SESOTEC

Recycling

SORTING SYSTEMS

FLAKE PURIFIER Family

Multi-sensor sorting systems for the recycling of plastic flakes and regrind

Reliable sorting of plastic flakes and regrind

The user-friendly PURIFIER PERFORMER efficiently, precisely, and profitably detects and sorts plastic flakes and regrind by plastic type, color, and metallic contaminants. Thanks to high throughput, minimal loss of good material and high user availability, the PURIFIER PERFORMER is exceptionally profitable.

Flexible

- Freedom to choose the sensor configuration depending on the application
- Available with or without connection set
- Two or more sorting stages possible on one device

Individual

- Various preset sorting programs – manually adjustable by the operator on-site
- Customizable color settings
- Adaptable plastic library

Sustainable

- Sensors can be retrofitted at any time
- Includes software upgrades

Areas of application

The application areas of the FLAKE PURIFIER family are versatile. The devices reliably sort a variety of materials at high throughput rates with maximum efficiency and minimal loss of good material.

PET Flakes

Oxygen- / UV-Blocker Flakes

HDPE Flakes

PE / PP Regrind

Three steps to your flexible sorting system

System configuration

- Working width
- Sensor combination
- Integrated resort track
- VISUDESK-visualization software

Flexible service package

- On-site commissioning
- Optional on-site or remote
- Support optimization
- Warranty packages

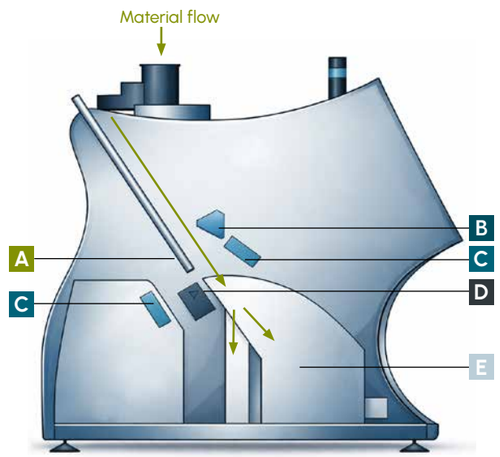
Higher profitability

Optional connection set: Planning and integration into the recycling line

For seamless integration of our sorting systems into your facility, we optionally offer a perfectly coordinated set. This includes a feed hopper, level sensors with speed control for the vibrating conveyors, as well as the corresponding steel construction and suitable discharge chutes.

The system has the following components

- **A** Metal sensor: for detecting of smallest metal contaminants
- **B** NIR camera: for detecting various materials and combinations of materials
- **C** Color & shape sensor: for detecting objects and a variety of colors
- **D** Blow-out system: with various nozzles for time-accurate and position-accurate separation of foreign objects
- **E** Reject systems: optimized aerodynamic design for discharge of impurities



PURITY IS VALUE

Our solution to your challenges

Our FLAKE PURIFIER Family can be perfectly tailored to your needs through the flexible combination of sensors. It sorts plastic flakes efficiently and accurately, ensuring a high level of material purity. The multi-sensor sorting system reliably detects the smallest contaminants, resulting in only minimal loss of good material. For added sorting efficiency, you also have the option to equip your system with various features.

Your challenge

Ensuring purity is crucial for the quality of recycled plastic, especially in the context of producing food-grade recyclate. This is particularly true for processes such as bottle-to-bottle recycling, where the requirements are much more demanding than in conventional applications.

Our solution

Multi-sensor sorting systems offer the optimal solution to ensure:

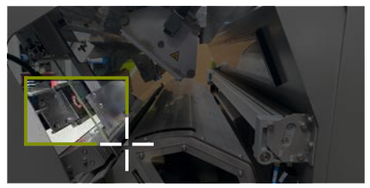
- High material purity to meet the highest quality requirements
- High material throughput for more profitability
- Minimal loss of good material for highest efficiency

THE MODE OF OPERATION OF THE FLAKE PURIFIER

Innovative sensors

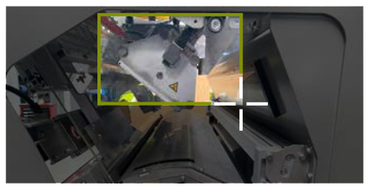
C **Color**

Color and shape recognition with the Sesotec C-Camera (Color) is performed by an independent camera systems. This allows the sensor to be optimally adjusted to the respective sorting task. Innovative LED lighting enables both economical and efficient sorting:In addition, the detection of white-opaque TiO2 flakes is also possible.



M **Metal**

The Sesotec M-sensor (Metal) reliably detects the smallest metal contaminants, regardless of their magnetic properties. All our experience from over 40 years of metal detection in various industries lies in this sensor. It stands for precision, robustness and reliability.



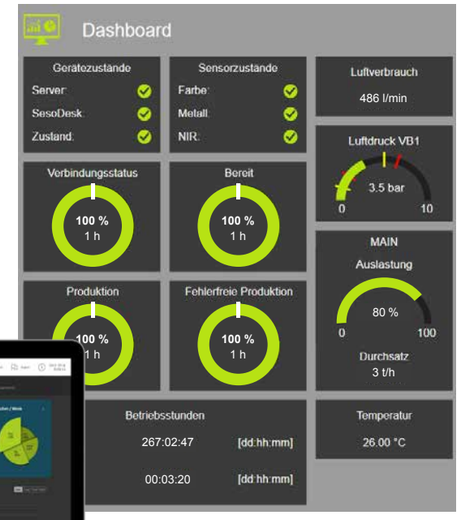
N **NIR**

The Sesotec NIR hyperspectral camera with halogen illumination is the proven solution for high-end applications such as bottle-to-bottle, tray-to-tray and other food-grade plastic sorting tasks. The high-precision sensor reliably and simultaneously detects a wide range of foreign plastics such as labels (PVC), caps (HDPE, PP) or even PET-like plastics (e.g. PET-G).

ADDITONAL OPTIONS FOR EVEN MORE EFFICIENCY

VISUDESK

To improve product quality and the efficiency of sorting and recycling plants, process data is essential for operators. With the VISUDESK visualization software, these can be easily and clearly displayed on all Sesotec devices. Based on this data, they can derive targeted measures to increase efficiency and effectiveness on the one hand and minimize down-time on the other. The OPC UA-based machine communication model is implemented both on the devices and on a communication server, enabling both stationary and mobile access to the application.



Dashboard visualization of process data, valve data, evaluation data and material data

Added Value through VISUDESK

- Control of the sorting process
- Optimization of the sorting plant
- Predictive maintenance
- Reduction of downtime
- Fact-based decisions

Recovery Option

Efficient material recovery

Via the additional separating unit, contaminated material is examined separately and returned to the material flow with a recovery rate of up to 98%.

1 **Main Input**
Contaminated input material

2 **Final Accept**
Purified end product

3 **First Stage Reject**
Heavily contaminated product:
Discarded foreign substances and off-colors

4 **Second Stage Accept**
Contaminated material:
Result of cleaning step 3 (First Stage Reject)

5 **Final Reject**
Final poor product

HIGHEST RPET QUALITY

Precise Flake Sorting and Material Analysis

Efficient PET recycling already starts with the initial sorting of whole packaging items. Modern object sorting systems – such as those used in the VARISORT+ family – create the foundation for high-quality material streams. However, it is only in the next process step that it becomes clear whether the sorted packaging actually results in high-quality recyclate. After shredding and washing, the resulting PET flakes must be precisely cleaned and their quality reliably verified. How this interaction between flake sorting and material analysis works in practice is demonstrated in the following case study of the Relling Group.

Challenge:

Ensuring Maximum Purity in PET Recycling

The Relling Group operates several PET recycling plants in Germany and processes large quantities of PET bottles into high-quality rPET. In order for the recycled material to be reused in demanding applications such as new PET bottles or polyester fibers, a very high purity of the flakes is required.

The recycling process includes numerous steps – from debaling the bottles to sorting and shredding, all the way to washing processes. Despite modern systems, ensuring product quality often requires time-consuming manual, visual or thermal sample analyses to identify foreign materials or incorrect colors. Recycling companies therefore face the challenge of ensuring material purity, process reliability, and efficient quality control at the same time.

Solution:

Flake Sorting and Material Analysis Working Together

FLAKE PURIFIER+ | Precise Flake Sorting
After shredding and washing, the PET flakes are processed through the FLAKE PURIFIER+ sorting system. The system reliably removes incorrect colors, foreign plastics, and metals, while simultaneously ensuring precise sorting by polymer type – all in a single process step.

FLAKE SCAN | Fast Material analysis
Complementing the sorting process, the FLAKE SCAN material analysis system enables precise analysis of material composition within minutes. Samples from big bags or silos can be quickly examined for foreign materials, incorrect colors, or metals.

RESULT

Achieving Maximum Purity of PET Flakes

"We had the opportunity to test FLAKE SCAN shortly after its market launch and were convinced of its benefits after extensive trials. The FLAKE SCAN analysis system from Sesotec delivers precise, automated and, above all, reproducible results in a significantly shorter time when analyzing material samples. The analysis system relieves the workload of the laboratory. This saves time and, of course, also additional costs in this area."

Dr. Hanns-Jörg Bentele, Managing Director of Reiling Kunststoffrecycling GmbH

Learn more here:

Honors to our customer

Reiling Unternehmensgruppe

MATERIAL QUALITY THROUGH SORTING AND ANALYSIS SYSTEMS

The Perfect Combination for Maximum Material Quality

High-quality recyclate requires two key factors: precise sorting and continuous quality monitoring. The combination of a PURIFIER sorting system with the FLAKE SCAN analysis system creates an optimally coordinated solution for modern recycling plants. While the PURIFIER systems perform high-end sorting of plastic flakes, FLAKE SCAN ensures full transparency and quality control throughout the entire recycling process.

PURIFIER SYSTEMS

The sorting systems of the PURIFIER family reliably separate plastic flakes according to material type, color and metallic contaminants. Thanks to the flexible combination of various sensors, they can be optimally adapted to the respective sorting task and material stream.

Key advantages:
- Multi-sensor technology for detecting plastic type, color and metals
- Hyperspectral NIR cameras for reliable identification of different polymers and foreign materials
- Metal sensors that detect even the smallest metal contaminants
- High throughput with minimal loss of good material
- Flexible configuration for different sorting stages and applications

With this technology, recyclers achieve very high purity levels of the sorted fractions while maintaining maximum process efficiency.

FLAKE SCAN

The FLAKE SCAN analysis system complements the sorting process by providing fast and reliable material analysis of plastic flakes and regrinds. Within minutes, samples can be analyzed using several integrated sensors for plastic types, colors and metal contaminants. This gives operators a detailed understanding of material composition and the performance of each sorting stage.

Typical applications:
- Incoming material inspection
- Process monitoring between sorting stages
- Final quality control of the recyclate

Together, PURIFIER systems and FLAKE SCAN form a closed-loop quality control system:

1

Incoming material inspection

FLAKE SCAN analyzes incoming material batches and determines composition, impurities and metal content.

2

Optimized sorting process

PURIFIER systems perform high-performance sorting based on state-of-the-art sensor technology.

3

Process monitoring

FLAKE SCAN evaluates material streams within the sorting process and enables targeted optimization of sorting parameters.

4

Final quality inspection

The processed recyclate is checked again using FLAKE SCAN to ensure the required purity levels are achieved.

The combination of sorting technology and material analysis ensures:

- Higher material purity
- Improved process stability
- Faster process optimization
- Reduced manual inspection effort
- Maximum confidence in recyclate quality

PURIFIER systems & FLAKE SCAN = the perfect combination for modern plastic recycling plants.

MULTI-SENSOR SORTING SYSTEM

FLAKE PURIFIER+

The high-end sorting system for flakes and regrind materials

Application for sorting flakes and regrind materials in plastic recycling

Free consultation
https://www.sesotec.com/contact

CMN	2	2–20 mm
Sensors	Working widths	Grain size

Efficient

- Very high material throughput of up to 3.8 t/h
- Option for integrated recovery of good material
- Later sensor upgrades possible

Precise

- Reliable detection and sorting by plastic types, colors, metals and foreign bodies with just one system
- Very high purity level of the sorting fractions up to 99.999%
- In contrast to low-end NIR technologies, hyperspectral technology enables the simultaneous identification and sorting of multiple foreign plastics.
- Minimal loss of good material

Profitable

- Best possible sorting results even with poor material quality
- High system availability due to low maintenance and cleaning effort
- Flexible system configuration
- Profitable sorting process

Technical data

Working width [mm]	1024	1280
Throughput up to [t/h]	3	3.8
Number of valves	320	400
Valve grid [mm]	3.2	3.2
Suitable grain sizes [mm]	2–20	2–20
Power [max. KVA]	3.4	3.4
Temperature range	+5 °C to +40 °C	
Protection class	IP54	

Available options

Device division	Splitting of the sorting device for parallel sorting of two material streams with different grain sizes
Sensor upgrade	Pre-wiring for potential sensor upgrades
Connection set	Set consisting of feed hopper, level sensors with speed control, and discharge chute
VISUDESK visualization software	Web-based visualization of Sesotec systems via OPC UA
Cooling system	Vortex cooling for use in environments with high temperatures

Application areas

Sensor combination/application	C	N	CM	CN	CMN
Main application			Material cleaning		
Plastic sorting		+++		+++	+++
Color sorting	+++		+++	+++	+++
Metal separation	+		+++	+	+++

MULTSENSOR SORTING SYSTEM

PURIFIER PERFORMER

The high-end sorting system for polymer flakes

Application for sorting flakes and regrind materials in plastic recycling

Free consultation
https://www.sesotec.com/contact

CMN	4	2–20 mm
Sensors	Working widths	Grain size

Powerful

- Very high material throughput of up to 9 t/h
- Fine valve grid for precise ejection of contaminants
- Enhanced NIR camera resolution for the detaction of even smaller contaminants
- Optional dual view: Our proven and reliable color detection from every side

Flexible

- Flexible sensor configuration for precise ejection
- Later sensor upgrades possible
- Up to 4 different sorting tasks on one device

User-friendly

- Optimized for quick maintenance tasks
- Low cleaning effort due to self-cleaning function

Technical data

Working width [mm]	768	1536	2304	3072
Throughput up to [t/h]	2.3	4.6	6.9	9.2
Number of valves	240	480	720	960
Valve grid [mm]	3.2	3.2	3.2	3.2
Suitable grain sizes [mm]	3–20	3–20	3–20	3–20
Power [max. KVA]	3.2	0.65	0.8	1.5
Temperature range	+5 °C to +40 °C			
Protection class	IP54			

Available options

Sensor upgrade	Pre-wiring for potential sensor upgrades
Connection set	Set consisting of infeed hopper, level sensors with speed control, and discharge chutes
Dust and Label Extraction	Connections for suctioning off dust and labels
VISUDESK visualization software	Web-based visualization of Sesotec systems via OPC UA

Application areas

Sensor combination/application	C	N	CM	CN	CMN
Main application	Sorting and Cleaning of PET and PE/PP materials				
Plastic sorting		+++		+++	+++
Color sorting	+++		+++	+++	+++
Metal separation	+		+++	+	+++

METAL SENSOR SORTING SYSTEM

MAG FLAKE

The high-end-sorting-system for metallic contaminants in plastic flakes and regrind materials

M	3	2–20 mm
Sensors	Working widths	Grain size

Application for sorting metallic contaminants in plastic recycling

Free consultation
https://www.sesotec.com/contact

Precise in detail

- Reliable detection and ejection of the smallest contaminants from 1 mm in size
- Suitable for a high number of metal particles in the plastic stream

Innovative

- Optimized sensor technology and chute geometry for the ejection of metallic contaminants of all kinds
- Very high resolution of the metal detection bar for targeted ejection of metallic contaminants

Profitable

- Low material loss compared to other solutions
- No cleaning or maintenance effort required
- Low downtime

Technical data

Working widths [mm]	1024	1536	1920
Throughput up to [t/h]	2.5	3.8	5
Number of valves	128	192	240
Valve grid [mm]	8	8	8
Suitable grain sizes [mm]	2–20	2–20	2–20
Power [max. KVA]	1.2	1.2	1.2
Temperature range	+5 °C to +40 °C		
Protection class	IP54		

Available options

Device division	Splitting of the sorting device for parallel sorting of two material streams
Connection set	Set consisting of infeed hopper, level sensors with speed control, and discharge chutes
VISUDESK visualization software	Web-based visualization of Sesotec systems via OPC UA

REMOTE ACCESS AND SERVICE HOTLINE

Fast, reliable service

Telephone support

Many questions and incidents can be resolved over the phone. Our free telephone support is available daily from 6 am to 8 pm and on weekends from 8 am to 5 pm.

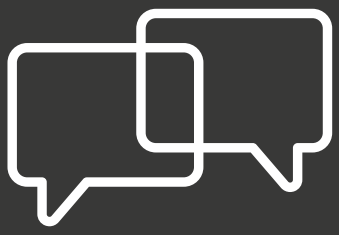
Service Hotline Sorting
+49 (0) 8554 308-129
service.sorting@sesotec.com

Remote Access

Sesotec service technicians have direct access to your machines via Ethernet connection and can perform error analyses, optimizations and parameter settings.

Augmented Reality

In addition to telephone support and remote access, Sesotec also offers video-based support with augmented reality. This is done via the TeamViewer Pilot app.



Want to learn more about our technology for the recycling industry?

Get in touch with us directly! We look forward to advising you. You can reach us at:

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