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# OUR EXPERTISE FOR **TOMORROW'S SOLUTIONS**

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Product & Application Catalog

[www.tomra.com/recycling](http://www.tomra.com/recycling)



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# TOMRA ORGANISATION

Today we live in an age with the highest level of consumption our planet has ever experienced. Following linear economic models, our natural resources are recklessly exploited, downcycled instead of recycled.

At TOMRA, we aim to protect our valuable resources and keep them in the loop. Our dedicated team of more than 4,000 employees provides a broad range of sensor-based solutions allowing for optimal resource recovery. Joining with impactful organizations and conducting research with partners, we passionately contribute our expertise to advance the recycling industry. Due to an increase in consumer awareness and legislation pushes, we make it our responsibility to respond to key market and consumer trends, which trigger fundamental yet vital changes necessary for more sustainable handling of our finite resources. In support of these trends, we strive towards creating production and consumption solutions seen through a circular lens. Together we are well-positioned for upcoming megatrends and ready to continue leading the resource revolution. Our people, products and services make a profound impact. Together with you, we can change the future.

Let's embrace tomorrow and create value out of waste.



**>4,000**  
EMPLOYEES



**>100**  
COUNTRIES



**>60%**  
MARKET  
SHARE





-  TOMRA Sorting Recycling Locations
-  Agents and distributors



**50 YEARS**  
EXPERIENCE



**>6,000**  
MACHINES GLOBALLY

## DRIVING THE CHANGE FOR AROUND 50 YEARS

Innovators in the field of sensor-based sorting solutions for the recycling industry, we TOMRA are developing and continuously optimizing our wealth of expertise since 1972. The demand for our solutions has grown vastly from base markets to emerging markets. Currently, there are more than 6,000 TOMRA machines installed worldwide, giving us a global market share of more than 60%. Our technology and equipment have proven to be an instrumental force in the world's most advanced recycling plants.

With 19% annual revenue growth from 2004 to 2019, we are in the fortunate position to invest even more into pioneering technologies, enter new markets and shape new business models. Our growth continues with new recycling legislative targets, geographic expansion and increased quality awareness.

We proudly look back on about 50 years of innovation and are confident our expertise will drive positive change in this dynamically evolving industry.



#### **FLYING BEAM®**

Our field-proven and highly efficient FLYING BEAM® technology features an integrated light source positioned inside the scanner enables a homogenous light distribution across the conveyor belt, thus leading to an excellent performance and stable sorting. Particularly energy efficient, FLYING BEAM® reduces the power consumption up to 70%. The innovative scanning point principle of FLYING BEAM® allows simultaneous detection of materials across the entire belt feed. By continuously monitoring the illumination and sensor response, real-time information of the machine's operation status is always available.

#### **GAIN**

Our artificial intelligence-based technology GAIN is a future-forward option for AUTOSORT units. Based on neuronal networks, GAIN is in a position to independently learn from huge amounts of data how to conduct prescribed sorting tasks across multiple demanding applications. Proven to boost performance, GAIN improves sorting accuracy and adds significant value to the sorting process.

#### **SHARP EYE**

With a seamless and intense focus on the scanning area of the conveyor belt, SHARP EYE identifies critical chemical property differences and even the finest molecular differences in materials. Utilizing higher light density and point-scanning systems, SHARP EYE not only separates single-layer PET trays from bottles, but also sorts mixed PET into different polymer types when combined with an AUTOSORT unit featuring FLYING BEAM® technology. Even when processing mixed materials, sorting efficiencies exceeding 95% are attained.

#### **TOMRA Insight**

The process to separate a mixed material stream into valuable resources requires optimization of various elements across the system. Our new, web based TOMRA Insight platform turns your sorters into connected devices that generate valuable data and process it into actionable information allowing the optimization of your overall yield. A safe and secure connection of TOMRA sorters, ensuring full privacy around customer data and enabling fast and efficient access to information, allows you to optimize the production process and excel within your market segment.

#### **DUAL PROCESSING TECHNOLOGY**

TOMRA's Dual Processing Technology unites the methods of Object and Area Processing for a more precise classification and sorting of materials. With Object Processing analyzing objects while considering its shape and dimension, it proves to be particularly beneficial for the identification of compounds. Area Processing on the other hand only processes pixels of the same material type and contiguous areas even at high throughput rates without single objects. The combination and simultaneous operation of these types of processing in TOMRA's Dual Processing Technology enables the machine to take a rule-based decision on which method to use and to thus achieve constant sorting results even at high throughput rates and with complex compounds.

#### **SUPPIXX®**

SUPPIXX® image processing technology allows for eight times higher resolution and eliminates noises caused by mechanical and electrical influences. With even the finest particles being identified and separated with great precision, increased product yields and higher purity levels are easily achieved.

#### **LASER OBJECT DETECTION**

For the recovery of black plastics, rubber, glass and other materials, TOMRA's Laser Object Detection (LOD) technology identifies what is undetectable by conventional NIR scanners and fills an unmet void and surpasses NIR limits for materials such as black plastics, rubber and glass. Through combining NIR and LOD sensors, it generates advanced sorting information that boosts sorting processes to new levels. Unlike standard technologies, LOD does not demand high energy draw and delivers high quality sorting results in a cost-effective and low energy consuming way for a variety of applications. LOD requires little investment to extend your application range considerably, as it fits perfectly with AUTOSORT and FINDER units.

#### **FLUID COOL®**

This technology features an illumination unit to deliver a constant and stable light source for maximized quality and yield. Coupled with a dual technology sensor system, FLUID COOL® provides unsurpassed color detection and recovery of materials with high purity levels - even with very fine material grains.

#### **DEEP LAISER®**

DEEP LAISER® is the next generation technology available for AUTOSORT units applicable for 3D object detection and sorting tasks solved with artificial intelligence. Originating from the Laser Object Detection technology, DEEP LAISER® is an integral part of the system and goes even one step ahead by detecting objects in a more precise way. In addition to its detection capabilities, its data supports sorting objects across various applications resulting in superior sorting precision.



**>750**  
MACHINES  
MANUFACTURED  
ANNUALLY

## **TECHNOLOGIES DEVELOPED AT TOMRA AND BY TOMRA**

Innovation was, is and will ever be at the center of sensor-based sorting technology. At TOMRA, we put our extensive experience, technological proficiency and passion for the environment into the development of our outstanding and advanced sorting solutions. At our production facilities in Mülheim-Kärlich (Germany) and Bratislava (Slovakia), we manufacture 750 machines and their core technology annually. Thanks to the strength and commitment of our expert team, our cutting-edge technology is developed, produced and manufactured entirely in-house. Both production and development of our cutting-edge technology are the result of a strong team that works on new solutions and with great commitment - every day.

Combining our extensive application and industry knowledge with in-house manufacturing, we provide first-hand sorting solutions. Every TOMRA unit meets the highest quality and safety standards possible, while also setting new industry benchmarks.



**BY 2025** SOLID WASTE GENERATION WILL **INCREASE BY 70%** COMPARED TO 2010 LEVELS



**20% OF PLASTIC PACKAGING** COULD BE PROFITABLY RE-USED AND **50% COULD BE PROFITABLY RECYCLED IF DESIGNED** FOR AFTER USE SYSTEMS

## WASTE MARKET

**ONE GLOBAL PROBLEM MEETS MULTIPLE SOLUTIONS FOR ALL WASTE SORTS**

Global waste generated reached unsurpassed levels, which is mainly due to the way we manufacture and consume our valuable and limited resources. Thus, we are all part of the problem, but part of the solution too.

At TOMRA, we surely can't solve all the waste management problems, but we can contribute to it and make it our priority to devote our skills and experience to the development of frontrunning sensor-based sorting solutions by recovering precious materials from nearly any kind of waste streams, we are turning waste into value again.





## MAIN APPLICATIONS

### Packaging

thermoplastics, beverage cartons, paper, board, glass

### Municipal Solid Waste

thermoplastics, mixed paper, cardboard, metals

### Thermoplastics

PET, PP, PVC, PS, LDPE, LLDPE, HDPE, trays, bottles, homo vs. co-polymer, injection or blow molding qualities, PET-Bottles vs PET-Trays

### Paper

cardboard, deinking, mixed paper

### Commercial & Industrial Waste

thermoplastics, paper, cardboard

### Construction & Demolition Waste

inert material, wood, thermoplastics, metals

### Organic Waste

inert material, organic material, impurities

### Refuse Derived Fuel

sort to get constant calorific value and low chlorine content

### Bulky Waste

wood, paper, board, thermoplastics

### Wood

wood, wood chips, wood from ASR

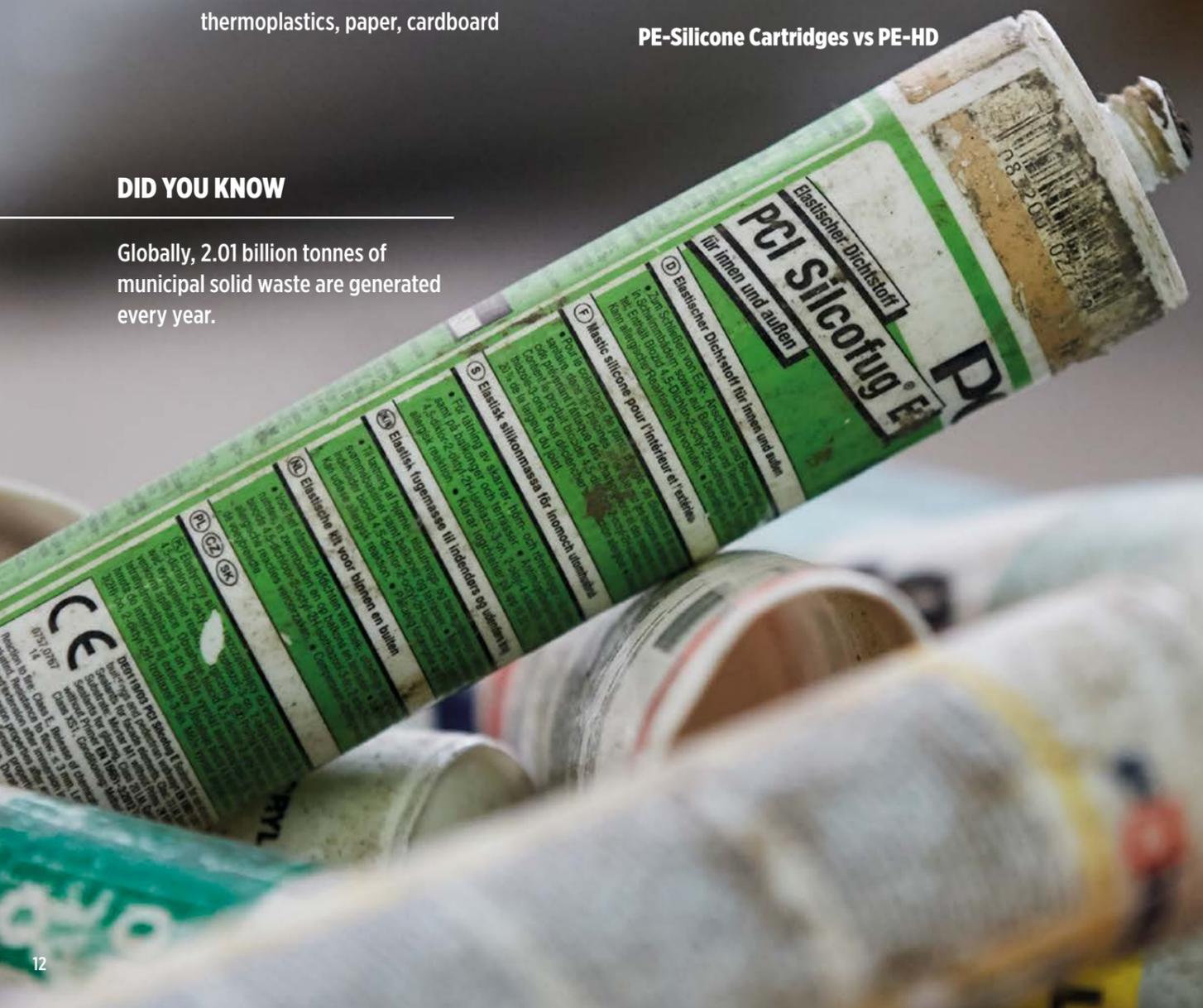
### Electronic Scrap - WEEE

PCB, wire, WEEE thermoplastics

### PE-Silicone Cartridges vs PE-HD

## DID YOU KNOW

Globally, 2.01 billion tonnes of municipal solid waste are generated every year.



# AUTOSORT



New generation FLYING BEAM®



Integrated Deep Learning Technology



Extended resolution for fines sorting



## DESCRIPTION

The newest generation of AUTOSORT combines leading-edge features and technologies in one machine. Compact and flexible in construction, AUTOSORT allows for an uncomplicated integration into existing and new plants. Equipped with our proven FLYING BEAM® technology, this next generation AUTOSORT enables intensified light information for heightened performance and operational efficiency.



## MACHINE SIZES

1000	1400	2000	2800
Width 1,800mm	Width 1,800mm	Width 2,800mm	Width 3,600mm
Length Belt 5,000mm	Length Belt 5,000mm	Length Belt 5,000mm	Length Belt 5,000mm
Length 7,400mm	Length 7,400mm	Length 7,400mm	Length 7,400mm
Weight* 190kg	Weight* 215kg	Weight* 270kg	Weight* 300kg
Power Consumption 1.5kW**	Power Consumption 1.6kW**	Power Consumption 1.7kW**	Power Consumption 1.9kW**

### Valves

TS100/TS200/TS400/TS1500

### Nozzles

4mm/12.5mm/25mm/6.25mm

\* The data is indicative and application-dependent. Exact data upon request. \*\* Only AUTOSORT components



## TECHNOLOGIES

- FLYING BEAM®
- SHARP EYE
- GAIN (optional)
- DEEP LAISER® (optional)



## DON'T RISK

Don't risk not being prepared for future market trends.



## QR CODE TO SCAN





## MAIN APPLICATIONS

Robot for re-sorting of product streams previously sorted with AUTOSORT

### Packaging

thermoplastics, beverage cartons, board

### Thermoplastics

PET, PP, PVC, PS, LDPE, LLDPE, HDPE, trays, bottles, homo vs. co-polymer, injection or blow molding qualities

## DID YOU KNOW

If there is no action taken now, global waste production will reach 3.4 billion tonnes in 2050, a 70% increase.

# AUTOSORT CYBOT



Multisensor system



Modular construction



New generation FLYING BEAM®



COMING SOON



## DESCRIPTION

Continuing our pioneering tradition, AUTOSORT CYBOT is the first waste sorting robot on the market to combine four essential technologies at once. Seamlessly interacting with AUTOSORT units and equipped with a robot arm, sensors detect objects based on their properties before the fast picking robot arm subsequently sorts the objects into one of four separate target fractions. Its capability of identifying and sorting four distinct materials makes AUTOSORT CYBOT the ideal solution for achieving the highest sorting accuracy and purity levels.



## TECHNOLOGIES

- DEEP LAISER®
- FLYING BEAM®
- SHARP EYE
- SUPPIXX® (optional)



## MACHINE SIZES

600	
Width	2,403mm
Length	3,947mm
Height	3,485mm
Weight*	2,000kg
Sorting Fractions	4+1

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk missing out on continuous output efficiency!



## QR CODE TO SCAN





## MAIN APPLICATION

**Packaging/Film**  
LDPE

**Paper**  
cardboard, deinking, mixed paper

## DID YOU KNOW

Annually, as many as 1,000,000 sea creatures are killed by plastic bags and other plastic garbage disposed of in the ocean.

# AUTOSORT SPEEDAIR



Closed air loop



High belt speed



Low risk of material blockage



## DESCRIPTION

Light materials often don't lie still and are hard to detect when transported on high-speed conveyor belts. With the new AUTOSORT SPEEDAIR add-on for AUTOSORT machines, fan-driven air inlets generate a steady stream of air above the rapidly moving conveyor belt to stabilize light materials, making it easier to identify fractions. Reducing material movement on a fast-moving conveyor belt moving thus brings higher throughput rates and purity levels.



## TECHNOLOGIES

**FLYING BEAM®**  
**SHARP EYE**  
**DEEP LAISER® (optional)**



## MACHINE SIZES

1000		1400		2000		2800	
Width	2,750mm	Width	3,150mm	Width	3,750mm	Width	4,550mm
Length total	9,300mm						
Length belt	6,000mm						
Max. Height	2,800mm						
Weight*	5,200kg	Weight*	5,600kg	Weight*	6,100kg	Weight*	7,600kg

Valves	Nozzles
TS200/TS400	12.5mm/25mm

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk losing valuable material on high-speed belts!



## QR CODE TO SCAN





## MAIN APPLICATION

Glass from Municipal Solid Waste  
mixed Glass

### DID YOU KNOW

The waste generated by production and human consumption is exactly what we work with and what our machines process to help its transformation back to valuable products.



# AUTOSORT LASER



FLYING BEAM® technology



Differentiation between  
transparent polymers and glass



Off-belt scanning process



### DESCRIPTION

Equipped with an independent background system combined with laser, electromagnetic and NIR-technology, AUTOSORT LASER enables the effective processing of household and commercial waste. Separating metals, plastics, ceramics, stones, porcelain and glass from transparent polymers is no longer a challenge.



### TECHNOLOGY

FLYING BEAM®



### MACHINE SIZES

1200		1800		Valves	Nozzles
Width	2,400mm	Width	3,200mm	TS400	6.25mm
Length	2,300mm	Length	2,300mm		
Height	2,145mm	Height	2,145mm		
Weight*	2,810kg	Weight*	3,272kg		

\* The data is indicative and application-dependent. Exact data upon request.



### DON'T RISK

Don't risk missing on a sorting solution developed for unique and niche sorting tasks!



### QR CODE TO SCAN





## MAIN APPLICATION

Glass from Municipal Solid Waste  
mixed Glass

### DID YOU KNOW

With resources being finite, turning to them and defining the way to best use them for greater sustainability becomes paramount. Their value and quality has to be kept.



# AUTOSORT COLOR



Extendible valve block



Self-cleaning function



Heavy duty machine design



### DESCRIPTION

Further processing the glass material subsequently sorted by the AUTOSORT LASER, the AUTOSORT COLOR purifies the sorting result by color separation with unprecedented effectiveness, offers high throughput rates and guarantees a minimum of 95% purity.



### TECHNOLOGY

FLUID COOL<sup>®</sup> LED



### MACHINE SIZES

1200		Valves	Nozzles
Width	2,450mm	TS400	6.25mm
Length	3,500mm		
Height	2,402mm		
Weight*	4,990kg		

\* The data is indicative and application-dependent. Exact data upon request.



### DON'T RISK

Don't risk operational disruptions, downtime and costs from glass in your sorting machines.



### QR CODE TO SCAN





## MAIN APPLICATIONS

Electronic Scrap - WEEE  
PS / ABS, PC ABS, PC, PVC, PP, PE



### DID YOU KNOW

32% of all plastic packaging made ends up in nature every year.

# AUTOSORT BLACK



Inhouse development of core components



Sorting of grain sizes >20 x 20mm



Optimized heatsink system



## DESCRIPTION

Previously undetectable by NIR sorting technology, black plastics can now be identified and sorted by the AUTOSORT *BLACK* plastic sorter. The machine is capable of differentiating between black plastics such as black PE, black PP, black PET and PS without pre-shredding. This unit not only fills a gap in waste sorting technology – it creates value. With its high throughput and enhanced resolution, AUTOSORT *BLACK* delivers a quick ROI for black plastics.



## TECHNOLOGY

MIR TECHNOLOGY



## MACHINE SIZES

1200	1800	Valves	Nozzles
Width	2,400mm	Width	3,200mm
Length	2,300mm	TS400	6.25mm
Height	2,145mm	Length	2,300mm
Weight*	2,810kg	Height	2,145mm
		Weight*	3,272kg

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk losing out on the value of black plastics!



## QR CODE TO SCAN





## MAIN APPLICATIONS

### Electronic Scrap - WEEE

PS, ABS, PC ABS, PPO, PPE, PC, PBT, PMMA, PP, PE



### DID YOU KNOW

Recycled plastics have become an increasingly valuable feedstock for industries, both at home and abroad.

# AUTOSORT FINES



Multiflexible system



FLYING BEAM® technology



Precise ejection system



## DESCRIPTION

Applying features of the AUTOSORT family, the AUTOSORT *FINES* sorts small (polymer) fractions across multiple applications and generates high purity levels based on the unchallenged FLYING BEAM® technology and high-speed valves. The machine has no external lamps, which results in high dust protection, lower maintenance and less downtime.



## TECHNOLOGY

FLYING BEAM®



## MACHINE SIZES

1200	1800	2400	Valves	Nozzles			
Width	2,000mm	Width	2,600mm	Width	3,200mm	TS200	6.25 (1:1)
Length Belt	4,000mm	Length Belt	4,000mm	Length Belt	4,000mm	TS400	6.25 (1:1)
Length	6,420mm	Length	6,420mm	Length	6,420mm		
Weight*	3,990kg	Weight*	4,815kg	Weight*	6,370kg		
Power Consumption*	4.3kW	Power Consumption*	6.1kW	Power Consumption*	7.5kW		

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk missing the opportunity to recover even the smallest fractions.



## QR CODE TO SCAN





## MAIN APPLICATION

### Online Analysis

RDF (analyzing calorific value, chlorine and water content)

## DID YOU KNOW

Around 25.8 million tonnes of plastic waste are generated in Europe every year.

# AUTOSORT *RDF*



FLYING BEAM® technology



Inhouse development of core components



Constant online monitoring



## DESCRIPTION

Contributing to an optimized quality management, the AUTOSORT *RDF* online analysis tool detects and analyzes fuel material with regards to the calorific value, water and chlorine content. AUTOSORT *RDF* helps overcome the challenge of assuring quality and provides accurate and timely measurements of critical values during running times.



## TECHNOLOGY

FLYING BEAM®



## MACHINE SIZES

600	1000	1400			
Width	1,400mm	Width	1,800mm	Width	2,200mm
Length Belt	5,000mm	Length Belt	5,000mm	Length Belt	5,000mm
Weight*	135kg	Weight*	170kg	Weight*	200kg
Power Consumption	1.3kW	Power Consumption	1.5kW	Power Consumption	1.6kW

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk incinerator downtime caused by varying quality in refuse-derived fuel!



## QR CODE TO SCAN





## MAIN APPLICATIONS

**PET Flakes**  
purifying PET Flakes

**PO Flakes**  
purifying PE/PP Flakes

**PVC Window Frames**  
purifying PVC



### DID YOU KNOW

Continuing current practices there will be more plastic than fish in the ocean by 2050.

# AUTOSORT FLAKE



Single-point detection



Active temperature control



Extended resolution



## DESCRIPTION

Regardless of grain sizes, the AUTOSORT FLAKE simultaneously masters three challenges: detecting color, metals and material information. Its unique combination of foreground and background illumination allows for the separation of even more flake variations, thus considerably enhancing sorting performance.



## TECHNOLOGY

FLYING BEAM®



## MACHINE SIZES

		Valves	Nozzles
1200			
Width	1,900mm	TS100B	4mm
Length	2,000mm		
Height	2,300mm		
Weight*	1,850kg		
Power Consumption	10kW		

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk valuable material loss by not relying on the highest resolution available for flake sorting.



## QR CODE TO SCAN





## MAIN APPLICATIONS

### PET Flakes / PO Flakes

- purifying PET Flakes
- purifying transparent and opaque Flakes
- sorting of mixed color Flakes



## DID YOU KNOW

In Europe, up to 500,000 tonnes of plastic, equal to 66,000 rubbish trucks, enter the ocean every year.

# INNOSORT FLAKE



All-in-one solution



Next level quality



Low initial investment



## DESCRIPTION

Designed especially for high-quality recovery of PET flakes, INNOSORT FLAKE combines color and material sorting to reliably remove PVC, metals and opaque flakes from waste streams. It eliminates vast proportions of contaminants with its high-resolution FLYING BEAM® technology capable of 2mm polymer recognition. With capacity up to 6 ton/hour, ultra-high-resolution camera and NIR sensors, INNOSORT FLAKE significantly reduces PET flake material loss to less than 2% thus increasing yields.



## TECHNOLOGY

FLYING BEAM®



## MACHINE SIZES

1000	1500	2000	Valves	Nozzles			
Width	1,751mm	Width	2,279mm	Width	2,843mm	TS120	4.75mm
Length	1,831mm	Length	1,831mm	Length	1,831mm		
Height	2,144mm	Height	2,144mm	Height	2,144mm		
Weight*	980kg	Weight*	1,100kg	Weight*	1,300kg		
Power* (3-phase)	2.2kVA	Power* (3-phase)	3.5kVA	Power* (3-phase)	4.7kVA		
Power* (1-phase)	3.0kVA	Power* (1-phase)	5.0kVA	Power* (1-phase)	5.1kVA		

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk investing in complex PET sorting processes, when our all-in-one solution sorts by both material and color.



## QR CODE TO SCAN





ONLY **3% OF ALUMINUM SCRAP**  
CANNOT BE RECYCLED



**75% OF ALUMINUM** PRODUCED  
IS CURRENTLY **STILL BEING USED**

## METAL MARKET

**HARD CHALLENGES SOLVED TO PROTECT PRECIOUS  
RESOURCES OF ALL METAL TYPES**

Challenges many recyclers face include increasing recycled metal quality standards and providing pure mono-fractions. A global metal production of three-digit ton rates provides the capability to apply the right technology to recycled material and meet these standards.

For us, the metal recycling's principle of saving virgin material and generating high-purity materials is central to the development of our metal application machines and technologies. Our metal sorting machines offer a way to recycle material to higher purity rates. In turn, less precious virgin materials are consumed, less costs expended and the environment is protected - a win-win situation for all.



## MAIN APPLICATIONS

**ASR**  
metal recovery

**Electronic Scrap - WEEE**  
PCB, wire, aluminum

**Wire Recovery**  
cable & wire material

**Wood**  
wood chips

**Ash Recycling**  
recovery of ferrous- & non-ferrous metals

## DID YOU KNOW

Each year, worldwide Auto Recycling Industry recycles more than 25 million tons of waste materials which are collected from out of order cars.



# FINDER



Multiflexible sensor system



Software based object processing



Modular design



## DESCRIPTION

FINDER dominates in sorting high purity fractions regardless of the materials complexity or grain size. Utilizing patented technologies, FINDER detects metal objects with ultra-precision, resulting in exceptionally high yields and purity levels. Ultra-flexible thanks to its modular design, the machine is applied for various mixed waste streams and metal applications.



## TECHNOLOGY

**SUPPIXX®**  
**Z-TECT**  
**INTELLIGENT OBJECT RECOGNITION**



## MACHINE SIZES

1200	1800	2400	Valves	Nozzles			
Width	2,000mm	Width	2,600mm	Width	3,200mm	TS400	6.25 (1:1)
Width Belt	1,200mm	Width Belt	1,800mm	Width Belt	2,400mm	TS1500	6.25 (1:2)
Length Belt	4,000mm	Length Belt	4,000mm	Length Belt	4,000mm		
Length	6,420mm	Length	6,420mm	Length	6,420mm		
Height	2,120mm	Height	2,120mm	Height	2,120mm		
Weight*	3,800kg	Weight*	4,600kg	Weight*	6,100kg		
Power Consumption	5kW	Power Consumption	5.5kW	Power Consumption	7.5kW		

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk investing in a static system when FINDER offers enough flexibility and high performances across diverse metal applications.



## QR CODE TO SCAN





## MAIN APPLICATIONS

**E-SCRAP PACK**  
flame retardants

**ORGANIC PACK**  
inert material, organic material

**WOOD PACK**  
cleaning of wood chips

**ALUMINUM PACK**  
aluminum alloys, aluminum vs heavy metals, recovery of ferrous & non-ferrous metals, PCB, wire, aluminum, aluminum alloys vs heavy metals

**HIGH POWER PACK**  
aluminum alloys, aluminum vs heavy metals, recovery of ferrous & non-ferrous metals, PCB, wire, aluminum, aluminum alloys vs heavy metals

**FINES PACK**  
aluminum vs heavy metals  
5-40mm



## DID YOU KNOW

Aluminum can be endlessly recycled without losing in quality or properties.

# X-TRACT

**NEW!**  
X-TRACT for magnesium removal



**DUAL PROCESSING** technology



Inhouse development of core components



Zorba Fines processing



## DESCRIPTION

Dedicated for fulfilling higher sorting performances and equipped with TOMRA's DUOLINE Technology and Multi-Density-Channels, the X-TRACT sorts even the most complex material mixes for a broad range of metal applications with outstanding precision and reliability. High throughput levels as well as top-quality end products are the results of the perfect interaction of the well-established Dual Processing Technology and exclusive software. The new integrated ACT user interface provides critical information and real-time process data enabling constant control.



## TECHNOLOGY

**DUAL PROCESSING**  
**DUOLINE**  
**MULTI-DENSITY CHANNELS**



## MACHINE SIZES

1200	2400**	Valves	Nozzles
Width	2,000mm	Width	2,600mm
Width Belt	1,200mm	Width Belt	1,800mm
Length Belt	4,000mm	Length Belt	4,000mm
Length	6,420mm	Length	6,420mm
Height	2,120mm	Height	2,120mm
Weight*	7,400kg	Weight*	15,000kg
Power Consumption	9kW	Power Consumption	10kW
		TS1500	6.25 (1:2)

\* The data is indicative and application-dependent. Exact data upon request.  
\*\* Only available for High Power Pack.



## DON'T RISK

Don't risk losing out on the recovery of valuable metals when advanced technology can help.



## QR CODE TO SCAN





## MAIN APPLICATIONS

### End-of-life Vehicle Scrap

unalloyed steel, plastics, glass, compound materials

### Electronic Scrap - WEEE

PCB, wire, grey metals, copper, brass

### Non-ferrous Metals

grey metals, copper, brass

### Zorba

grey metals, copper, brass



## DID YOU KNOW

Recycling a can requires 95% less energy and water than create one from virgin materials.

# COMBISENSE



Active temperature control



Stable color range



Optimized operational costs



## DESCRIPTION

Offering unsurpassed color detection and multi-parameter fraction separation, COMBISENSE eliminates most contaminants from even the most challenging ELV, WEEE and metal waste streams. By allowing granulates to pass through the sorting system twice, high purity levels and a maximum of mono fractions recovery are achieved.



## TECHNOLOGY

FLUID COOL®  
DUAL PROCESSING



## MACHINE SIZES

1200	Valves	Nozzle Pitches
Width	2,480mm	TS1500 8 mm
Width Belt	1,200mm	
Length Belt	3,960mm	
Length	5,650mm	
Height	1,830mm	
Weight*	3,770kg	
Power Consumption	10kW	

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk investing in multiple machines for extracting vast amounts of valuable metals when COMBISENSE can separate numerous fractions in subsequent steps.



## QR CODE TO SCAN





## MAIN APPLICATIONS

**Granulated Copper Material**  
fines metal fractions

**Mixed Metal Sorting**  
copper, brass, grey metals

**Red Metal Sorting**  
copper, brass

## DID YOU KNOW

Primary production of copper requires 80-90% more energy than recycling copper. Saving 40 million tonnes of CO<sub>2</sub> annually is equal to taking 16 million passenger cars off the road.



# COMBISENSE CHUTE



Active temperature control



Stable color range



Optimized operational costs



## DESCRIPTION

Suitable across multiple metal applications, COMBISENSE CHUTE excels in extracting high purity metal fractions from a multi-parameter material mix regardless of fraction complexity. With its CRGB camera, COMBISENSE CHUTE detects materials as small as 2 mm and sorts it based on color, shape and size. By offering an unprecedented number of sorting programs, COMBISENSE CHUTE stands for unsurpassed levels of variability.



## TECHNOLOGY

**FLUID COOL\***  
**DUAL PROCESSING**



## MACHINE SIZES

1200	Valves	Nozzle Pitches
Width Infeed	1,200mm	TS100 4 mm
Width	2,150mm	
Length	1,990mm	
Height	2,990mm	
Power Consumption	5.7kW	

\* The data is indicative and application-dependent. Exact data upon request.



## DON'T RISK

Don't risk managing multiple sorting units when COMBISENSE CHUTE provides numerous programs in one machine.



## QR CODE TO SCAN



# RESEARCH AND DEVELOPMENT - DIRECTING THE FUTURE OF BUSINESS

Change and development is the key to achieving and maintaining a leading position in the market. Only when thinking ahead of a fast pacing market and fulfilling new market requirements in a prompt way and with the right solutions, the recycling industry can be advanced and brought to the next level. Our R&D department remarkably shapes our business. We create innovations that offer solutions for current unresolved tasks by conducting profound research, based on which technologies are developed or optimized. All our products are the reflection of dedicated work and help us achieve future growth, reinforcing our competitiveness and positioning as an industry pioneer.

Developing solutions in-house helps you benefit from direct reaction, faster integration of new techniques and bundled expertise – expertise exclusively developed by and at TOMRA.



**OVER 8%**  
OF REVENUE  
IN R&D



**OVER 20%**  
OF ALL EMPLOYEES  
WORK IN IN-HOUSE  
IN R&D



**INNOVATION**



**PASSION**



**RESPONSIBILITY**

## WE ARE TOMRA, YOUR TRUSTED PARTNER

We are more than a supplier. We are your trusted, reliable partner offering high competence and full service at any place and any time.

### Trust in...

#### ...our experience

More than 50 years of experience has helped us gather the necessary knowledge to successfully contribute to the furtherance of the recycling industry through state-of-the-art technology.

#### ... our success

Being responsible for the development of the world's first high capacity near infrared (NIR) sensor for waste sorting applications, we are claimed to be an industry pioneer with a dedication to extracting high purity fractions from almost any kind of waste streams.

#### ...our values

All our actions are a reflection of our company values:

We commit ourselves to care for the environment, to be transparent and open in communication – we act **responsibly**. We dare to explore and to find new solutions to find solutions to current and future challenges – we are **innovative**. We believe in what we do, we engage and inspire to participate in making a change – we are **passionate**.





### YOUR BENEFITS

- Test your own material
- Detailed test reports
- Development of individual process design



**TOMRA TEST CENTERS:**  
Germany, China, South Korea  
**PARTNER TEST CENTERS:**  
US, Japan

## OUR TEST CENTERS

Finding customized solutions across various applications and suitable for any kind of sorting plant is key to us. In our test centers, our experienced application engineers are at hand to conduct comprehensive tests with your material. Based on valuable information gained during the testing process, innovative workflows maximizing operational productivity are developed and the most efficient sorting solutions for your specific needs defined.



**>160**  
SERVICE ENGINEERS  
GLOBALLY



**16**  
SERVICE HUBS AROUND  
THE WORLD



## OUR GLOBAL SERVICE TEAM

Delivering world-class sorting solutions is only part of our commitment to you. As a comprehensive service partner, our dedicated service team keeps your system running at its best. At TOMRA, we go above and beyond with individualized care to ensure your success.

Our global team of more than 160 service engineers are strategically located at 16 service hubs around the world. Available on short notice, they provide excellent assistance in the pre-sales, @sales or post-sales phase to ensure maximum performance and minimum downtimes at plannable costs.



#### **Consultation**

With our profound and established experiences accumulated from more than 6,000 machine installation in more than 100 countries, we provide expert advice and find the best applicable solution for your plant.

#### **Material tests**

If required, we offer trials of your sample material in our test facilities. We create a flow sheet featuring the optimal sorting process for your field of application and sorting task.

#### **Evaluation**

We provide an investment analysis to help identify maximum benefits or potential issues integrating sorting machines can have on your operations.

#### **Customized package**

We offer full-service solutions consisting of machinery, delivery, spare parts and first-class after-sales service.

#### **Commissioning**

A team of field service, optimizer, customer project manager, and sales engineers participate in commissioning process and sets up your machine(s). Subsequent in-depth training familiarizes you with maintenance and operating process.

#### **After-sales service**

With a presence in 16 service hubs around the globe or assisting remotely, you benefit from comprehensive after-sales support with a rapid response time.

## **OUR SALES PROCESS**

We turn challenge into opportunity, mixed waste streams to pure end materials, waste into value – together with and for you!

As your trusted partner, we not only help you meet short-term objectives but also deliver long-term success and reliably accompany you throughout the sales process, from planning to implementation to ongoing optimization.

As a technology leader, TOMRA Sorting Recycling continues to be pioneer in sensor-based sorting in the waste and metal recycling industries. With over 6,000 units installed in more than 100 countries, our expertise and superior service allow us to deliver high-performance sorting and analytical solutions to our customers in a broad range of applications.

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