



# SEA ELECTRONIC SORTING



WHEAT & MAIZE MILLING  
SORTING PRESENTATION  
PIXEL NEXT

## The Company

**Company Name:**

SEA S.r.l.

**Year of Foundation:**

1970

**Staff:**

At present SEA has 34 full-time employees plus external resources. All staff members are high qualified engineers, technicians and administrators.

**Business Activity:**

SEA designs, produces and sells ELECTRONIC SORTERS

**Headquarters:**

**Via Colombarotto,2 - 40026 Imola (BO) – ITALY**

Website: [www.seasort.com](http://www.seasort.com)

**NEW ADDRESS**

**Since May 2012:**

**Part of CIMBRIA Group**



About us: ***“Highly Dynamic Company  
with Dynamic People!”***

- ✓ Innovative, cost effective & technology driven solutions
- ✓ Consistent performance of high quality products
- ✓ Unmatched after-sales support
- ✓ Quick deliveries

## WHEAT Optical Sorting

In milling industry, many SEA sorters been installed at major **Durum and soft wheat mills** for the removal of **stones, glass, foreign seeds, disease and defective grains** such as mottled and shriveled ones, that are the cause of brown/black tips in the semolina/flour. **Excellent end-product safety and appearance of products** like flour, pasta and semolina is thus guaranteed.

SEA sorters also allow the **recovery of good broken wheat** granting the yield increasing, and quick return of the investment.

Very important application is the **insert of the SEA sorters in** strategic locations of the wheat **cleaning process** in order to simplify and optimize it.

Today the SEA brand stands more and more for the efficiency and the productivity of its optical sorters, for their versatility and reliability that are the wellspring on all models.

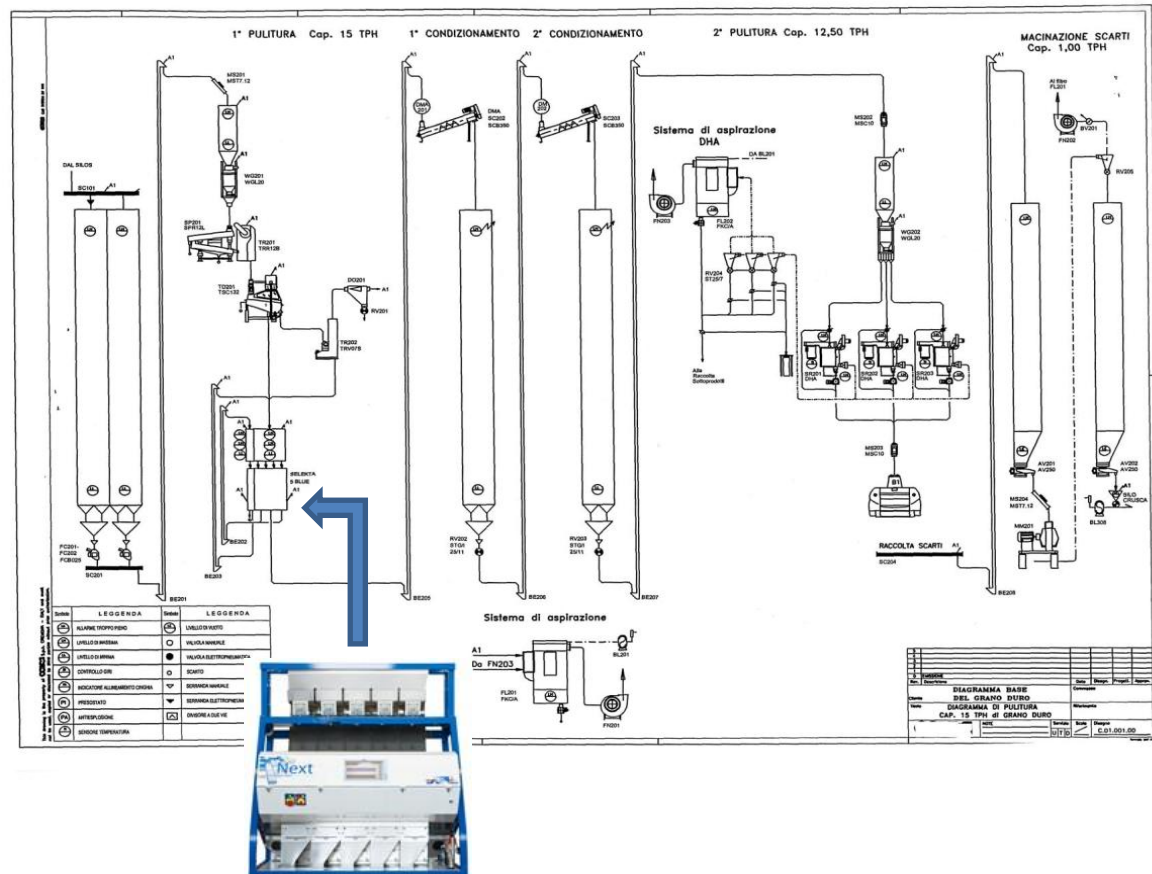
The “**Pixel NEXT**” series for grains includes **8** models to satisfy capacity requirements, ranging from **0.5t/h up to 50t/h**.

All models can be supplied with the re-pass section configured according to the client's needs.



## Positioning directly on first cleaning to replace the cylinders separation unit

Recent and very important application is the insert of the SEA sorters in the cleaning process, immediately after the de-stoner, in order to **simplify and optimize** it.



## Positioning directly on first cleaning to replace the cylinders separation unit.

The optical sorting concerns the whole production and, beyond the separation of foreign seeds, it also removes the defective grains such as **mottled** and **shriveled** ones that are the cause of brown/black tips in the semolina/flour.

**The use of the optical sorters SEA allows to optimize the cleaning process, to increase the yield (recovery of the broken grains) and at the same time to produce the best semolina/flour.**



The total mill rejects are reduced thanks to SEA optical sorter that keeps the broken good grains in the sorted stream, thus **the discards in cleaning phase are limited.**



## Installation in the second cleaning (before "B1")

The introduction of SEA sorters in the Durum wheat Mills **directly before the "B1"** allows the separation even more accurate of the mottled grains, coal grains, sick grains, strained grains, shriveled grains, vetches, and other foreign seeds which are the cause of black and brown spots in the finished product.

When **debranning** system is present, the optical sorter can find its location immediately after it.



Separation of **defective grains** (mottled and shriveled ones) and of **foreign bodies** (vetch, stones, soya, wood, etc.).

## Separation of grains affected by **FUSARIUM**

Optical sorting advantages get immediately evident in a neuralgic food processing field, as the wheat milling industry. Since some years the main trend is to equip and **integrate the traditional mechanical cleaning process of durum and soft wheat with optical sorting machines.**

The main purpose is separation of foreign seeds and bodies, as well as unhealthy kernels, such as mottled or carbonated grains, but in particular the separation of grains affected by **fusarium** (this element is really harmful and its presence over certain levels would make wheat unusable even for animal feed).

Laboratory analysis on flour and semolina (obtained after optical sorting) have evidenced that, apart from a more homogeneous color without black and brown spots (really appreciated in pasta production), **optical sorting allows a considerable reduction of bacterial and mycotic presence.**

The culture of optical sorting has quickly penetrate the wheat milling industry and today, apart from few exceptions, all diagrams foresee optical sorting application in the first cleaning phase.

**SOLUTIONS. TOGETHER.**





## MAIZE Optical Sorting

SEA has supplied its sorting machines to **maize milling factories** for maize flour for food purpose, to **get more beautiful and healthy flours**. Recently we entered the **maize dryers & storages market**.



ACCEPT



REJECT



## Wheat & Maize

DURUM WHEAT



SOFT WHEAT



MAIZE



HOMINY GRITZ



## The OPTICAL SORTERS – Operational Process

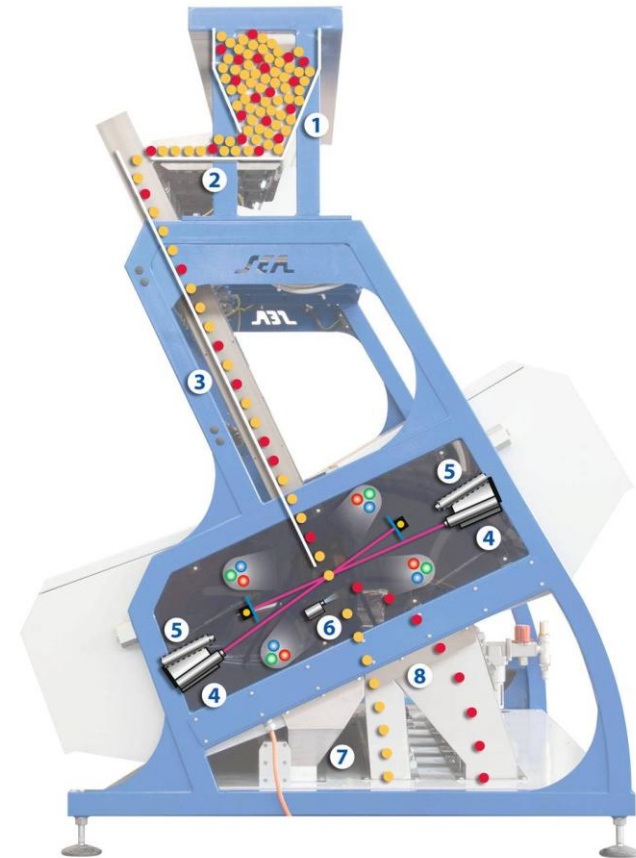
### Working Process

Input product is loaded into the **in-feed hopper** ①, it moves along the **vibrating plate** ② until it flows onto a **sloping chute** ③ where it is individually checked and sorted by state-of-the-art **cameras** ④

CCD cameras for standard version and ⑤ **additional cameras** for bi-chromatic, NIR and InGaAs versions) situated in the front and rear of the flow.

Depending on the signals received by the optical device, the sorter software controls the **pneumatic device** ⑥ which physically separates the unwanted products out of the conforming ones which naturally reach their **discharging hopper** ⑦.

The rejected products are instead deviated by a jet of compressed air produced by the relevant ejector and discharged in the **front side hopper** ⑧.

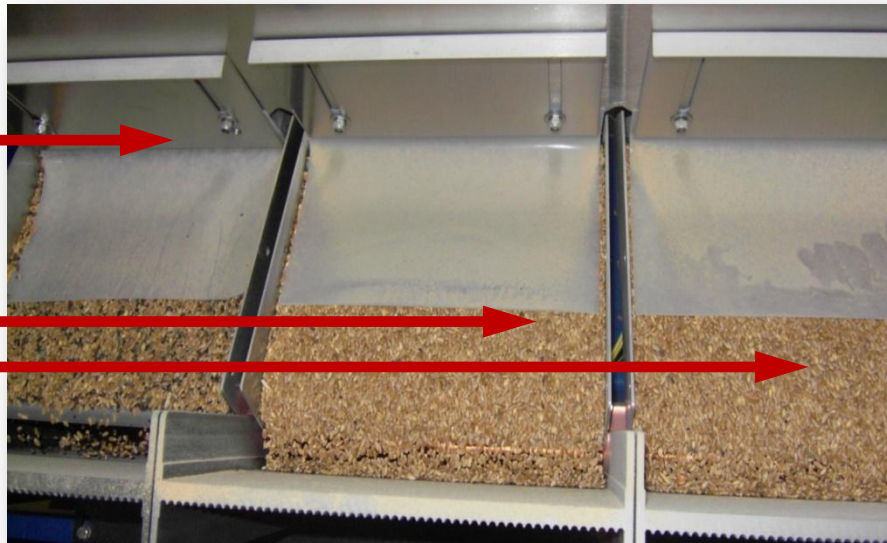


## Resort Configuration

Pixel NEXT sorters can be divided into **separate and independent sections** simultaneously working. The **second section** is used to recover the good grains rejected together with the contaminants during the section.

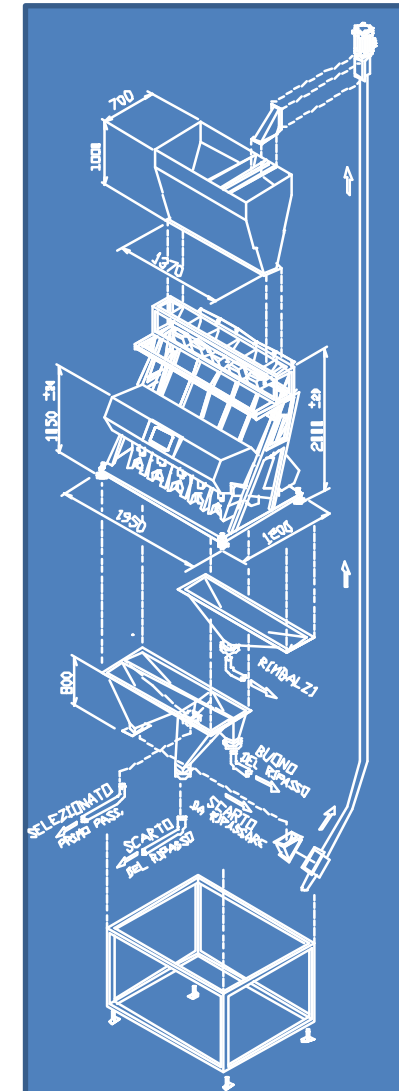
Section 2

Section 1



Standard is reject resort on the right hand. Upon request reject resort section is placed on the left side (see picture).

Resort configuration produces standard final rejects concentrated between **90% and 95%**



## Reject re-sort



4+1 configuration

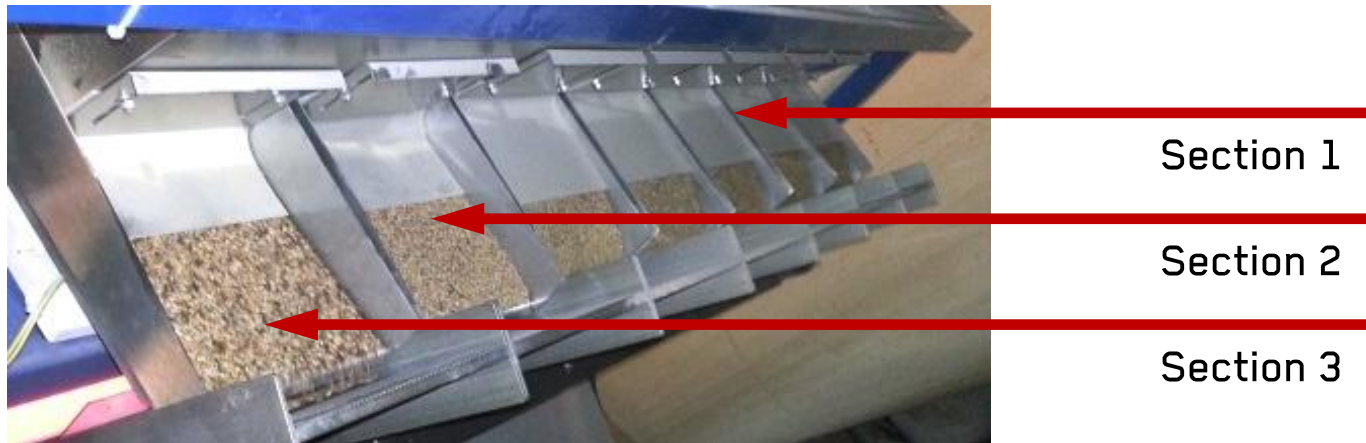


Three channels sorter configured in 2+1

## Reverse Sorting Configuration

Should the client desire to have a further concentrated reject, an additional chute of the machine can be used for further pass on the reject. The **REVERSE SORTING** consists in a **third section** of the machine working with **opposite sensitivity** (rejecting good grains out of not conforming ones).

Standard is reject resort on the right hand. Upon request reject resort section is placed on the left side.



Reverse sorting configuration produces standard final rejects concentrated at  $\pm 99\%$



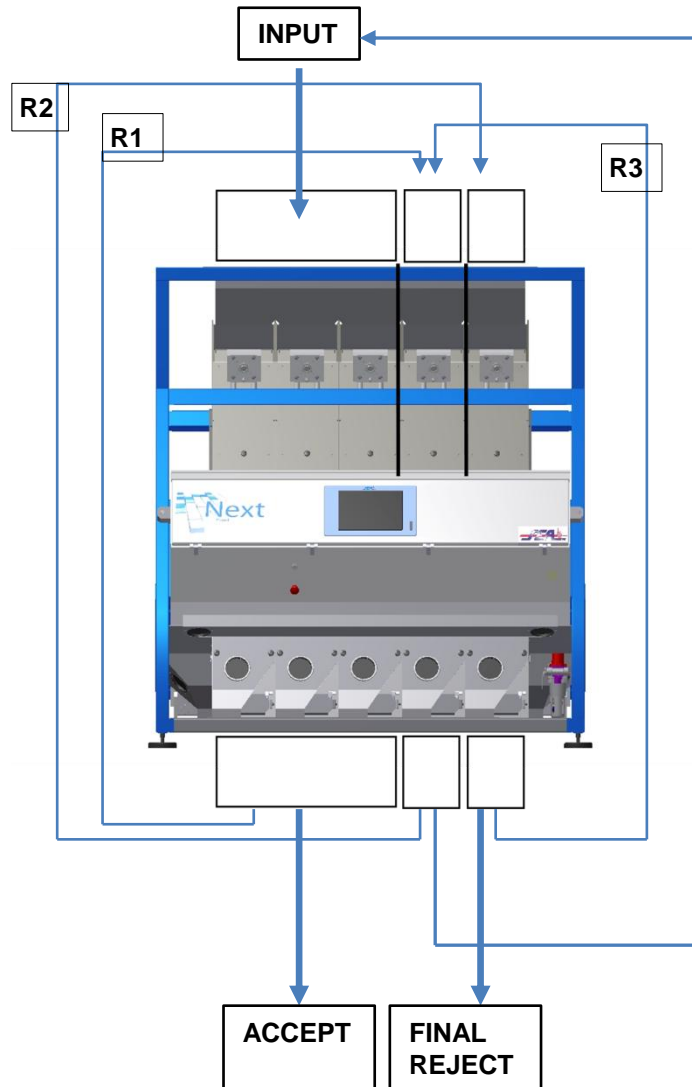
## Reverse Sorting



ACCEPT



FINAL REJECT



5+1+1 configuration



## Pixel NEXT Series - Models



<i>Models:</i>	<i>Dimensions (mm.) w,d,h</i>	<i>Electrical consumption*</i>	<i>Air consumption at 4 bar</i>
Pixel NEXT 1	1.560 x 1.550 x 2.100	1,0 kW	8,4 l/sec
Pixel NEXT 1,5	920 x 1.715 x 2.100	1,0 kW	12,6 l/sec
Pixel NEXT 2	1.560 x 1.550 x 2.100	1,5 kW	16,8 l/sec
Pixel NEXT 3	1.560 x 1.550 x 2.100	1,5 kW	25,2 l/sec
Pixel NEXT 4	1.950 x 1.550 x 2.100	2,5 kW	33,6 l/sec
Pixel NEXT 5	1.950 x 1.550 x 2.100	2,5 kW	42,0 l/sec
Pixel NEXT 6	2.450 x 1.550 x 2.100	3,0 kW	50,4 l/sec
Pixel NEXT 7	2.450 x 1.550 x 2.100	3,0 kW	58,8 l/sec



## Pixel NEXT Series – Main Characteristics

### Up to 7 chutes

- To satisfy even the largest production capacities;
- Flexibility with **multiple sorting pass** configurations.

### LED RGB lighting and background system

- **Full colour RGB Led**, exclusively designed for SEA by one of the most important manufacturer on market, allowing precise focusing of the beam on the inspection line;
- Long lasting and reliability (up to 100.000 h) and low heat dissipation.

### Up to 28 cameras for any kind of optical configuration

**Up to 4 cameras per chute** for monochrome, bi-chrome, NIR and InGaAs configurations.

### 2048 Pixel CCD cameras

The **highest optical resolution** for camera/inspection surface ratio (<**0.1mm**)

### Groundbreaking hardware

The high speed signal elaboration and communication to expulsion system allow an excellent production performance.



### 15 inches colour touch-screen display:

The **Windows XP embedded** graphic interface assures an easy connection to company networks and to remote service centers.

## Mechanical design

- Airtight structure to avoid dust and product loss;
- High functionality of product sampling collection;
- Provided with standard flanges for de-dusting systems;
- Additional pre-arrangement for aspiration system available (option)

## Rotating optical boxes

- The **folding optical boxes** enable the full opening of the sorter, facilitating its cleaning and maintenance;
- Optical boxes are pressurized and conditioned.

## Vortex cooling system

**Any model** is equipped with cooling system in the optical boxes

## Automatic cleaning system

A brush activated by a piston cleans the glass protecting the optical sensors: the continuous proper functioning of the machine is thus guaranteed.



## Simplified Handling

More than 40 years experience in colour sorting technology enables SEA to reach outstanding results with its **versatile** and **precise sorting machines**.

## Versatility

Up to **600 different custom-made sorting programs** available on board

## Microprocessor Control

**SEA-software** allows the use of **auto-diagnosis**, **auto-setting**, and the storage of the programs according to specific production requirements.

SEA engineers installing  
**"Pixel NEXT 7"** sorter SIDE BY  
SIDE the Buhler Sortex Z+  
at the biggest soft and durum  
wheat miller in Italy.



## After-Sale Service

**Commissioning & Personnel training:** We provide complete explanations on the sorter proper and most effective operation. Operator is duly trained during the commissioning of the machine.

**Spare Parts:** The wearing parts can be locally founded in almost every Country.

The use and maintenance handbook specifies spare parts codes to require to SEA.

**Technical Service:** SEA has highly skilled and multilingual technicians at disposal of its customers.

**Assistance:** In many Countries SEA offers a programmed maintenance service granting periodic controls at the customers' sorting installation at fixed annual fee.



**Free deal-up servicing  
through Internet!**

The dial-up assistance is the best guarantee of immediate and free interventions. Client's highest security in case of anomalies!

## Important details



### Capacitive sensors:

installed to control Minimum, Medium and Maximum level of product in the loading hopper



Optional: **RAL colour customization**  
upon request



# Installations



## SEA in Wheat & Maize Milling

Most of Buhler competitors prefer SEA sorters!



## Applications

**SEA** focuses on development and production of sorters applying **monochrome, bi-chrome, IR, UV, InGaAs, resonance, and other technologies**, being a **fundamental reference point for an increasing number of operators in different fields all over the world.**

In case of doubt on particular commodities or applications (feasibility, efficiency, etc) just contact us for **free-of-charge sorting tests** in our pilot plant station in Italy.



**Details:** SEA is proud to be the ONLY COMPANY in the WORLD offering electronic sorting solution for almost any dry commodity (food, seeds, minerals, and recycling)



## Past and Present



1970



1975



1980



1985



1995



1990



1999

## TODAY



MORE THAN 40 YEARS EXPERIENCE IN OPTO-ELECTRONIC SORTING TECHNOLOGY



# Waiting to welcome you

# in **IMOLA**



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