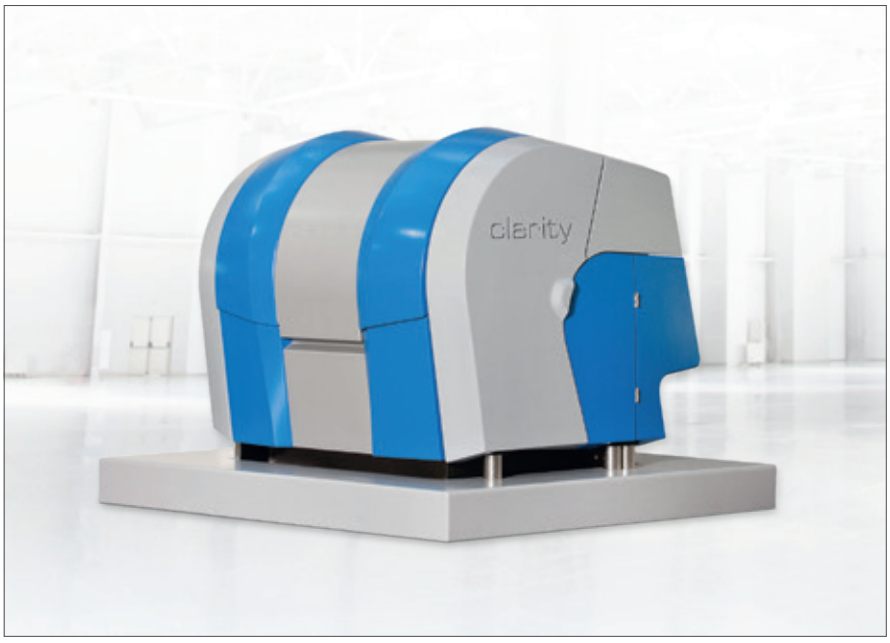
WE
SORT
IT
ALL

binder+co



CLARITY
HIGHEST QUALITY & VERSATILITY IN METAL SORTING

WE
SORT
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INTELLIGENT & CUSTOMIZED

Binder+Co will always adapt the sensor equipment of the CLARITY sorting systems to the individual applications. The available sensors range from color sensors, metal detectors, near-infrared spectroscopy to X-ray transmission and LIBS technologies.
The data from the installed sensors is combined and analyzed by means of specially developed algorithms. The sensor fusion allows, for example, simultaneous sorting by material type and color. If the feed material changes, CLARITY remains the ideal solution because multiple recipes can be programmed to respond to the changes.

ALL-ROUNDER

CLARITY is a true all-rounder in its applications. Depending on the task, CLARITY is equipped with the appropriate sensor technology.

The **VIS sensor technology** can recognize the finest color nuances and then classify objects. Thanks to high-resolution cameras, it is possible to identify objects in the millimeter range. That way, wire chops can be purified to 99.9+% quality by optical sorting.

NIR sensors ensure reliable and color-independent sorting according to material types such as polymers PET, polyolefins, PS, ABS, PVC etc. Wood, paper, PCBs etc. can also be detected and separated.

X-ray transmission (XRT) is used when materials need to be sorted by their atomic density. It is the only way to look inside non-transparent feed material to detect foreign material inclusions that are not visible from the outside. In addition, light metals can be sorted from heavy metals to produce a TWITCH concentrate (light metal pre-concentrate) from ZORBA, for example.

For reliable removal or recovery of metals, such as from ZORBA droppings, CLARITY can be equipped with a **metal detection system**. This detects metallic conductors by inductive sensor technology and thus guarantees the highest possible recovery rate of metallic recyclables in the process.

CLARITY
THE OPTIMAL SOLUTION FOR METAL SORTING

ALL-ROUNDER

In order to extract the maximum value from a metal pre-concentrate fraction (e.g. TWITCH), it is possible to further sort the material into alloy groups using the newly developed **LIBS sensor technology** (Laser Induced Breakdown Spectroscopy). CLARITY LIBS has been specifically designed for high throughput and tough industrial environments.

Due to the modular design of the CLARITY systems, it is also possible to integrate multiple sensors and use their information via multiple **sensor fusion** for advanced classification. In addition to the typical continuous inline application, this adds advantages especially in discontinuous batch operation. Thus, different sorting tasks can be solved with one machine, depending on which material needs to be processed.

Artificial intelligence (AI) makes it possible to accomplish tasks that were previously particularly challenging or impossible to solve. AI allows material-class-specific selectivities to be identified from image information that was previously unprocessable or invisible to the eye.

ACCESSIBLE & MAINTENANCE-FRIENDLY

The machine concept is designed to provide the highest degree of user-friendliness. In the design phase, special attention has been paid to quick and easy accessibility for maintenance and service.

All machines feature thoroughly designed safety concepts that have been optimized for practical use. The ionizing X-rays and the laser beams of the LIBS sensor system are completely shielded by the protective housing developed specifically for this purpose. During maintenance work inside the machine, it is automatically disconnected from the power supply.

24/7 WORLDWIDE

CLARITY sorting systems can be operated and diagnosed via remote access. This allows our customers worldwide to be supported quickly by our technicians at any time. With our service locations in Europe and the USA, we can be at our customers‘ site on short notice.

FUNCTION

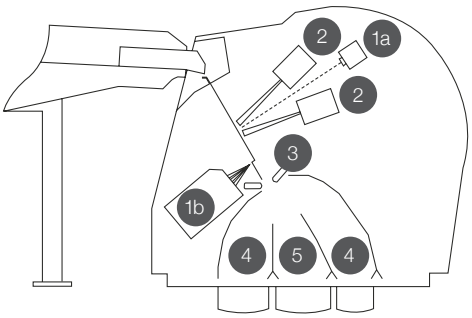
The **CLARITY chute system** is fed with a grain size of 0.8 - 100 mm. In this design, the material bed runs over a chute with an inclination adapted to the product. The feed material is singulated by this acceleration.

When CLARITY is designed as a **belt sorter**, an acceleration belt is used to convey the feed material to the lighting and detection unit.

CLARITY uses the design and positioning of the light source and sensor unit configured for the particular application to detect the necessary object properties in order to perform a meaningful classification based on differences in color, object size and shape, structure, material type, material density, as well as metal- and alloy-type.

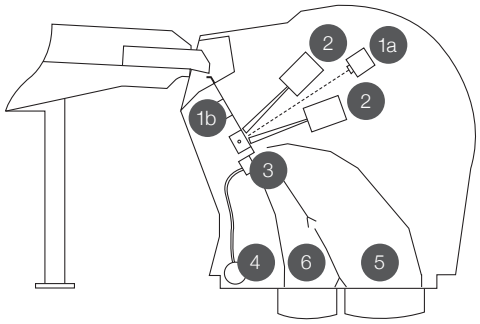
High-performance computers classify the feed material and calculate the optimum valve actuation parameters. The precision valves are activated at exactly the right time. Depending on the programmed recipes, contaminants and defined material classes are ejected by compressed air into the appropriate sorting paths. The sorting machine is equipped with the appropriate number of valves depending on the application and the granulometry of the feed material.

CLARITY LIBS VIS



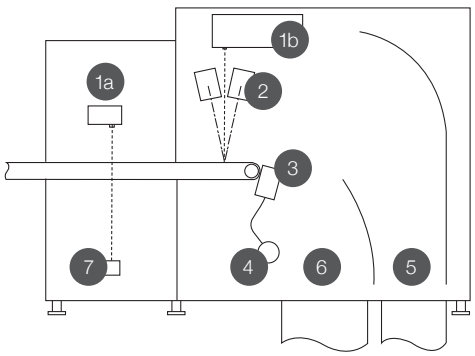
- 1a VIS sensor
- 1b LIBS sensor
- 2 lighting
- 3 sorting valves
- 4 ejection way
- 5 passing through

CLARITY VIS NIR



- 1a NIRs ensor
- 1b metal sensor
- 2 lighting
- 3 sorting valves
- 4 compressed air supply
- 5 ejection way
- 6 passing through

CLARITY XRT VIS



- 1a X-ray sensor
- 1b VIS sensor
- 2 lighting
- 3 sorting valves
- 4 compressed air supply
- 5 ejection way
- 6 passing through
- 7 X-ray source

METAL SORTING BY BINDER+CO

Worldwide resources scarcity, rising raw material prices and an increasing environmental awareness are the strong drivers of the Circular Economy. Metals are among the most important materials in daily life and are predestined for recycling. Almost all types of metal can be melted down an infinite number of times with little loss of quality.

Since the 1990s, sensor-based sorting of bulk materials has been a core competence of Binder+Co. The result is a wide range of solutions for configuring the optimum sorting machine for the most diverse tasks.

Precise separation - that is our expertise!

However, recycling only makes economic sense if it is carried out at a high level of quality. For the reuse of scrap metal, the different kinds of metal must be separated by type. With specialized sensors, the metals can be separated on the basis of their color differences, their electrical conductivity or their chemical composition. For this purpose, the CLARITY sorting systems are equipped with one of several available sensors or with sensor fusion.

The versatility of CLARITY:

- sorting of aluminum alloys and other base alloys (e.g.: iron base alloy)
- separation and sorting of metals from e.g. Zorba, radiator scrap, electrical scrap, ELV
- sorting of non-ferrous and gray metals
- separation of light and heavy metals
- sorting of copper and aluminum chops

RELIABLE CRUSHING

EFFICIENT SCREENING

WET PROCESSING

THERMAL PROCESSING

SENSOR BASED SORTING

BAGGING PALLETIZING

WE PROCESS THE FUTURE

binder+co

TECHNICAL DATA

CLARITY chute system				
sorting width	700 mm	1000 mm	1400 mm	2000 mm
typical capacity*	15 t/h	20 t/h	28 t/h	40 t/h
granulometry	0,8 – 100 mm			
sensors	VIS VIS FINE NIR LIBS (single and triple track systems) metal detection KI			

CLARITY belt system			
sorting width	1000 mm	1400 mm	2000 mm
typical capacity*	30 t/h	45 t/h	60 t/h
granulometry	1 – 250 mm		
sensors	VIS XRT (sorting width 1000 mm) metal detection (sorting width 2000 mm) NIR KI		

* depending on the respective task

CLARITY can be optimally equipped with different valve configurations for the individual tasks:					
distance between the valves in mm	3,125	6,25	8,33	12,5	25
option for a second row of valves		25 For alternately sorting of coarse and fine particles			25 for large and heavy material

Binder+Co AG, Grazer Straße 19-25, 8200 Gleisdorf, Österreich
Tel.: +43-3112-800-0*, Fax: +43-3112-800-300
office@binder-co.at, www.binder-co.com