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# Optoelectronics











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# **AI and Optoelectronics**

#### Intelligent Sorting Equipment Provider

DataBeyond was founded in 2018, leading the high-end intelligent sorting technology applied globally. DataBeyond making high-end intelligent sorting equipment more affordable and accessible to recycling manufacturer. We aim to accelerate the arrival of the intelligent era in recycling. DataBeyond's optical sorters not only lead in domestic market but also are widely exported to dozens of countries and regions, including Japan, Malaysia, Indonesia, Brazil, Dubai, Saudi Arabia, India, etc., earning high praise and popularity among users.

**NO.1** Top Sales in China

≥85% Front-end Waste Recycling

3000+ Project Cases Worldwide 20000m<sup>2</sup> Intelligent Equipment R&D and

Production Base

Market Share in China



30+ Turnkey Project Case

300+ Chinese Intellectual Property



### DataBeyond Technologies

#### Α

#### **Artificial Intelligence Sorting Technology**

DataBeyond utilizes its advanced backbone network, DataBeyondNet, to achieve accurate identification. This includes a highly efficient industry-specific model and the industry's pioneering structured waste big data image library. These innovations greatly enhance computational speed, enabling high-speed conveyor vision inspections of up to 6m/s.

#### **AI**·SPEC<sup>™</sup>

#### Hyperspectral Sorting Technology

DataBeyond Technology's Proprietary AI·SPEC™ Software and Hardware System, DataBeyond Technology has developed the AI·SPEC<sup>™</sup> software and hardware system, which utilizes 256 spectral bands to precisely identify hundreds of different materials. This system can even recognize composite plastic packaging made from multiple materials and waste paper with varying fiber densities.

#### Al·Laser™ **Laser Sorting Technology**

DataBeyond innovatively integrates laser sorting technology with AI, creating the powerful AI·Laser™ sorting technology. By comprehensively detecting multiple dimensions such as object spectrum and spatial characteristics, it further enhances material identification accuracy and sorting purity.

#### **AI**•**FLUO**<sup>™</sup>

#### Fluorescence Aging Sorting Technology

DataBeyond leads the industry by combining fluorescence aging sorting technology with AI to develop the distinctive AI·FLUO™ sorting technology. Prior to crushing PET bottles, AI·FLUO™ can actively segregate aged and fluorescent bottles, decreasing the presence of aged and fluorescent fragments in bottle flakes and significantly enhancing flake quality.

#### **FLYinVision™**

#### **High-Speed Imaging Technology**

DataBeyond's FLYinVision<sup>™</sup> technology, combined with synchronous belt tracking functionality and a high-speed scanning system, enables rapid scanning of materials on a conveyor belt moving at speeds of up to 6m/s. This system captures multidimensional features of the materials, even identifying ultra-fine characteristics that are imperceptible to the naked eye.

#### **MultiSensor**

#### **Multisensor Fusion Technology**

DataBeyond's MultiSensor technology supports the combination of various sensors, including visible light, near-infrared, X-ray, fluorescence, laser, hyperspectral, and metal detectors. Employing fuzzy logic and deep neural network algorithms, it performs decision-level fusion on multiple heterogeneous data sources.

#### **Cloud Brain DataBeyond Cloud Brain**

DataBeyond Cloud Brain combines edge, terminal, and cloud technologies, continuously monitoring data from various sensors. It achieves remote intelligence enhancement, predictive maintenance of equipment, and 365 days \* 24 hours real-time monitoring and management.

#### **MSWDataBase Municipal Solid Waste Big Database**

DataBeyond's MSWDataBase<sup>™</sup> is the most extensive and comprehensive solid waste database in China. It encompasses a wide range of waste sorting scenarios, including renewable resources and urban solid waste. By collecting data from numerous waste treatment plants, it has built a vast image library that is extensively labeled and multi-dimensional, establishing a strong data advantage.

#### Awarded over 300 national patents



#### Received over 10 national, provincial, and municipal honors





National Level Professional, Refined, Distinctive, and Innovative "Little Giant" Enterprise Award



Province Science and Technology SMEs



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Intelligent Optoelectronic Sorting Equipment Engineering Technology Research Center

# **01** Recycling

### Our Comprehensive "Point-Station-Field" Recycling Operations Solution >>

Point Front-end recycling network system **◎禁城郡道** Serving Government residents offices 9 8 Ô 0 0 0 Schools 04E Businesses P7.488484824 (488) \* 對这書 **東中区共主政策場合分紛中心** \* 群滚去 Hospitals Industrial Facilities We offer custom online recycling apps to achieve a seamless urban recycling network that combines online and offline channels

# **Station** Traditional and **Smart Recycling Stations** Smart weighing Car storage/recycling station micro recycling stations Eco-friendly sorting centers Tax compliance Options for vehicle-based, container-based, or recycling station setups Converting traditional mobile recyclers into standardized micro-recycling station operators



#### 06

# **O2S**orting

### Renewable Resources Sorting >>

DataBeyond's AI Optical Sorter is suitable for sorting various renewable resources.

- Separate various types of high-value plastics from mixed plastics, such as PET, PP, HDPE, LDPE, PC, PVC, etc.
- Separate plastics by the term of different colors, grades, and applications
- Separate paper by the term of yellow waste paper, white waste paper, miscellaneous paper (cigarette cards, medicine cards, folding box board(FBB), solid bleached sulphate(SBS), gray cards), tetra pak packaging, etc.
- Separate metal, including automobile recycling, appliance recycling, electronic waste recycling, battery recycling, etc.

### **Municipal Solid Waste So**

DataBeyond provides a stable and reliable sorting soluti the goals of 'resource utilization, reduction, and harmle: ed partner for an increasing number of customers wo overall solution design, equipment manufacturing, on DataBeyond's intelligent sorting machine, we can sepa ultimately turning waste into treasure. If you are seeking of municipal solid waste, DataBeyond's intelligent sorti can tailor a solution to meet your needs.





**PP container** 



HDPE



**Mixed Household Waste Construction and D** Waste









### **Top Perfromance Of Product Combination** for Recycling Manufacturer to Establish "Dark Factory"

### Mini & Medium AI Optical Sorter Series

- Applicable to large bottle recycling plants for secondary sorting of miscellaneous materials, cost-effective, and reducing labor costs.
- Applicable to bottle depot and small flake washing plant.
- Equipped with hyperspectral sensor.
- Equipped with mainstream domestic motors,200-type metal roller shafts, laser line-scan cameras, and an anti-rebound material catching bin.
- High-speed conveyor belt velocity 1.8m/s-2.2m/s.
- Identification accuracy≥99.6%.
- IP65 protection rate for electronic control system.
- IP65 protection rate for valve bank system.



Data-driven optimization by DataBeyond Cloud Brain

### **Large AI Optical Sorter Series**

- Applicable to large-Scale bottle flake washing plant's mainline or MRF, with high processing capacity and stability.
- Equipped with hyperspectral sensor, metal detector, fluorescence sensor and laser sensor.
- Equipped with German-imported SEW motors, 350-type metal roller shafts, laser line-scan cameras, and stainless steel dual-layer material catching bins.
- 3.5m/s-4.2m/s High-speed conveyor belt velocity.
- Identification accuracy≥99.6%.
- IP65 protection rate for electronic control system.
- IP65 protection rate for valve bank system.





2.Configurations are subject to change, please refer to the actual configuration. 3. The equipment capacity is related to the actual working conditions, please refer to the actual conditions. 4. The above feeding amount is taken as an example of PET bottles.

indicates a conveyor length of 4 meters B indicates a conveyor width of 1.8 meters





#### Large AI Optical Sorter Series

### **AI Optical Sorter**

#### An AI Optical Sorter with "Human-like" Judgment Capabilities

The upgrade generation of AI optical sorter, FASTOAI®, boasts industry-leading AI identification capabilities. It integrates DataBeyond's independently developed high-speed conveyor belt, with the entire machine 100% produced by DataBeyond. It can flexibly incorporate hyperspectral sensors, fluorescence sensors, metal detectors, laser sensors, X-ray sensors, and more. Data-driven optimization by DataBeyond Cloud Brain, continuously making recycling smarter.

- The upgrade generation FLYinVision™ technology supports to conveyor belt speed of 4.2m/s, increasing throughput by 20% compared to the previous generation.
- The feeding of PET bottles can reach up to 10 tons per hour, while the mixed plastic input can go as high as 15 tons per hour.
- The upgrade generation identification technology ensures a detailed view of small objects and subtle errors with exceptional precision.
- 3.5m/s-4.2m/s High-speed conveyor belt velocity.
- Featuring a completely redesigned exterior, integrated body for enhanced durabi operating in ultra-low temperature environments down to -35°C.

#### Configurable to meet varying electrical requirer

\*The above data is for reference only; please refer to the actual equipment for accuracy. Sorting accuracy may var

#### **Applications**

- Mixed Municipal Waste Sorting
- Construction and Demolition
   Waste Sorting
- Industrial and Commercial Waste Sorting
- Medical Waste Sorting
- Garden Waste Sorting
- Bulky Waste Sorting
- Food Waste Sorting
- Organic Waste Sorting
- Mixed Household Plastic
- PET Bottle Sorting
- HDPE Bottle Sorting
- PP Food Container Sorting





### Al Optical Sorter FASTOAI · SPEC®

#### Capable of Simultaneously Identifying 256 of Materials, Including the Sorting of Plastic Films

- Known as the AI & SPEC Optical Sorter, equipped with sensor, leading the industry in identification capabilities.
- Identification of plastics, paper, and textiles in 256 spectral bands.
- Clear identification of PC, PVC, PETG, PP, PE, and composite materials, ensure that the product's impurities do not
  exceed the standard.
- Sorting paper, such as corre
- pers, kraft paper, egg

Weight Sorting Accuracy

Operating Voltage

```
Applications
```

PET PP container

Low Value Recycl

• Material Recovery Facilitie



	206	286
I	2000mm	2800mm
	13kw	14kw
	4400kg	5000kg
≥99	.6%	

#### Configurable to meet varying electrical requirements in different countries

fer to the actual equipment for accuracy. Sorting accuracy may vary due to differences in incoming materials.

- Paper Waste
- Textiles

- Commercial Waste
- Industrial Waste
  - Organic Waste
- Mixed Household Waste
- Construction and Demolition Waste

Medical Plastic Recycling

Electronic Waste





### Al Optical Sorter FASTOAI - FLUO®

#### Before Crushing, Fluorescent and Aging Bottles Can Be Separated.

- Equipped with the industry's first 'laser line scanning camera」 and 'fluorescent sensor」, providing a unique advantage over competitors
- At the whole-bottle process, separated aged bottles, faintly fluorescent bottles, and fluorescent bottles that are imperceptible to the human eye, ensuring the quality of the back-end bottle flakes.
- Equipped with AI identification system, not only simultaneously separate oil bottles, self-adhesive label bottles, bottles with residual labels, and mixed color bottles, but also saving on labor costs.
- FASToAi·FLUO®——Quality management expert that provided exceptional Identification to establish "Dark Factory" .

A		
Model	06	
Working Width	0mm	
Power	škw	
Weight	)0kg	
Sorting Accuracy	and the second	
Operating Voltage	Configurable	_

6
mm
W
)kg

\*The above data is for reference only; please refer to the actual equipment for accuracy. Sorting accuracy may vary due to differences in incoming materials.

#### Applications

- PET Bottle Sorting
- Bottle To Bottle Recycling
- Municipal Solid Waste
- Material Recovery Facilities





### • *FLUO*™

#### h 「Hyperspectral Camera」 And 「Fluorescent Sensor」

to improve product quality, detect that "cannot be identified by

ves, such as faintly fluorescent bottles, fluorescent bottles , oil al & various colors, soiled bottles, self-adhesive label bottles,

inspection process, reducing labor costs. stablish "Dark Factory."

146	206	286			
0mm	2000mm	2800mm			
kw	14kw	15kw			
00kg	4600kg	5000kg			
≥99.6%					

ring electrical requirements in different countries

accuracy. Sorting accuracy may vary due to differences in incoming materials.





#### Mixed plastic flakes sorter



#### **Expert in Crushing and Sorting Mixed Plastic**

- Capable of sorting various materials without washing, with capacities of 2 to 8 tons per hour.
- Equipped with a 256-band hyperspectral sensor to sort PP, PE, PC, PVC, PET, PA, PMMA, ABS, and hundreds more.

• Food Container Fragments • Blister Sheet Crushed Material

• Suitable for automotive, construction, industrial, and household plastics, No matter how large or mixed the materials are.

#### Applications

- PE Shredded Material
- Automotive Plastics
- PP Crushed Material
- Bulky Household Waste

- Industrial Plastics
- Construction Plastics and more

#### **Application size**

#### 20mm-80mm







### FASToAi · SPEC · AiR

#### Innovative aerodynamic design

- Innovative aerodynamic design of the whole machine, specialized in lightweight materials sorting.
- Active airflow and high-speed conveyor belt synchronization, to ensure uniform, flat and stable material delivery
- The new type of catching bin can achieve the optimal flight path of lightweight materials, reducing floating and turbulence.
- Running speed up to 4.2m/s, 50% higher processing capacity.

### Ensuring high quality and high processing capacity in the sorting of paper and film

- Accurate identification of material, color and type with AI+SPEC hyperspectral recognition system
- Reduction of lightweight materials wrapping and dragging, minimizing material mis-selection and loss.

#### Applications

Milk flexible packaging (food-grade), edible oil flexible packaging (food-grade), aluminum-plastic composite flexible packaging (can be sorted by brand), other plastic bags, plastic film, industrial waste, construction and demolition waste, wrapping film, bags, etc. in mixed household waste.

#### Application size: 50mm-500mm

#### Conveyor belt velocity: 4.2m/s







### **PiCKiNG · EASY®**

PiCKiNG·EASY<sup>®</sup> is an AI heavy-duty sorting robot arm by DataBeyond, autonomously identifies and removes large-sized meterial, such as wood, plastic, woven bags, fabrics, foam, metal, shoes, etc. effectively reducing manual labor intensity and achieving optimal performance when integrated with DataBeyond optical sorter.

• Heavy-duty and Long-Travel Anti-collision Robot.

• Seamless analysis of sorted products, enable the digitization and visualization of the entire sorting process, making the future plants even smarter.

• Over 99% Sorting Accuracy

#### Applications

Construction and Demolition Waste Sorting
 Bulk Waste Sorting

Model	PiCKiNG·EASY S3	PiCKiNG·EASY S2	PiCKiNG·EASY S1
Number of Robots	One-to-one	One-to-one	One-to-one
Maximum sorting Range	2000mm×2000mm	2000mm×2000mm	2000mm×2000mm
Maximum Sorting Weight	5kg	10kg	20kg
Power	8kw	14kw	18kw
Sorting Accuracy	≥99%		
Working Voltage	Configurable to meet varying electrical requirements in different countries		

\*One-to-one means one central processing unit (CPU) controls one robot; it can be designed as one-to-two, where one CPU simultaneously controls two robots. \*The above data is for reference only; please refer to the actual equipment for accuracy. Sorting accuracy may vary due to differences in incoming

materials.

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### **IQC Line Of Plastic Bales**



Highlight :

#### System list :

After completed IQC, the system automatically generates of IQC reports and sends to finance and related staff.

### **Overall Solution Design and Construction**

### Zhejiang Quzhou rPET "Dark Factory"

#### We can offer you expe suitable solutions:

- Complete Factory Process Dia
- Factory-wide Power Calculati
- Logistics Planning for The Ent









### **Overall Solution Design and Construction**

Fully Automated Digital sorting line for MRF, Tianjin, China



Address:Hujiayuan Street, Binhai New District, Tianjin Annual Capacity:20,000 tons. Delivery: yes



### **MRF Digital Display Platform**

### **Digital Twin System**

The digital twin system, comprising physical and digital spaces with virtual-physical interactions, greatly enhances the automation and control of MRF, covering weighing, unloading, sorting, and packing. It allows comprehensive monitoring of production and equipment performance to ensure product quality.

### Intelligent Settlement System

The system includes smart weighing, impurity deduction, and settlement features. It can trace delivery vehicle details, driver information, recycling station locations, waste types, weights, delivery frequency, and rankings. This system integrates with ERP systems for seamless invoicing and financial confirmation.



### **MES Of Plastic Flakes Washing Plant**

Eliminate Management Loopholes to Ensure Leading-edge Performance

Incoming materials management

QC management

Sorting management

#### **Functions of MES**

- Historical data query
- Production data & schedule progress visualization
- System alarm and troubleshooting
- Real-time monitoring of material process
- Data display on Web and phone App end
- Seamless connection between MES and ERP system

#### **Applications**

- PET Flakes Washing Plant
- Chemical Fiber Plant
- Waste Collection center

- MRF
- C&D Waste Plant
- Paper Waste Plant

#### **Bottle Flakes** Washing management

Shipping management



### **Test Center Invest in Equipment with more Confidence**

Before investing in equipment, be sure to find the sorting solution that best suits your factory. DataBeyond Dongguan Testing Center has a full range of intelligent sorting equipment, including optical sorters with various sorting functions, intelligent sorting robots, and other separaters. To provide you a visual understanding of the sorting capabilities of our machines , we have integrated these high-end intelligent equipment into a complete production line.

Together with our material experts and engineers, we help you find the best solution for your material recovery and sorting tasks. You are also welcome to visit our testing center and participate in the material testing process with us.

We provide you complete picture of DataBeyond's intelligent sorting equipment, covering processing capacity, sorting accuracy, reject rate, one-click material switching, quick setting of sorting recipes, and more. Based on this testing data, we will tailor a sorting solution that best suits your factory.

Our customer-focused testing services are free of charge. By using DataBeyond's material testing services, you can reduce the risks of investing in equipment, validate the sorting process, and ensure that the equipment you invest in is the best choice for your needs.

Due to diverse classification requirements from our clients, DataBeyond's Testing Center is the only facility in China that integrates various advanced sorting equipment, including AI optical sorters, AI hyperspectral optical sorters, whole-bottle fluorescence aging machines, AI material color fluorescence 4D optical sorters, and AI sorting robots. This comprehensive testing center is designed to offer personalized solutions tailored to meet your needs.

If you are unable to visit the testing center, we can conduct material testing according to your requirements and provide you with detailed test reports and complete testing videos.

#### $\bigcirc$ **Free Consultation**

we can offer you expert advice and provide the most suitable solutions.

#### R All-round services

We commit to 365 days of sorting technical support

## **Services**

Installation,

#### **Debugging, and Training**

We have professional technical service engineers to provideequipment installation and debugging.



### Y.

#### **Free Testing**

**Customized** 

Return

You can provide sample materials, and our professional testing engineers will offer testing services for you.

#### Ê on Investment Analysis

We can offer you a Return on Investment(ROI) analysis, assisting you in making informed investment decisions.



# DataBeyond, Deserving of Your Trust!

#### **Extensive Experience**

With thousands of successful cases in automated sorting of recycled resources, we have accumulated extensive experience. We are not just your equipment supplier but also a partner you can trust. In the waves of technological advancement, we accompany you and your business in mutual growth.

#### **Our Values**

Our core principles and values: honesty, efficiency, integrity, and responsibility. In our actions, we work efficiently within an atmosphere of open and honest communication. In our thinking, we adhere to the right path, never resorting to unscrupulous methods. We approach every customer, regardless of size, with a sense of responsibility and commitment.

#### We Stay Focused

Since 2006, our team has consistently focused on the research, development, and commercialization of robotics and intelligent equipment. We are a top-notch professional team in the field of intelligent equipment and a partner you can trust.

Focused Sorting

# Leading

#### **Top Investment Institutions**

With a professional technical background, strong productization capabilities, and rapid market share, we have gained the trust of top investment institutions such as Legend Capital, Fortune Venture Capital, Sequoia China, and others. Our financing amount has reached several hundred million dollars.

#### **Mission and Vision**

All our actions align with the company's mission and vision—leading the global popularization of high-end intelligent sorting technology. We aim to make advanced intelligent sorting equipment accessible and beneficial for more recycling resources enterprises.

#### We are DataBeyond

Our Chinese name 弓叶 is not just our name but also our commitment to society.

"弓" (bow) signifies a balance of tension and relaxation, a constant focus. It represents our dedication not only to the growth of our company but also to the happiness of our employees' families.

"叶"(leaf) symbolizes that, no matter how powerful we become, ultimately, like leaves returning to their roots, we must give back to society.

