SEA

ELECTRONIC SORTING

SEA NEXT

SEA CHROME

CONVEYING | DRYING | SEED PROCESSING | ELECTRONIC SORTING | STORAGE | TURNKEY | SERVICE

CIMBRIA

PROGRESS
NEEDS PASSION
FOR DETAILS

STATE-OF-THE-ART TECHNOLOGY

Many years of experience has made Cimbria SEA a leading supplier of electronic sorting technology. Our strong market position is a result of almost 50 years of knowhow within development and production of optical electronic colour sorting equipment. This enables us to offer innovative and flexible sorting solutions based on a technical experience and a strong concept.

The SEA colour sorters are the state-of-the-art technology where traditional advantages have been improved with the most advanced technology, whilst maintaining simplicity of use.

NON-FOOD APPLICATIONS

PLASTIC MATERIALS
(GRINDED OR GRANULES)

The SEA sorters are the result of almost 50 years experience in the optical sorting field, and represent nowadays a benchmark for many operators in the plastic industry.

The SEA optical sorters allow recovery of products with the highest added value by controlling granules quality after the extrusion process and by separating non-conforming products (burnt and spotted fractions, etc.).
The SEA sorters are also used for sorting grinded plastic, flakes or granules based on differences in color, opacity and transparency.

Some typical examples of sorting applications are plants recycling PVC window profiles, PET bottles, hdPE, WEE, colored plastic materials and other plastics (refrigerators), car scraps (Abs, Pmma, Pc, Pp, etc.), production scraps, etc.

The SEA sorters grant high productivity and simultaneous product resorts with the highest optical precision and an efficiency between 99% and 99,99%, depending on characteristics of product.

The availability of monochromatic, double-camera or trichromatic configurations, the use of the latest technologies into visible, NIR and InGaAs frequencies, combined with LED broad spectrum lighting, allow SEA sorters to have an optical resolution of 0.1mm and to offer the best optical sorters available on the market.

MINERALS

SEA sorters are perfect solutions for mineral working plants for sorting materials with granulometry between 0,1 and 25mm. SEA sorters analyze product into free fall with customized cameras, exploiting the latest technologies into visible, NIR and InGaAs frequencies which, combined with LED broad spectrum or neon (depending on models), allow to achieve an optical resolution of 0.1 mm.

The most precise ejection system and the possibility of simultaneously rejected resorts leads to minimum rejects.

Mechanical design and particular accuracy into preventing machine from wearing and external agents influences, make SEA sorters the most reliable and steady performance machines on market.

If a sorter is required for use on corrosive products, special versions of the sorter can be produced in Stainless Steel.

METALS

SEA sorters find a perfect application for sorting metals with granulometry under 15 mm.
Red, grey, yellow and black colours can be efficiently classified by using the ultimate SEA RGB technology.

Plastic materials

Minerals

Metals & others
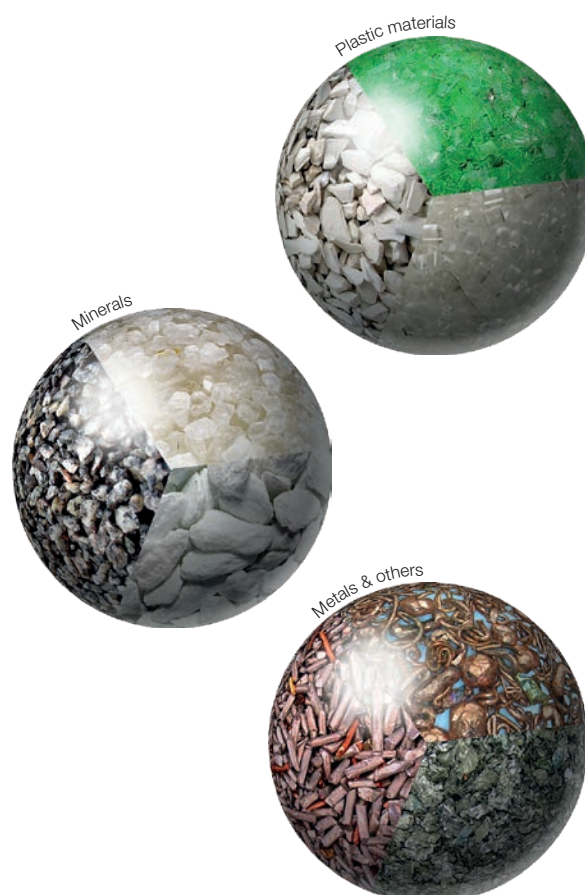
SEA NEXT

UP TO 7 CHUTES
To satisfy even the highest production capacities.

UP TO 28 CAMERAS FOR ANY OPTICAL CONFIGURATION
Up to 4 cameras per chute for monochrome, bi-chrome, NIR and InGaAs configurations, and with size control; 2048 Pixel CCD cameras allow the highest optical resolution for camera / inspection surface ratio (0.1 mm);
The optical system grants extreme flexibility in image processing, allowing the sorter sensitivity setting based on colour/transparency and dimension of the defects to separate;
The SEA Next CCD cameras have best possible signal/noise ratio.

LED RGB LIGHTING AND BACKGROUND
The full color RGB Led lighting system, exclusively designed for SEA, allows the most precise focusing of the beam on the inspection line;
Long lasting and reliability (over 100.000 h) and low heat dissipation.

ELECTRONICS – HARDWARE
The hardware is organized in easily replaceable electronic boards, using the ultimate SMD and FBGA technology;
Self-control functions, such as auto-diagnosis and auto-calibration are standard on any SEA sorters;
Back-up of the operating software by USB on board.
The high speed signal elaboration and communication to expulsion system allows an excellent performance.

WORKING PROCESS
1   Input product is loaded into the in-feed hopper,
2   it moves along the vibrating plate
3   until it flows on to a sloping chute where it is individually checked and sorted by state-of-the-art cameras
4   (CCD cameras for standard version and
5   additional cameras for bichromatic, NIR and InGaAs versions) situated in the front and rear of the flow.
6   Depending on the signals received by the optical device, the sorter software controls the pneumatic device,
7   which physically separates the unwanted products out of the conforming ones which naturally reach their discharging hopper.
8   The rejected products are instead deviated by a jet of compressed air produced by the relevant ejector and discharged in the front side hopper.

In automatic re-pass versions, the sorted or rejected product is automatically conveyed to another section of the machine for undergoing an identical process.

SEA NEXT SERIES

MODEL	NEXT 1	NEXT 1.5	NEXT 2	NEXT 3	NEXT 4	NEXT 5	NEXT 6	NEXT 7
CONFIGURATION								
VIBRATOR	1	2	2	3	4	5	6	7
CHUTE	1	1.5	2	3	4	5	6	7
CCD CAMERAS*	2 to 4	2 to 4	4 to 8	6 to 12	8 to 16	10 to 20	12 to 24	14 to 28
EJECTORS	54	77	108	162	216	270	324	378

*Number of cameras depends on configuration. It is possible to configure any model into monochromatic, bi-chromatic, NIR and InGaAs versions depending on different sorting requirements.

MODEL		NEXT 1	NEXT 1.5	NEXT 2	NEXT 3	NEXT 4	NEXT 5	NEXT 6	NEXT 7
DIMENSIONS	mm								
WIDTH		1560	920	1560	1560	1950	1950	2540	2540
DEPTH		1550	1715	1550	1550	1550	1550	1550	1550
HEIGHT		2100	2100	2100	2100	2100	2100	2100	2100
WEIGHT	kg.	655	660	705	735	845	955	1150	1200
POWER CONS.	kW	1.5	1.5	1.5	1.5	2.5	2.5	3.5	3.5
AIR CONS AT 4 BAR	l/sec	8.4	12.6	16.8	25.2	33.6	42.0	50.4	58.8

The dimensions and technical data herein mentioned are indicative and subject to changes. We reserve the right to change them at any time without prior notice.

SEA NEXT

SEA CHROME

SEA-CHROME PROVIDES THE BEST SORTING ACCURACY

1 TO 7 CHUTES
To satisfy any production capacities.

ULTIMATE FULL COLOR RGB CAMERAS
Front and rear optical system, composed by 4096 pixel RGB full-color cameras, allows to identify any defect at 360° perspective with a resolution of 0.1mm.
Defect size can also be controlled and adjusted according to needs.

SHAPE SIZING INTEGRATED INTO THE SYSTEM

LED-LIGHTING SYSTEM
Exclusively designed for SEA, LED lighting system allows the most precise focusing of the beam on the inspection line.

USER FRIENDLY SETTING WITH IMAGE ACQUISITION
Program setting and adjustment are performed through a user–friendly software which allows the acquisition of the product image to easily establish the defective elements to sort out.

SEA CHROME SERIES

MODEL	CHROME 1	CHROME 1.5	CHROME 2	CHROME 3	CHROME 4	CHROME 5	CHROME 6	CHROME 7
CONFIGURATION								
VIBRATOR	1	2	2	3	4	5	6	7
CHUTE	1	1.5	2	3	4	5	6	7
TRI-CHROMATIC CCD CAMERAS*	2 to 4	2 to 4	4 to 8	6 to 12	8 to 16	10 to 20	12 to 24	14 to 28
EJECTORS	54	77	108	162	216	270	324	378

MODEL		CHROME 1	CHROME 1.5	CHROME 2	CHROME 3	CHROME 4	CHROME 5	CHROME 6	CHROME 7
DIMENSIONS	mm								
WIDTH		1510	920	1510	1510	1920	1920	2470	2470
DEPTH		1690	1690	1690	1690	1690	1690	1690	1690
HEIGHT		2050	2050	2050	2050	2050	2050	2050	2050
WEIGHT	kg.	940	790	1000	1060	1240	1300	1490	1650
POWER CONS.	kW	1.5	1.5	1.5	1.5	2.5	2.5	3.5	3.5
AIR CONS AT 4 BAR	l/sec	8.4	12.6	16.8	25.2	33.6	42.0	50.4	58.8

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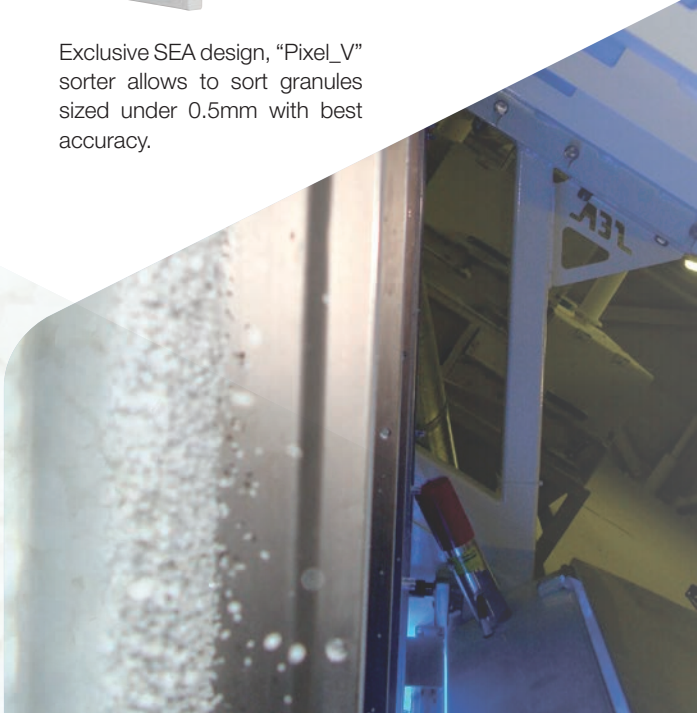
SEA CHROME

EUROPEAN
TECHNOLOGY
MADE IN ITALY

OUT OF STANDARD

Stainless steel version available for salt or other abrasive commodities sorting (option).

Exclusive SEA design, "Pixel_V" sorter allows to sort granules sized under 0.5mm with best accuracy.

SEA SORTERS MAIN CHARACTERISTICS

MODULAR STRUCTURE

Multiple channels configuration meet any production capacity requirement.

VERSATILE CONFIGURATION

Multiple and resort sorting passes set up make the SEA sorters extremely flexible.

UP TO 4 MULTI-SENSOR CAMERAS PER CHUTE

According to the application and model, the SEA sorters can be equipped with 2 to 4 cameras per chute. CCD cameras are exclusively designed for SEA sorters and even the monochromatic version is provided with 4 thresholds of sensitivity plus the size control of the defect.
In any SEA sorter, in spite of any configuration available (monochrome, bi-chrome, tri-chrome, NIR and InGaAs), the cameras always grant the highest optical resolution (0.1 mm) and the best possible signal/noise ratio.

LIGHTING AND BACKGROUND SYSTEMS

According to the application and the machine model, SEA sorters are equipped with custom RGB Led lighting system or neon lamps easy available on the international market.

ELECTRONICS – HARDWARE

The SEA sorter hardware is organized in easily replaceable electronic boards using the ultimate SMD and FBGA technology.
The SEA software allows self-control functions such as auto-diagnosis and auto-calibration as well as the back-up of the operating software.
The high speed signal elaboration and communication to expulsion system allow an excellent performance.

EJECTION SYSTEM

State-of-the-art ejectors guarantee most accurate precision and expulsion rapidity producing highly concentrated rejects.
Extremely fast ejectors are guaranteed for more than 2 billion operating cycles and they can easily be repaired or replaced.
The blowers are placed directly on the ejectors pneumatic lung.

15 INCHES COLOUR TOUCH-SCREEN DISPLAY

The Windows 7 embedded graphic interface assures an easy connection to company networks and to remote assistance systems.

MECHANICAL DESIGN

Pressurized and conditioned optical boxes.
Airtight structure prevents dust and product outflow.
Easy product sampling collection.
The folding optical boxes enable the full opening of the sorter, facilitating its cleaning and maintenance.
SEA sorters are provided with standard flanges for de-dusting systems; additional pre-arrangement for aspiration system is available as option.

OTHER

CE certification of conformity can be combined with ATEX 22 certification (option).

Customized color on request (option).

Tilting optical boxes

AFTER-SALES SERVICE

COMMISSIONING & PERSONNEL TRAINING

Cimbria SEA personnel performs these operations at customer's premises, providing a complete and detailed explanation on machine functioning. The customer's sorter operator will be duly trained during the machine start-up by one of Cimbria SEA's experienced technical engineers.

REMOTE ASSISTANCE

All SEA machines have the ability to be accessed remotely.
When needed, an operator can request an interactive control of the sorter though an internet connection. Cimbria SEA operators can control, modify and memorize the program data through a specific server.

ON-SITE SERVICE

Specialized Cimbria SEA staff or locally trained technicians carry out on-site services.

PROGRAMMED MAINTENANCE SERVICE

In many countries, Cimbria SEA offers a planned maintenance service to ensure periodic machine control at customer's premises, with fixed costs.

SPARE PARTS

Some wearing parts can be found locally in almost all Countries. The use and maintenance handbook, supplied with the sorter, contains a specific spare parts section indicating codes to be used for spare parts request to Cimbria SEA.

**YOUR PRODUCTS
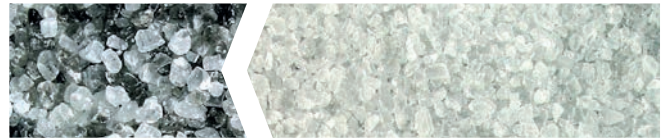OUR EXPERIENCE**

APPLICATIONS

REJECTED	SORTED	REJECTED	SORTED

hdPE

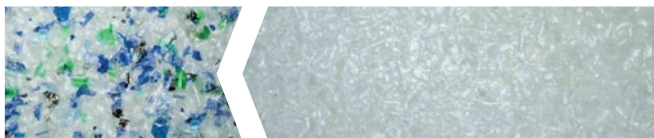Salt

Plastic Granules

Quartz

PET

Pyrite

PET

Granite

PVC

Copper-Aluminium

PVC

Copper-Aluminium

Testing centers available
in different countries for
industrial tests.

Best optical resolution –
Minimum rejects – High
production capacities

CIMBRA

A/S CIMBRIA

Faartoftvej 22
P.O. Box 40, 7700 Thisted
DENMARK
Phone: +45 96 17 90 00
holding@cimbria.com
www.cimbria.com

CIMBRIA S.R.L.

Via Colombarotto 2
40026 Imola BO
ITALY
Phone: +39 0542 361423
info@seasort.com
www.seasort.com

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