, liquid packing board (TETRA), textiles
- **Identify mixed fractions:** PET bottles with PE, PP or PVC labels (for Bottle-to-Bottle recycling)
- **Optional modules:** HDPE/LDPE, PET/PETG, paper/wood, foil identification, colour identification

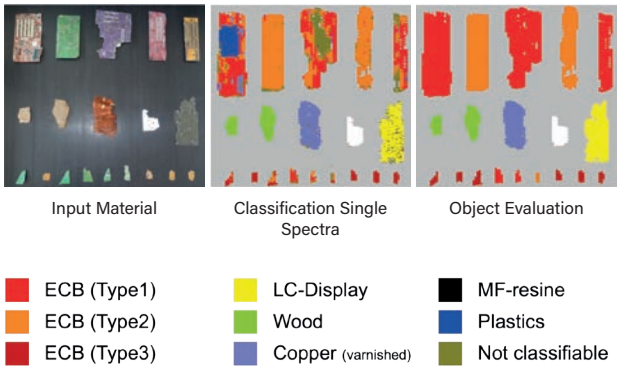


idPCB

Identification/sorting of printed circuit boards

The **idPCB** module identifies all technical plastics used in consumer or household electronics. It also identifies various types of electronic printed circuit boards (PCBs), from which high-value raw materials (precious metals) can be recovered after sorting.

- **Identify PCB:**
  Phenol- and Epoxide resin saturated PCB
- **Identify plastics:** ABS, PS, PA, PBT, PC, PE, PP, PET, PVC, PMMA, PUR, POM
- **Identify blends:** PPE+SB
- **Detect foreign matter:** silicone, melamine-formaldehyde resin (MF), LCDs

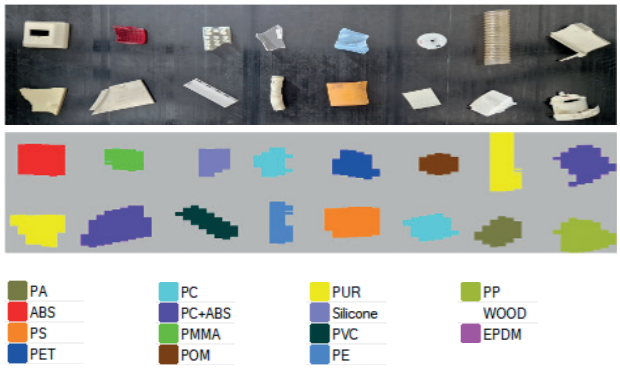


idEwaste

Identification of plastics in WEEE recycling

idEwaste software module contains all technically relevant plastics and blends for determining the chemical composition and plastic fractions, for the processing of technical plastics, or waste electrical and electronic equipment (WEEE).

- **Identify plastics:** ABS, PS, PA, PBT, PC, PE, PP, PET, PVC, PMMA, PUR, POM
- **Identify blends:** PC+ABS, PPE+SB, PVC+ABS, ABS+TBBPA, ABS+TBBPAep, PS+TBBPA, PS+TBBPEep
- **Detect foreign matter:** paper, cardboard, wood
- **Optional modules:** HDPE/LDPE, EPDM, paper/wood, colour identification

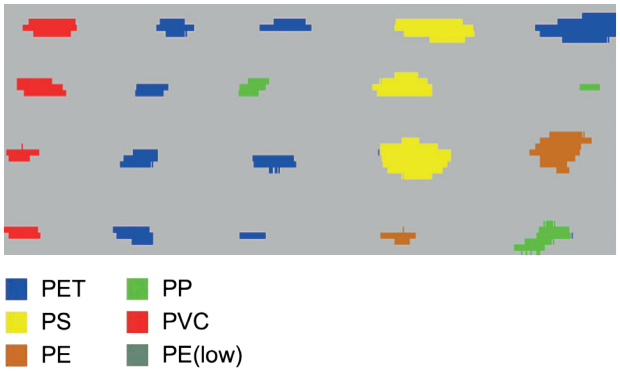


idPET Flakes

Identification/sorting of PET flakes

The **idPET Flakes** software module is used to eliminate interfering substances in bottle-to-bottle recycling of PET bottles. In addition to all common household plastics, it also identifies interfering substances such as PA or silicone, the latter of which is often found in the seals of the bottle caps. After sorting with idPET Flakes, you have a largely PVC-free recyclable material available to you.

- **Identify plastics:**
  PS, PA, PC, PE, PP, PET, PVC, PMMA
- **Identify mixed fractions:** PET+PVC
- **Detect impurities:** silicone



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LLA instruments

scan

with hyperspectral and x-ray fluorescence technology for precise material analysis

sort

with optical sensor-based systems for fast, high-throughput processing

sustain

with flexible software programmes to adapt to new material demands

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