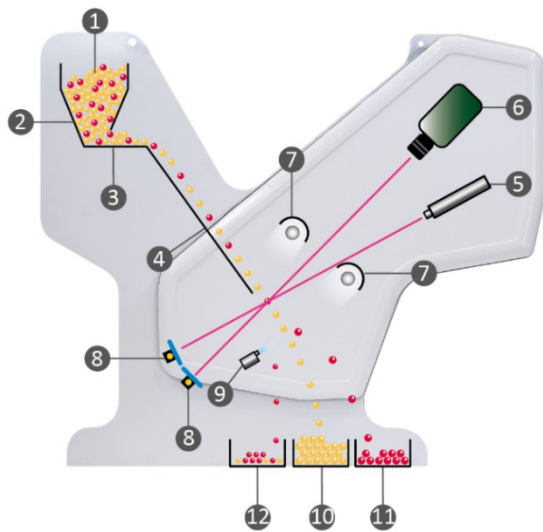**Optical Sorting**

SEA.HY

The Cimbria SEA.HY uses highly accurate hyperspectral sensors to identify different materials having the same color, allowing their separation according to their chemical nature.

PROCESS

1. Product to sort
2. In-feed hopper
3. Vibrating feeder
4. Feeding chute
5. RGB Full-Color camera
6. Hyperspectral camera
7. Lights
8. Backlights
9. Ejectors
10. Sorted flow output
11. Reject flow output
12. Bounce output

Grain Cereals Seeds Pulses Coffee Nuts Platics Metals
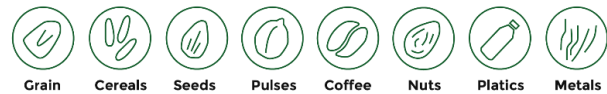
TECHNICAL SPECIFICATIONS

- Available in medium (M) and large (L) versions
- SEA.HY M has two chutes that can work independently for re-run processing
- SEA.HY L can be divided into up to four different sections allowing even complex resort diagrams

MECHANICS

- Airtight and pressurized optical boxes prevent from dust entering
- Automatic cleaning system
- The Vortex cooling system maintains an ideal temperature inside the optical boxes
- Built in ports for connection to the dust control system
- The air blade is installed in the rear as standard, while in the front side is offered as option, at need. This device removes dust and product residue from the optical boxes windows

EXPULSION SYSTEM

- **M** version has 126 ejectors
- **L** version has 252 ejectors
- Ejectors can be firing up to 1,000 cycles/s and are guaranteed up to 2 billion cycles

OPTICAL SYSTEM

- Driven by the need to solve previously impossible sorting challenges, Cimbria developed the SEA.HY series, a generation of sorters equipped with multispectral and hyperspectral imaging systems. Multispectral and hyperspectral (SWIR) cameras collect data from the electromagnetic spectrum, but unlike trichromatic cameras, which divide light into three bands, hyperspectral systems can divide light into hundreds of narrow bands over a continuous range that covers a large portion of the electromagnetic spectrum. They can collect hundreds of data points per pixel, which are combined to create a unique spectral signature. Backed by capable software intelligence, our hyperspectral sorter processes these fingerprints to allow for sorting on the chemical composition of the product
  - Scan rate: 2,000 scan/s
- The integrated Full-Color RGB cameras with 4096 pixels can identify the product by color. The system operates in the visible light spectrum very similar to what the human eye does
  - Scan rate: 18,000 scan/s
  - Optical resolution: 0.15 mm
- The software can manage up to 14 different families of defects
- Shape-size and defect-size controls are standard features of the sorter
- Active LED lighting and backgrounds

CIMBRIA

Optical Sorting

SEA.HY

USER INTERFACE

- 21,5" capacitive color touch screen for perfect visibility in low light conditions
- The user-friendly and multilingual interface allows very intuitive settings
- The HMI allows the simple product control for quick and easy recipe editing
- Main information and functions:
  - Machine status (vibrators and sensitivity on/off for each section)
  - Up to 200 recipes can be stored in the internal memory
  - Product level control in the hopper (sensors)
  - Real-time statistics and calculation of rejects per second
  - Alarms and indicators to identify any errors and restore the functionality of the machine
  - Total and partial counter
- Ethernet connection for real-time monitoring and on-line technical assistance
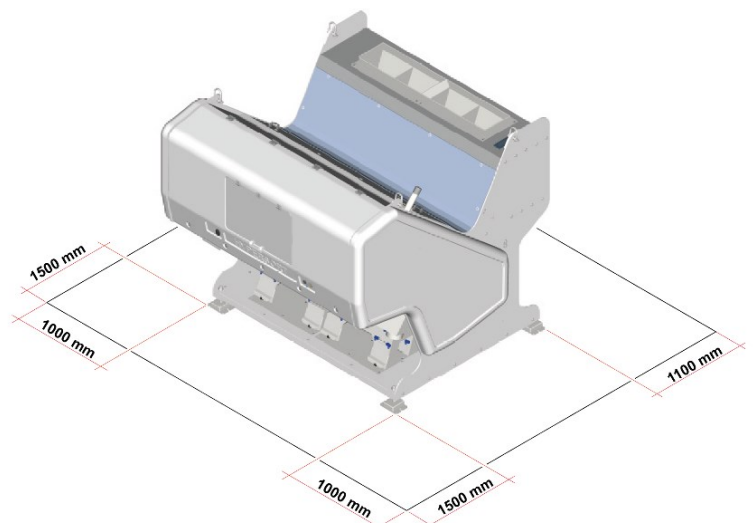
SEA.HY CONFIGURATION

Model	Setup
SEA.HY M	**n.1** hyperspectral **SWIR** camera **n.1** Full-Color **RGB** camera
SEA.HY L	**n.2** hyperspectral **SWIR** cameras **n.2** Full-Color **RGB** cameras

EXTERNAL EQUIPMENT REQUIRED FOR THE CORRECT WORKING*

- 230 VAC – 50/60 Hz single-phase power supply
- Voltage stabilizer (strictly necessary)
- Pneumatic system including rotary compressor, tank, filters and dryer
  - ISO 8573-1:2010 [5:4:3] for NON-FOOD PRODUCTS
  - ISO 8573-1:2010 [1.2.1] for FOOD PRODUCTS
- 1" minimum diameter air supply hose
- Supporting frame (Minimum one meter of free space each sides)
- Infeed and discharging hoppers (optional Cimbria supply)
- Product conveyors systems
- Fast internet connection

*Customer must provide and install the above

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Optical Sorting

SEA.HY

TECHNICAL DATA

- White RAL 9003 Standard (custom colors as option)
- Working temperature in workrooms min +5℃ max+35℃
- IP 55 protection
- CE conformity certificate
- 2006/42/CE on machinery safety
- 2014/30/CE on Electromagnetic Compatibility
- Compatible with UL and CSA standards

MACHINE TECHNICAL DATA

		SEA.HY M	SEA.HY L
Standard vibrating feeder		2	4
Chute width 300 mm for chute		2x300=600	4x300=1200
Hyperspectral SWIR cameras		1	2
Full-Color RGB cameras		1	2
No. ejectors/chutes		126	252
Compressed air consumption (max value at 6 bar)	l/min	700	1400
	m³/h	42	84
Compressed air hose	∅	1"	
Power supply/frequency	V/Hz	230 VAC – 50/60 Hz - 1 Ph (L + N + PE)	
Power consumption (max. value)	KW	1.2	1.8
Power absorption (max. value)	A	5.2	7.9

ASPIRATION SYSTEM

	SEA.HY M		SEA.HY L	
	m³/h	l/min	m³/h	l/min
Extraction	700	11667	1400	23333

* The user must ensure, near the intake vents, an air head equal to 150 mm H_2O.
**Minimum flow values required to the machine to process a highly polluted product

DIMENSIONS (mm /in)

	SEA.HY M		SEA.HY L	
	mm	in	mm	in
Length	1330	52,40	1960	77,20
Width	1980	78	1980	78
Height	1780	70,10	1780	70,10

WEIGHT (Kg /lbs)

	SEA.HY M		SEA.HY L	
	Kg	lbs	kg	lbs
Weight	970	2138	1250	2757

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