Elica ASM presents

QUASAR

The Intelligent Optical Sorter

ASM®
advanced sorting machines
A Company of elica

www.elica-asm.com

ASM – The Italian Optical Sorting Machines from Bologna



For over 30 years, we have specialized in optical sorting, being at the forefront of sorting technology and meeting the highest standards of precision and quality in a wide number of applications

Brief history of ASM

Mr. Giovannini was a young and brilliant engineer when initially got exposed to optical-electronic sorting technologies since the 70's. In the following decades, while working at different companies, he successfully designed new generations of optical sorters, that unceasingly achieved a leap forward in innovation and quality.

He eventually met Mr. Mantovani and **in 2006** they started **a new company called ASM Advanced Sorting Machines**, producing together the first sorters series: the Futura Hybrid.

ASM has presently over 30 years of experience in the sorting technology.

At the beginning of 2015, ASM joined forces with Sesotec to form the Sesotec Group, which is one of the world leaders in the manufacturing of inspection, sorting and separation equipment.





ASM today part of Elica GROUP

In November 2020, ASM has been acquired by ELICA GROUP,
a leading supplier of installations for sunflower dehulling, grain cleaning, seed processing and equipment for handling of bulk materials
and it's now named **Elica ASM Srl**



Product Timeline



1996

RS (CSM company)



2006

Futura Hybrid



2009

Futura



2012

Vision



2014

Labseed



2018

Tigerbelt



2019

Quasar



2020

EUREKA



2021

PowTest

Our Products Portfolio

The MULTIPLE-CHUTES

Quasar series **Vision series**





Available in models from 1 up to 6 chutes
in iron painted or stainless steel version



Our Products Portfolio

The COMPACT one

EUREKA



The POWDER INSIGHT unit

PowTest



Available with «on table» configuration or mounted on a fitting cart-kit

Quasar

The Intelligent Optical Sorter



Quasar - Highlights



- ✓ Enhanced resolution and exclusive **color-cloud analysis**
- ✓ **True-shape technology** to differentiate objects and defects by size, shape and texture
- ✓ **Advanced SWIR** infra-red sensor as option
- ✓ Excellent sorting precision with **Sniper ejection logic**
- ✓ **New user-friendly HMI** allows program creation in a few minutes with automatic learning system
- ✓ **Comprehensive network interfaces**, useful for a prompt remote assistance support
- ✓ Reduced operation cost thanks to **optimized design**
- ✓ **Own** future-proof **software** development
- ✓ **Fully designed in Italy**

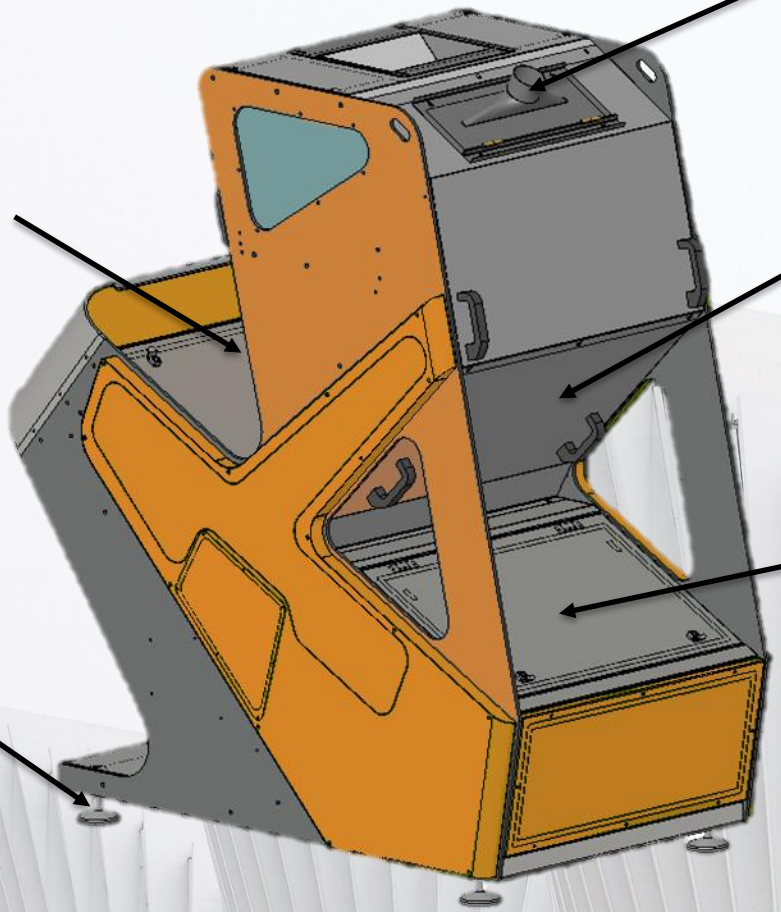
Dimensions

The Quasar series is available in 6 models, from 1 up to 6 chutes, to meet all production needs.

Model	Lenght	Height	Depth
Q 1000	897 mm	1910 mm	1821 mm
Q 2000	1370 mm	1910 mm	1821 mm
Q 3000	1672 mm	1910 mm	1821 mm
Q 4000	2070 mm	1910 mm	1821 mm
Q 5000	2416 mm	1910 mm	1821 mm
Q 6000	2820 mm	1910 mm	1821 mm

Available sensors configurations per chute
True-Color (2 cameras: 1 front + 1 back)
True-Color (1 front + 1 back)) + SWIR (1 front)
True-Color (1 front + 1 back)) + SWIR (1 front + 1 back)

Design elements



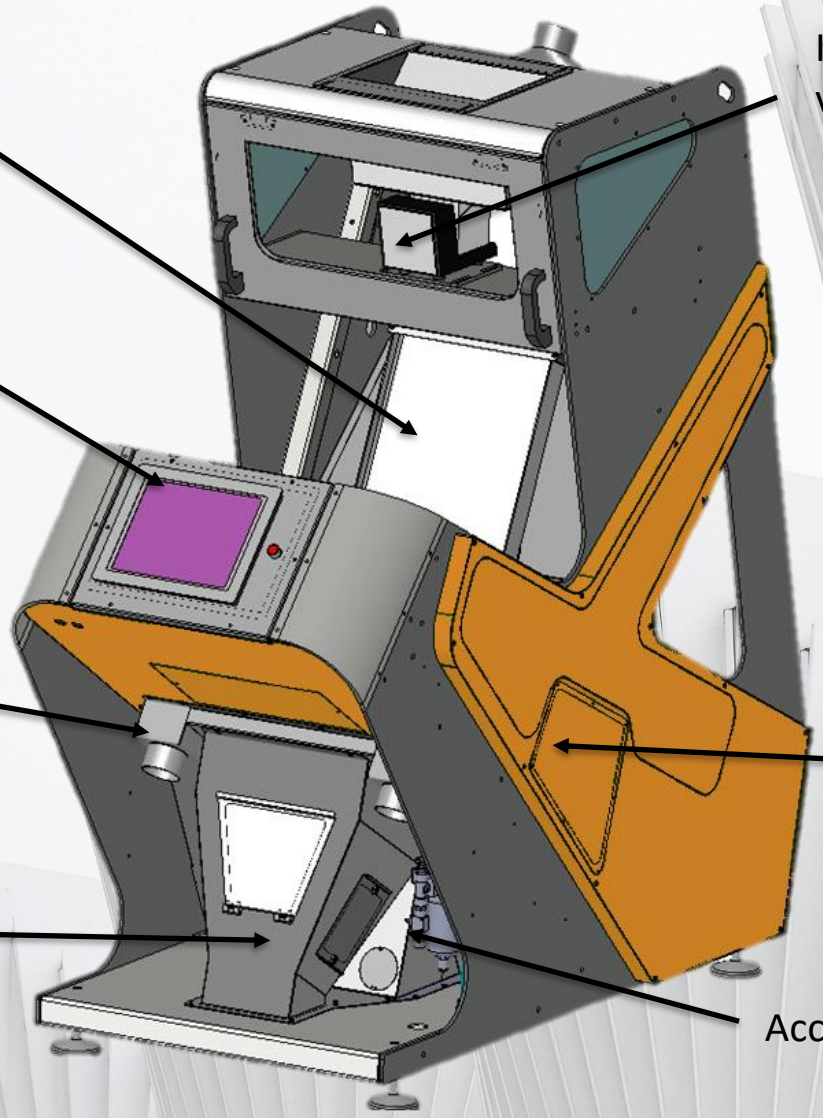
Dedicated attachments for vacuum system

Pressurized optical boxes rated IP65

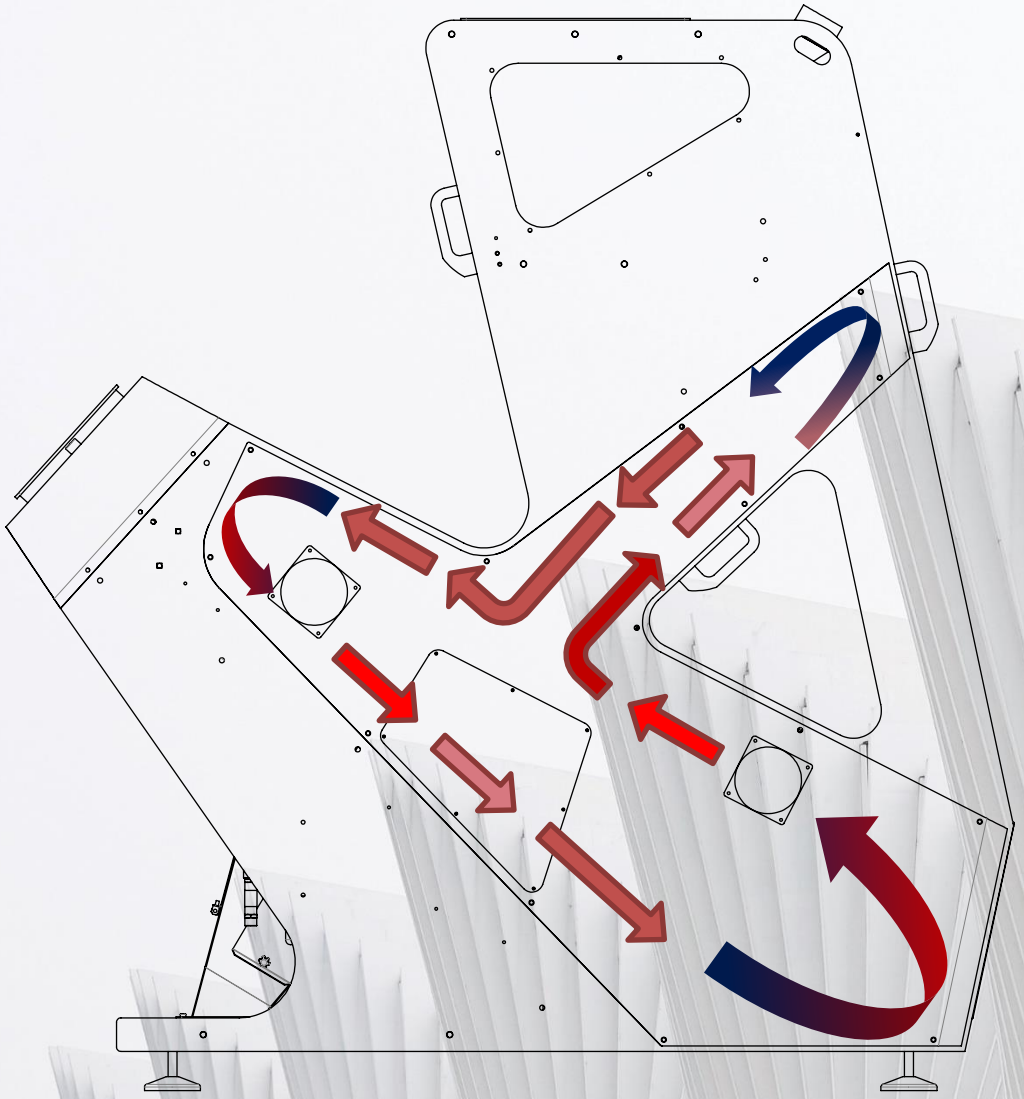
Shielding against ambient light

Pressurized optical boxes rated IP65. All optical and electronic components are protected

Adjustable feet to level the machine


360mm chute
Internal Input hopper & vibrating-feeder
Wide-screen HMI (tablet is optional)
Provisional attachments for vacuum system (for dusty products)
Inspection window allows easy access to ejector nozzles and optical glasses
Reject hopper
Accept hopper

Efficient internal cooling system



The Quasar **does not require additional cooling or heating systems.**

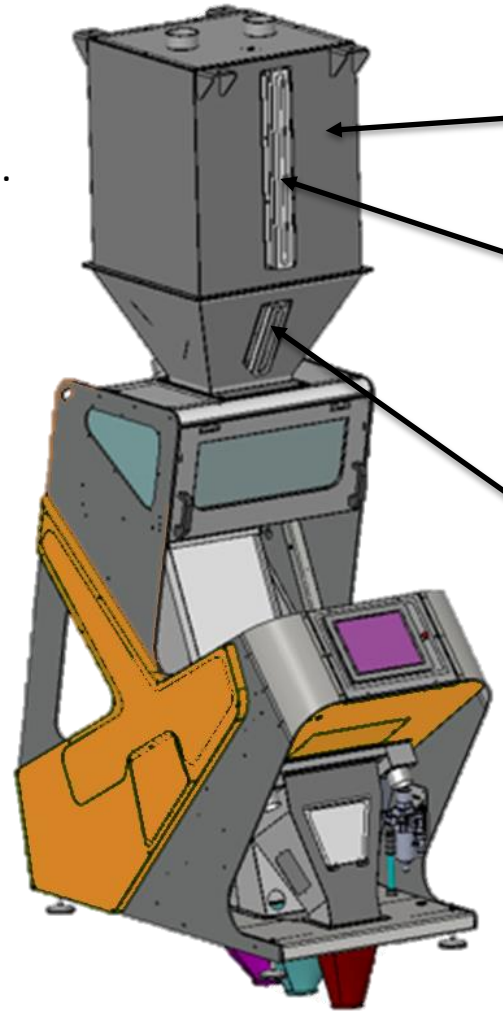
Low-noise fans circulate the internal air through the orange carters, which work as heat-exchangers.

There is no intake of external air, **avoiding the need for filters and the risk of dust entering the machine.**

The machine is rated IP65.

Input hoppers

The client must connect an input hopper to the top of the machine, and output hoppers to the bottom. There are no strict requirements regarding size and shape of these hoppers, so the client can adapt them to fit their installation.

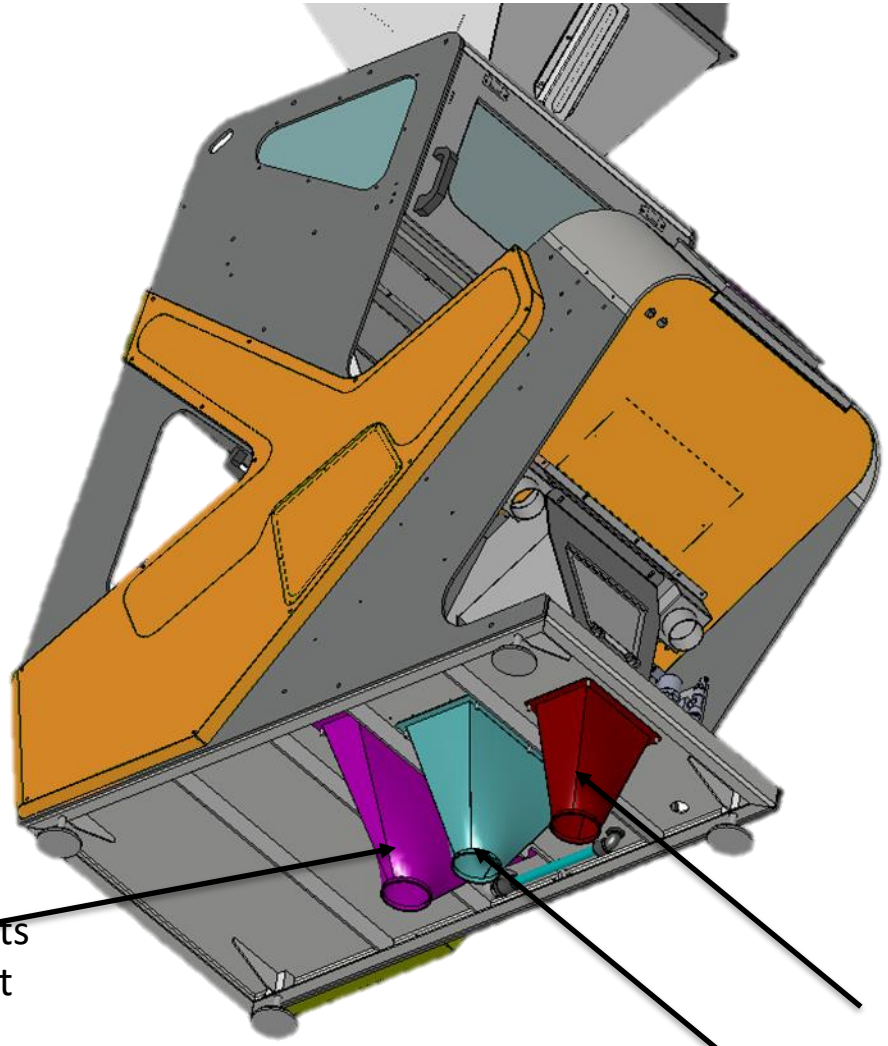


Additional buffer or silo (recommended)

Up to 3 level sensors can be connected to the machine for start/stop and to control throughput

Input hopper

Output hoppers

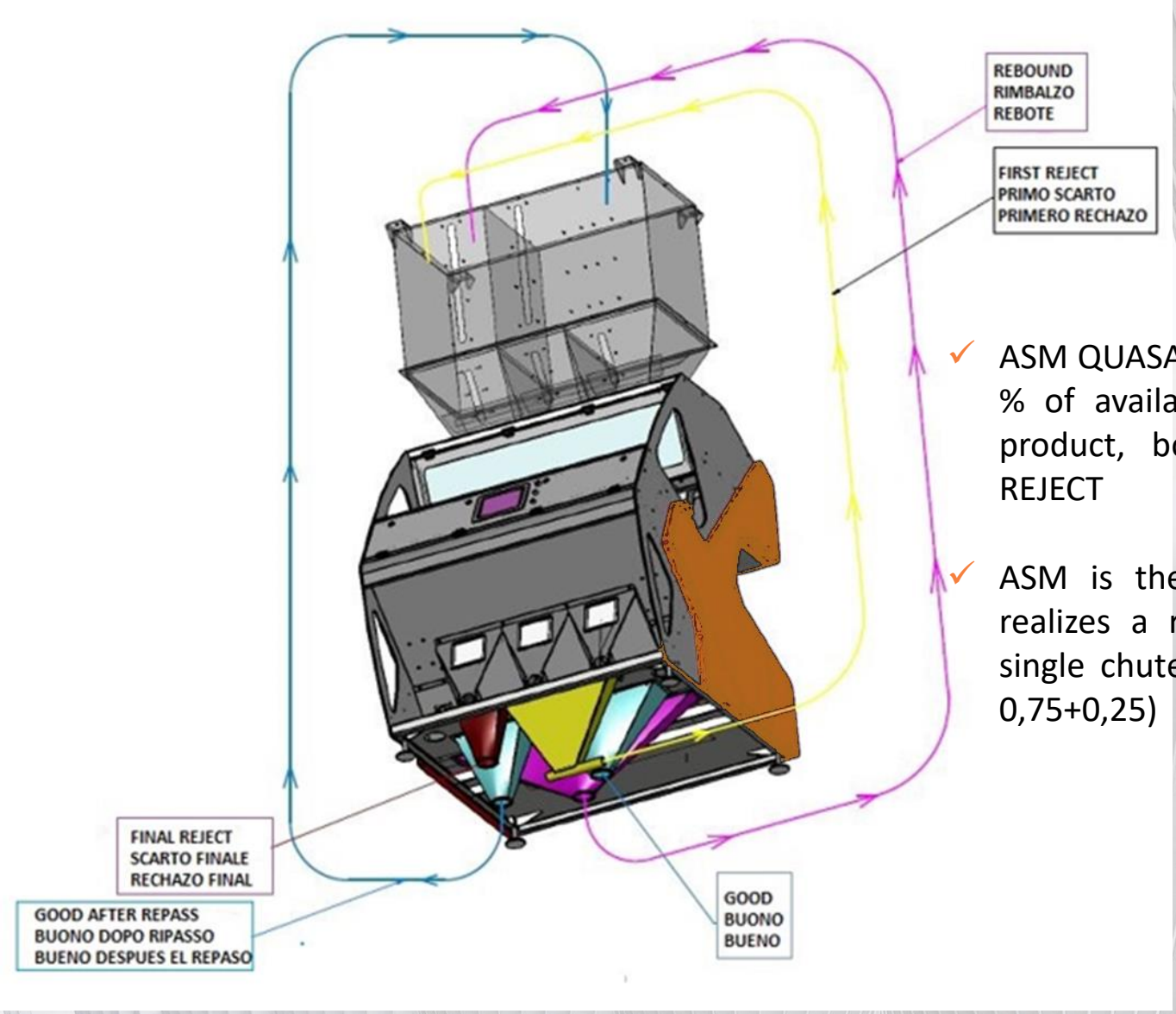


Rebounds hopper (collects product in case it falls out of desired trajectory)

Reject hopper

Accept hopper

Re-sort configuration



- ✓ ASM QUASAR is so flexible to reserve a % of available chutes to re-sort the product, both for ACCEPT and for REJECT
- ✓ ASM is the only manufacturer who realizes a re-sort fraction even in a single chute (configuration 0,5+0,5 or 0,75+0,25)

Vision system

TRUE COLOR cameras and SWIR sensor

TRUE COLOR cameras and SWIR sensor

TRUE COLOR cameras

- ✓ Optical resolution of 0.06mm
- ✓ Ultra-fast scan rate
- ✓ High-speed data transfer

Key benefits:

a camera that can see perfect colors, even if the product is very small (seeds 0,17mm)



SWIR sensor

- ✓ Twice the pixel resolution
- ✓ New optical box glasses for better infra-red transmission

Key benefits:

the new InGaAs can see FM and EVM with much higher accuracy compared to the older version





Smart Lighting, Increased reliability

Specially designed LED light projectors are:

- ✓ Collimated
- ✓ Polarized
- ✓ High intensity

Key benefits:

QUASAR uses less power,
which in turn means **less heat and longer service life** for both LEDs and electric boards



Examples of Infrared use



Fusarium disease in Cereals

Examples of Infrared use



Hulled/dehulled cereals

Examples of Infrared use



Cereals in cereals

Examples of Infrared use



Foreign material: plastic, wood, glass, rubber, paper, film

Examples of Infrared use



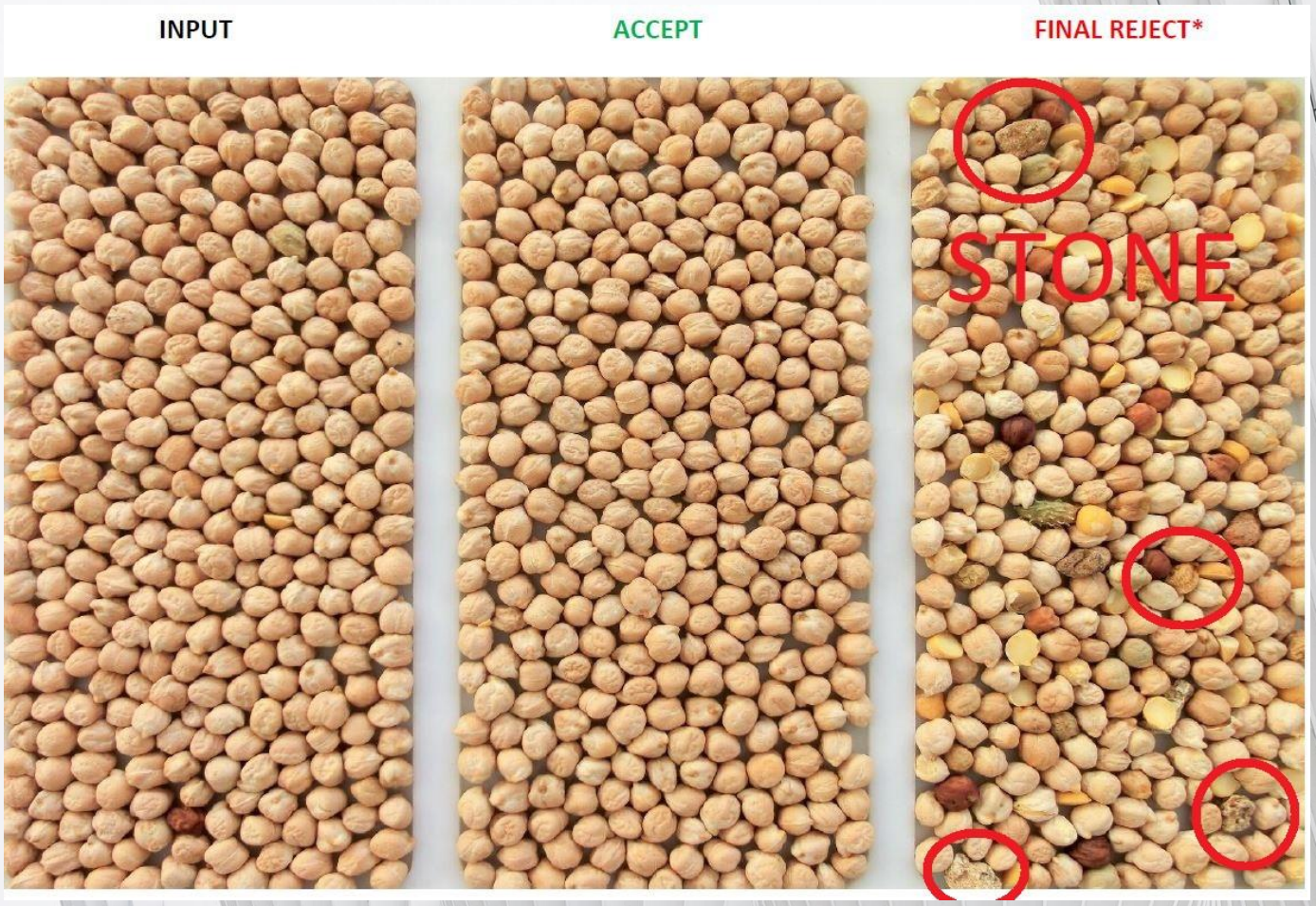
Shells in nuts

Examples of Infrared use



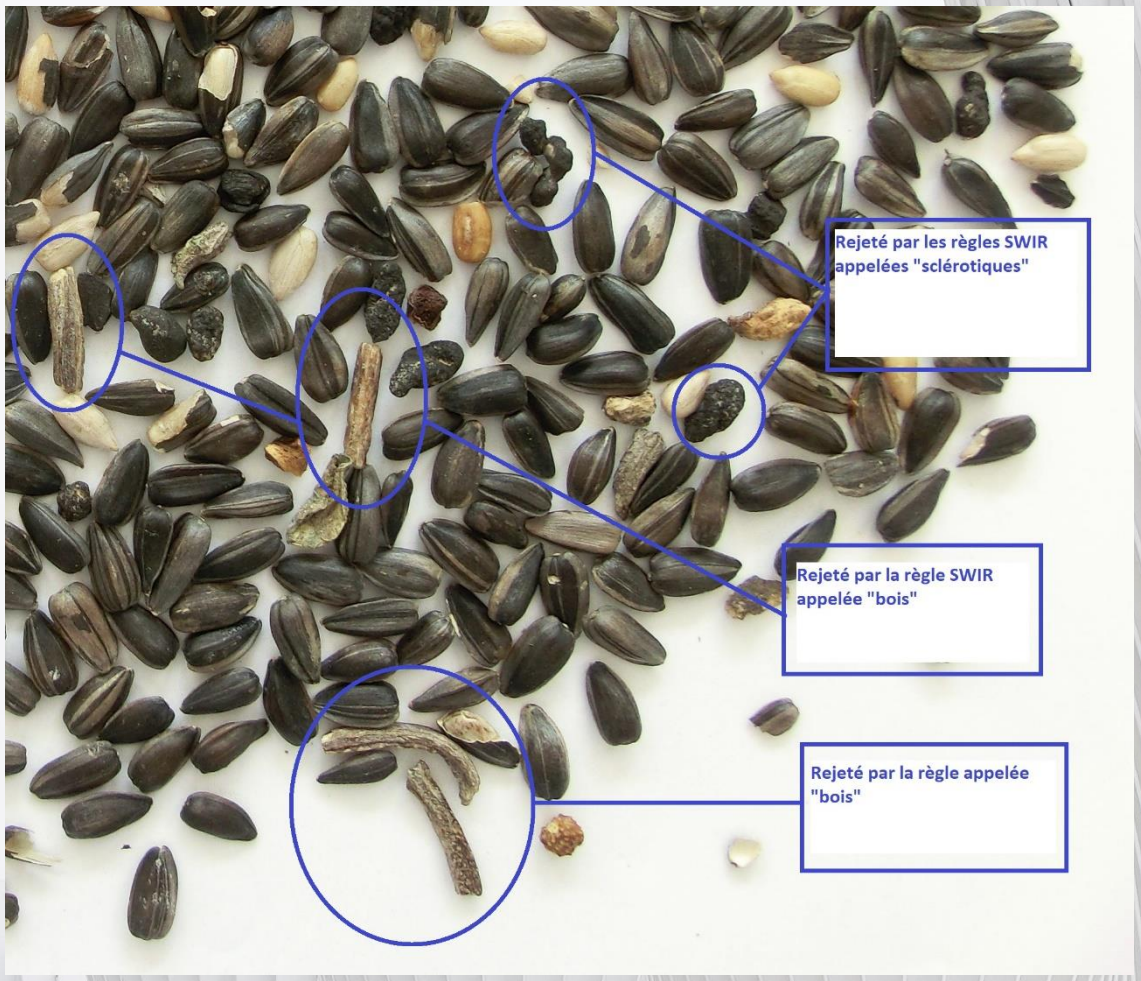
Shells in nuts

Examples of Infrared use



Stones in pulses

Examples of Infrared use

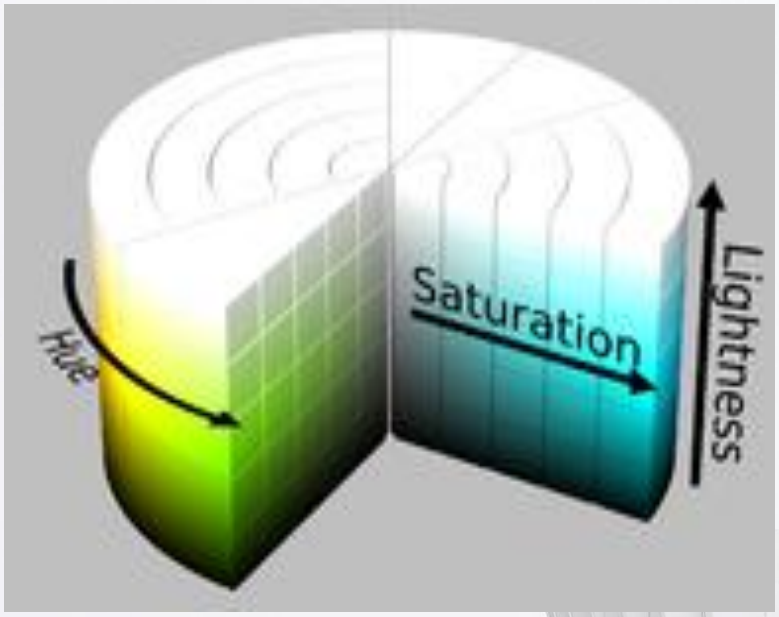


Sclerotic and stick in sunflower

Vision algorithms

HSL and cloud mapping – Shape & kernel analysis

Color cloud mapping - HSL



Quasar has an extremely sophisticated color mapping system:

- ✓ Works in HLS mode, the most similar to human vision
- ✓ 3D color-space mapping is extremely accurate
- ✓ Can see minimal color differences in objects with similar colors

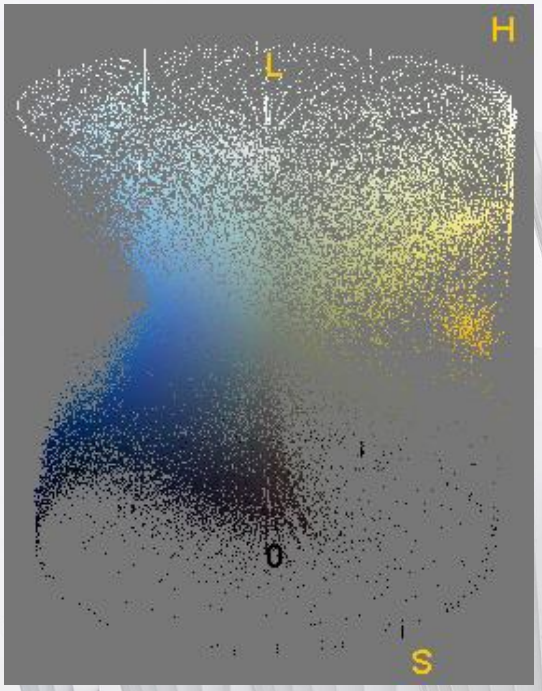
Key benefits:

unparalleled color accuracy, fully automatic settings

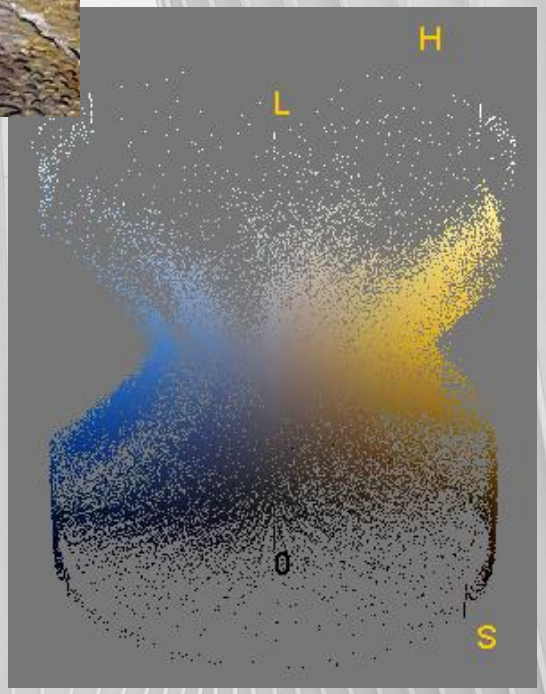
Color cloud mapping







3D color-space mapping is extremely accurate and allows to **map every pixel focusing even on the minimum differences in color graduation**



True-Shape & Kernel feature analysis

QUASAR has advanced features that allow it to analyze the shape and texture of an object:

- ✓ Width
- ✓ Length
- ✓ W:L Ratio
- ✓ Roundness / Edginess
- ✓ Defect size in pixel
- ✓ Relative defect size

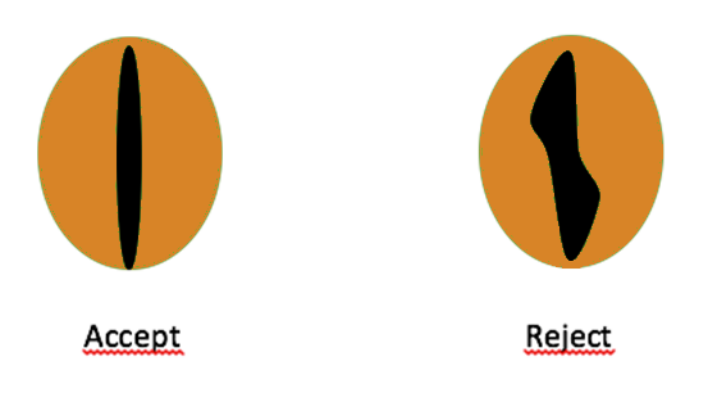


Key benefits:
many new possibilities to differentiate defects from the good material

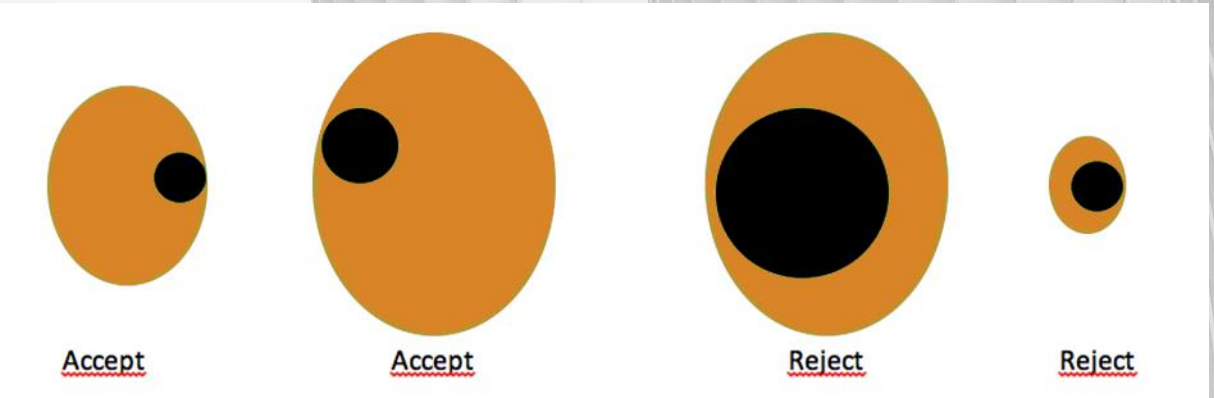
Kernel feature analysis

QUASAR can also see the **shape and size of the defects that are on the object itself,** for example it can:

- ✓ See the shape of a color defect on the object:



- ✓ See the relative size of the defect compared with the size of the object, e.g. reject when the defect is >30% of the total surface:



New User Interface, easier to use

The new UI has been designed with simplicity in mind, some key features are:

- ✓ Automatic learning system
- ✓ Simple controls for basic users
- ✓ Instant visual feedback during recipe creation

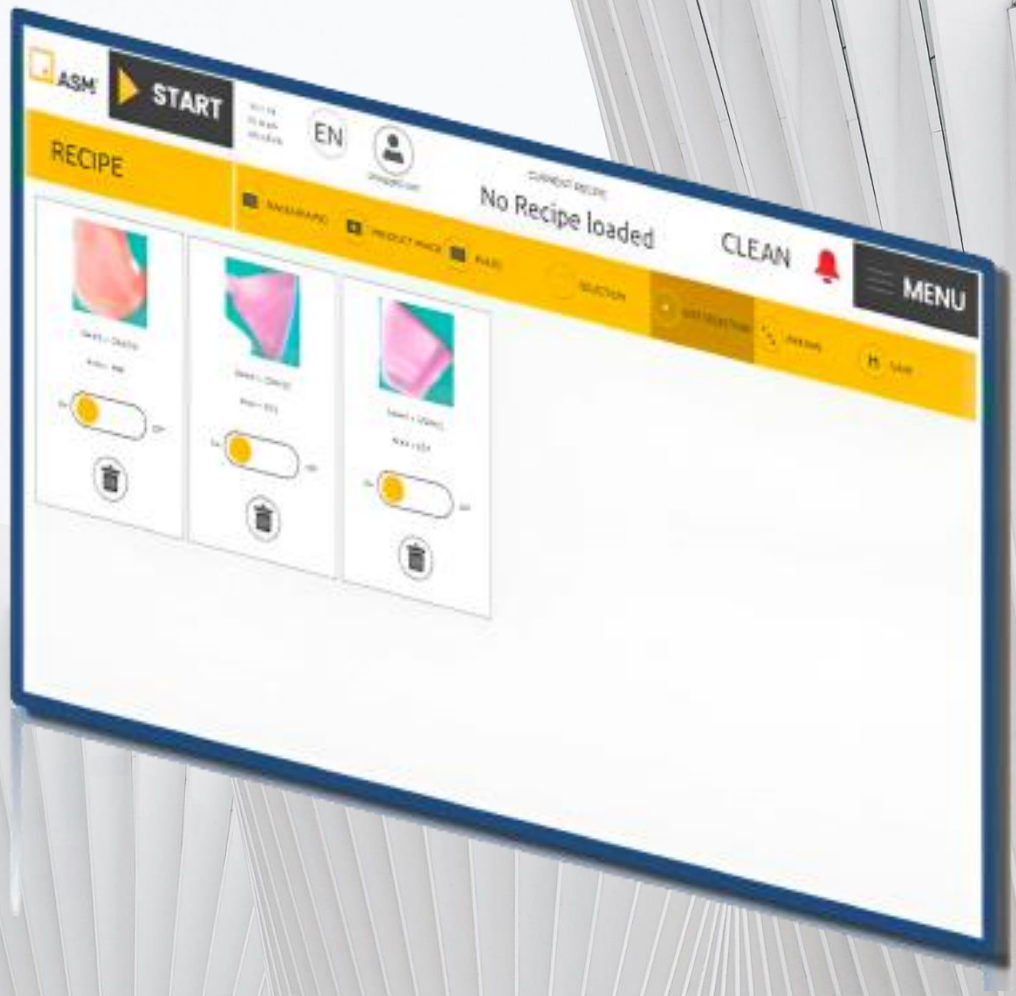
Key benefits:
reduced training time and increased productivity



Tap to Sort: create a recipe in a few minutes

- ✓ The machine takes a picture of the product as it falls
- ✓ The user can then tap with his/her finger the defects to be removed
- ✓ QUASAR does the rest, by dynamically creating the correct sorting parameters in order to achieve the best sorting results

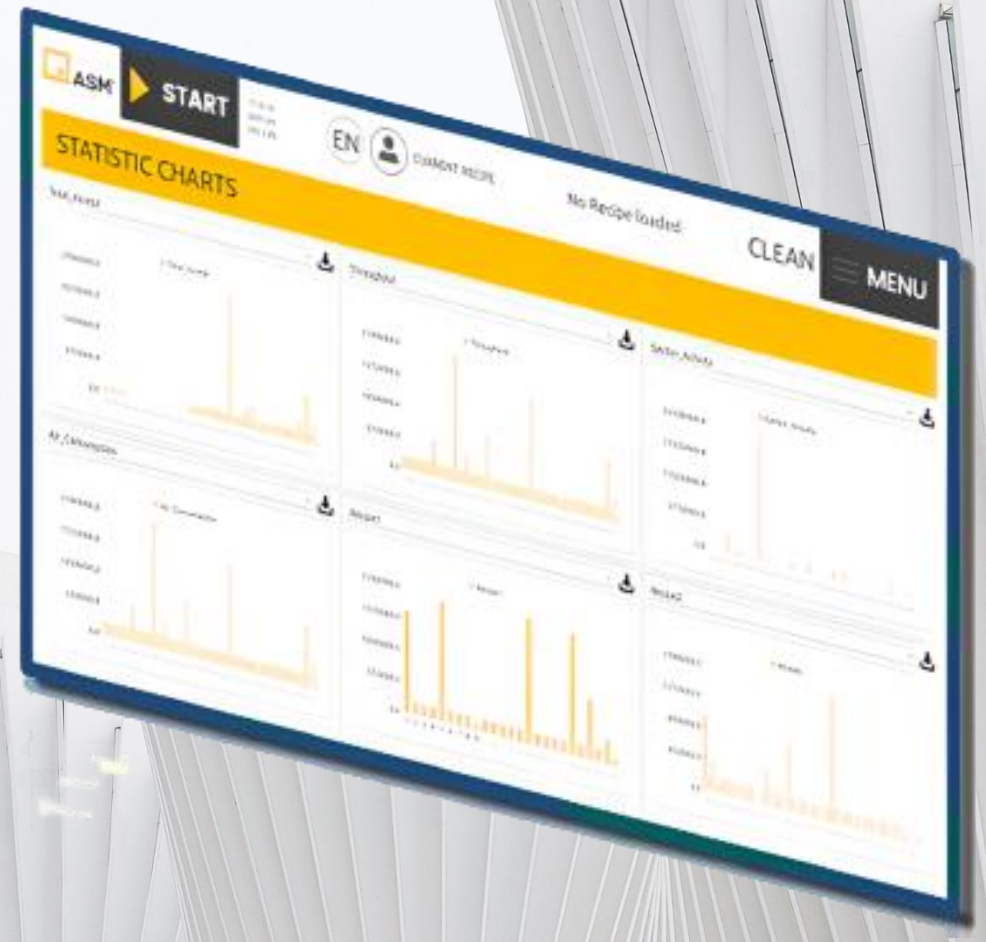
Key benefits:
reduced need for technical support.



Advanced statistics

Thanks to the new software the machine can show and record advanced statistics.

- ✓ Export statistic directly to USB stick
- ✓ Statistics for each defect type
- ✓ Excel compatible



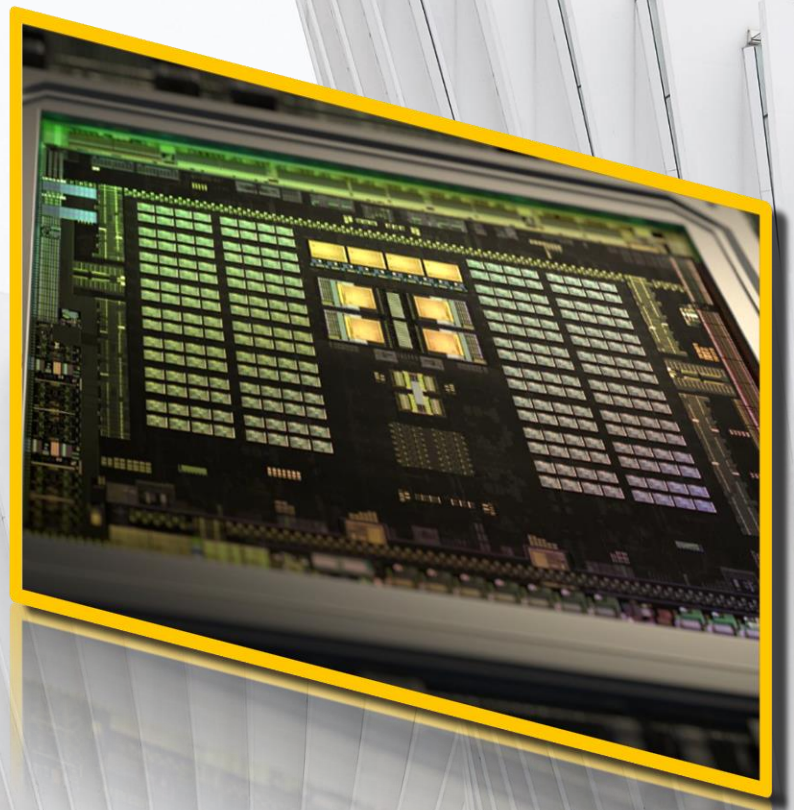
Key benefits:

QUASAR can be useful in highlighting trends in incoming product purity and help to better manage the production line

Logic: a new Optical Processing Architecture

- ✓ The electronic architecture of QUASAR is a giant leap forward and has nothing in common with the previous models
- ✓ The processing is done by powerful GPUs (graphics processing units) that are **thousands of times faster than previous processors**

Key benefits:
the system can be upgraded indefinitely into the future, adding more advanced features and cameras as they become available



Pneumatic system

Sniper ejector algorithm

Maximum throughput per chute

ASM uses the widest chutes on the market:

- ✓ 360 mm width
- ✓ 20% - 30% wider than competitors
- ✓ 72 ejector per chute (5mm pitch)

Key benefit:

fewer chutes are needed to achieve the required throughput



- ✓ Many types of flat, partitioned and channelized chutes, coated with a patented **anti-bacterial and food-safe polymer**

Key benefit:

Optimal product flow is ensured for a wide range of products



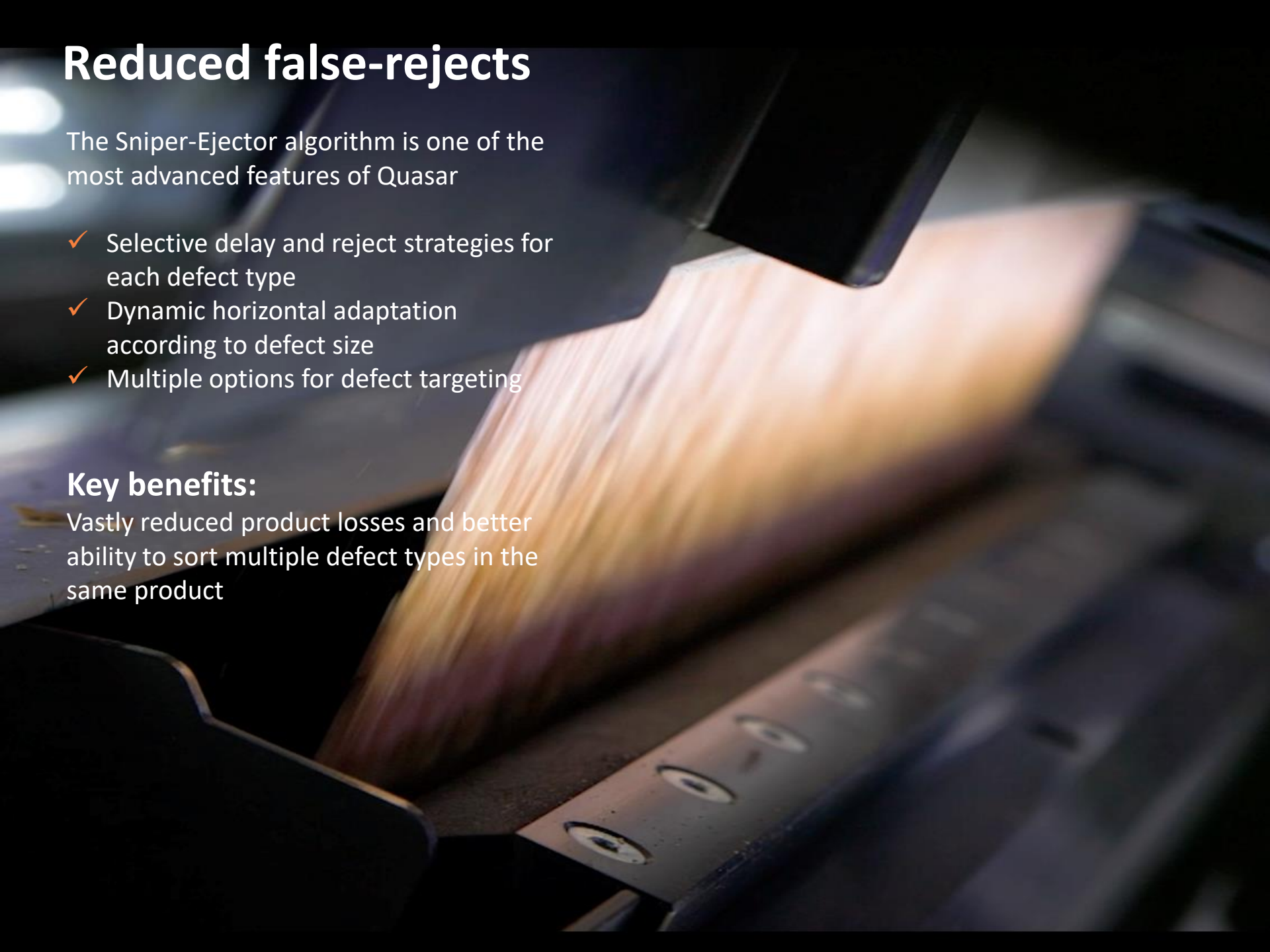
Reduced false-rejects

The Sniper-Ejector algorithm is one of the most advanced features of Quasar

- ✓ Selective delay and reject strategies for each defect type
- ✓ Dynamic horizontal adaptation according to defect size
- ✓ Multiple options for defect targeting

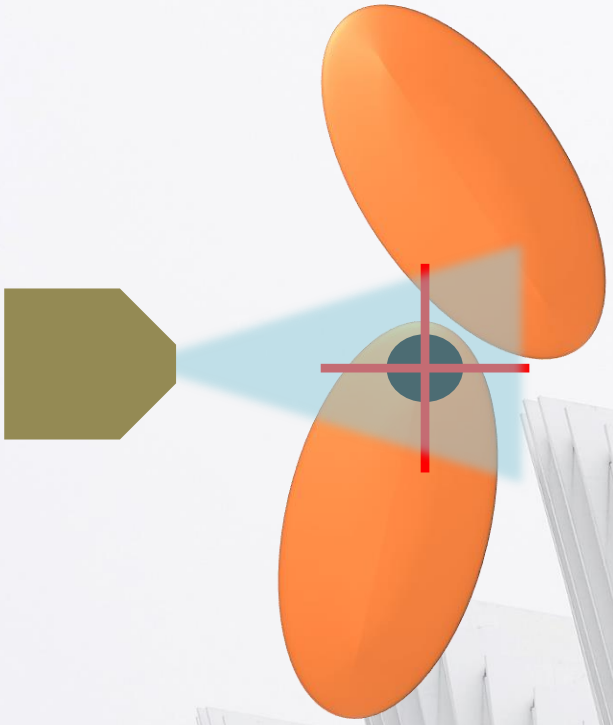
Key benefits:

Vastly reduced product losses and better ability to sort multiple defect types in the same product



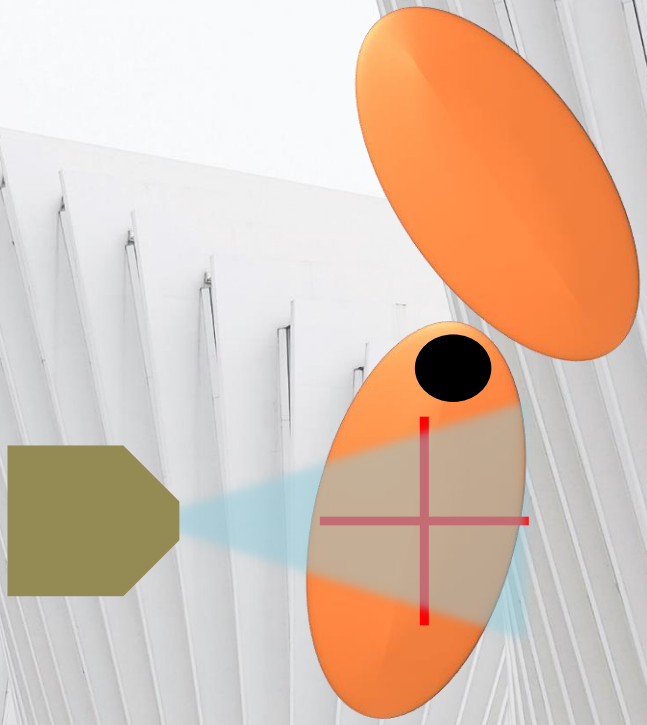
Sniper ejector algorithm

One of the options of this algorithm allows the machine to always shoot at the center of gravity of the object, this is very important in reducing false-rejects.



Target defect center

High risk of rejecting nearby accept material

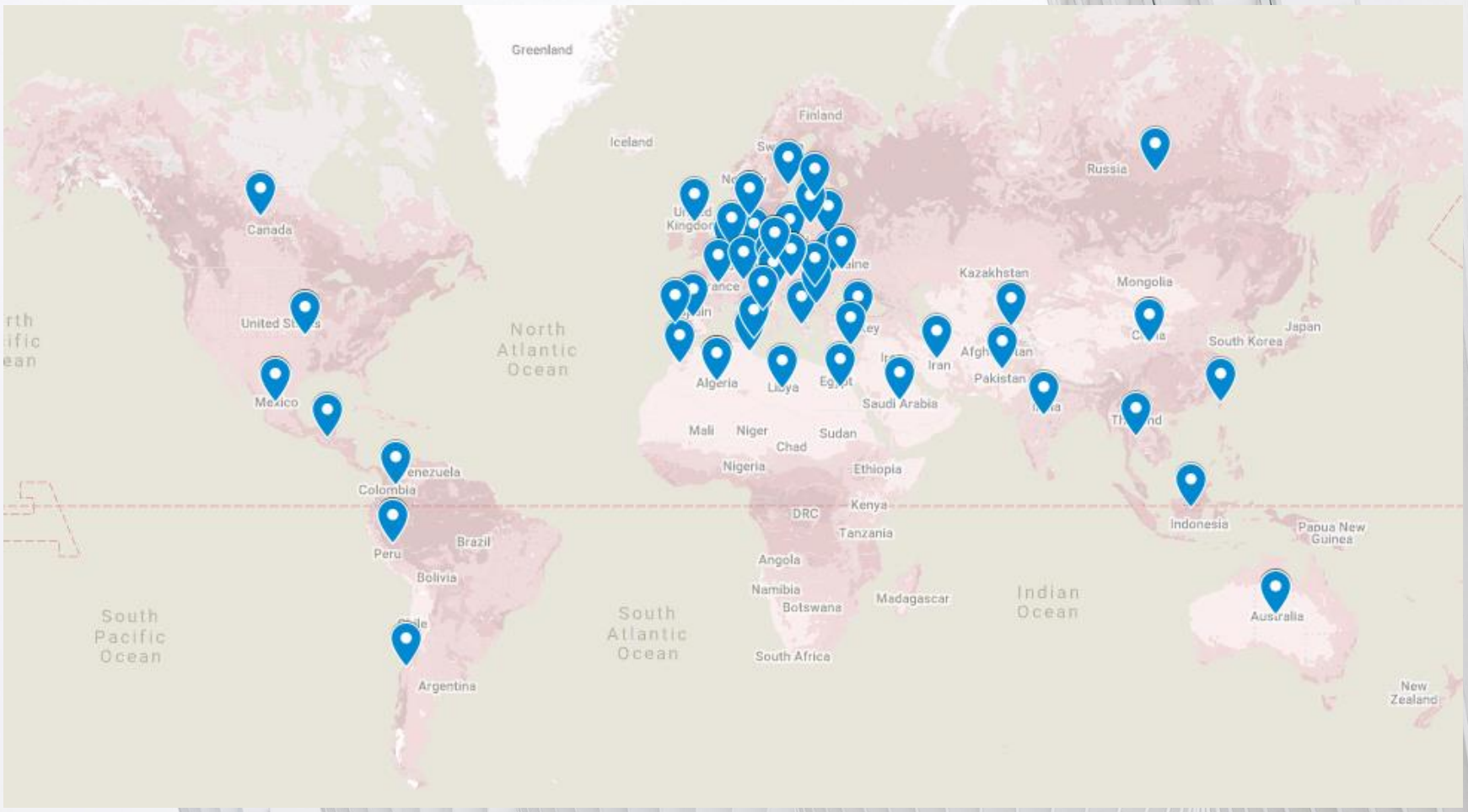


Target object center

The risk of rejecting nearby material is minimized

Installations worldwide

ASM installations worldwide



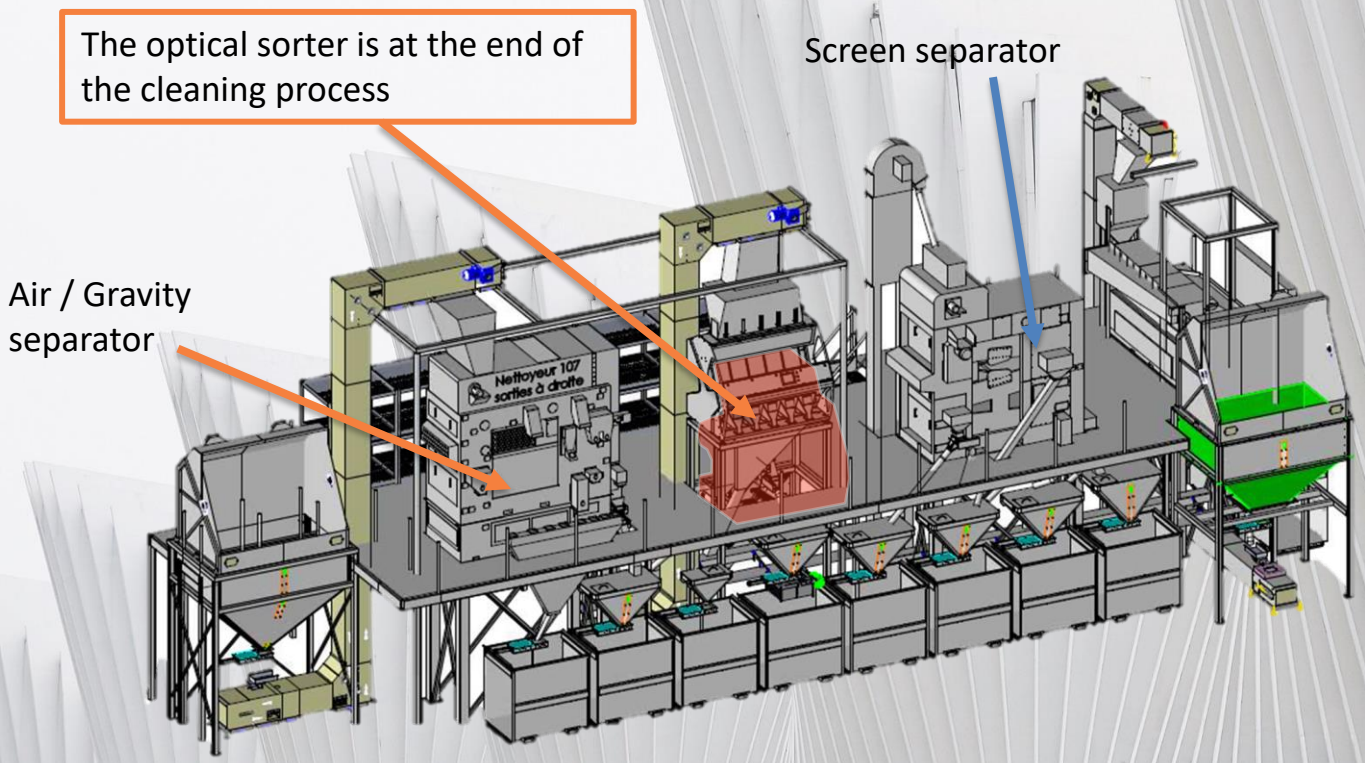
From local producers to large corporations our sorters are working in more than 60 countries!

Example of installation in a seed cleaning plant

This is an “End of Line” machine, so pre-cleaning steps such as de-dusting and de-stoning are necessary before the product enters the optical sorter.

Installation situation:

The machine is installed at the end of a cleaning process. Can be fed by screw conveyors, conveyor belts, pneumatic or bucket elevators, or directly from a big-bag or silo.
The output can be collected by the same methods and requires elevators in case of reject re-sort.



Conditions of use

Environmental conditions:
0ºC to + 40ºC without extra cooling / heating

Required power and air connections:
220V/50Hz – 1.5-3.0 Kw
2-7 Bar air pressure supply. The compressed air must be filtered according to the standards specified in the pre-installation and user manuals. If the compressed air does not comply with the Standards above, the solenoid valve warranty will be automatically void.
ASM machines are the only ones certified IP6X and are fully dust proof.

Cleaning conditions:
Use only the air gun (provided) and damp cloths with mild detergent.
The machine has an automatic cleaning system for the optical parts, while all internal compartments do not require cleaning as they are dust proof.
Do not use water under pressure to clean.

A selection of Test Reports

SOFT WHEAT

ASM advanced sorting machines A Company of elica

MODEL:	Quasar + SW
PRODUCT:	Soft wheat
TEST N° :	203-2020 B
DATE:	21/10/2020

INPUT | ACCEPT | FINAL REJECT*



SORTING RESULT

INPUT	
Capacity Kg/h chute	% Input Contamination
3750	2,4

ACCEPT	
% Accept as % of Throughput	% Accept Quality
93,6	99,91

FINAL REJECT*
% Reject as % of Throughput
0,99

REUSABLE PRODUCT AS INPUT*
% Accept as % of Throughput
5,41

* AFTER RE-SORT

SPELT

ASM advanced sorting machines

MODEL:	Quasar + SW
PRODUCT:	Spelt
TEST N° :	15-2022
DATE:	07/02/2022

INPUT | ACCEPT | FINAL REJECT*



SORTING RESULT

INPUT		ACCEPT		FINAL REJECT*
Capacity Kg/h chute	% Input Contamination	% Accept as % of Throughput	% Accept Quality	% Reject as % of Throughput
2000	2,3	87,5	99,92	3,81

REUSABLE PRODUCT AS INPUT*
% Accept as % of Throughput
8,69

* AFTER RE-SORT

OAT

ASM advanced sorting machines A Company of elica

MODEL:	Quasar
PRODUCT:	Hulled oats
TEST N° :	30-2021
DATE:	23/03/2021

INPUT ACCEPT REJECT



SORTING RESULT

INPUT		ACCEPT		REJECT
Capacity Kg/h chute	% Input Contamination	% Accept as % of Throughput	% Accept Purity	% Reject as % of Throughput
2000	3,5	88,7	99,98	11,3

WHITE BEANS

ASM advanced sorting machines

MODEL:	Quasar + SW
PRODUCT:	White beans
TEST N° :	10-2022
DATE:	04/02/2022



SORTING RESULT

INPUT		ACCEPT		FINAL REJECT*
Capacity Kg/h chute	% Input Contamination	% Accept as % of Throughput	% Accept Quality	% Reject as % of Throughput
1000	4	91,4	99,92	4,3

REUSABLE PRODUCT AS INPUT*
% Accept as % of Throughput
4,3

* AFTER RE-SORT

CHICKPEAS

ASM advanced sorting machines A Company of elica

MODEL:	Quasar +SW
PRODUCT:	Chickpeas
TEST N° :	74-2021 B
DATE:	12/10/2021

INPUT | ACCEPT | REJECT



SORTING RESULT

INPUT		ACCEPT		REJECT
Capacity Kg/h chute	% Input Contamination	% Accept as % of Throughput	% Accept Purity	% Reject as % of Throughput
2500	5,7	93,2	99,6	6,8

RED LENTILS

ASM
advanced sorting machines
A Company of elica

MODEL:	Quasar + SW
PRODUCT:	Red lentils
TEST N° :	72-2021 B
DATE:	07/10/2021

INPUT | ACCEPT | FINAL REJECT*



SORTING RESULT

INPUT	
Capacity Kg/h chute	% Input Contamination
1000	0,6

ACCEPT	
% Accept as % of Throughput	% Accept Quality
96,9	99,97

FINAL REJECT*
% Reject as % of Throughput
1,17

REUSABLE PRODUCT AS INPUT*
% Accept as % of Throughput
1,93

* AFTER RE-SORT

SOY

ASM advanced sorting machines
A Company of elica

MODEL:	Quasar
PRODUCT:	Soybean
TEST N° :	58-2020
DATE:	30/03/2020

INPUT ACCEPT REJECT



SORTING RESULT

INPUT		ACCEPT		REJECT
Capacity Kg/h chute	% Input Contamination	% Accept as % of Throughput	% Accept Purity	% Reject as % of Throughput
3000	5,3	89,4	99,94	10,6

LUPIN

ASM advanced sorting machines
A Company of clica

MODEL:	Quasar+SW
PRODUCT:	Lupin
TEST N° :	28-2021
DATE:	06/04/2021

INPUT | ACCEPT | REJECT



SORTING RESULT

INPUT		ACCEPT		REJECT
Capacity Kg/h chute	% Input Contamination	% Accept as % of Throughput	% Accept Purity	% Reject as % of Throughput
2000	0,48	99,2	99,99	0,8

ASM Customer Service

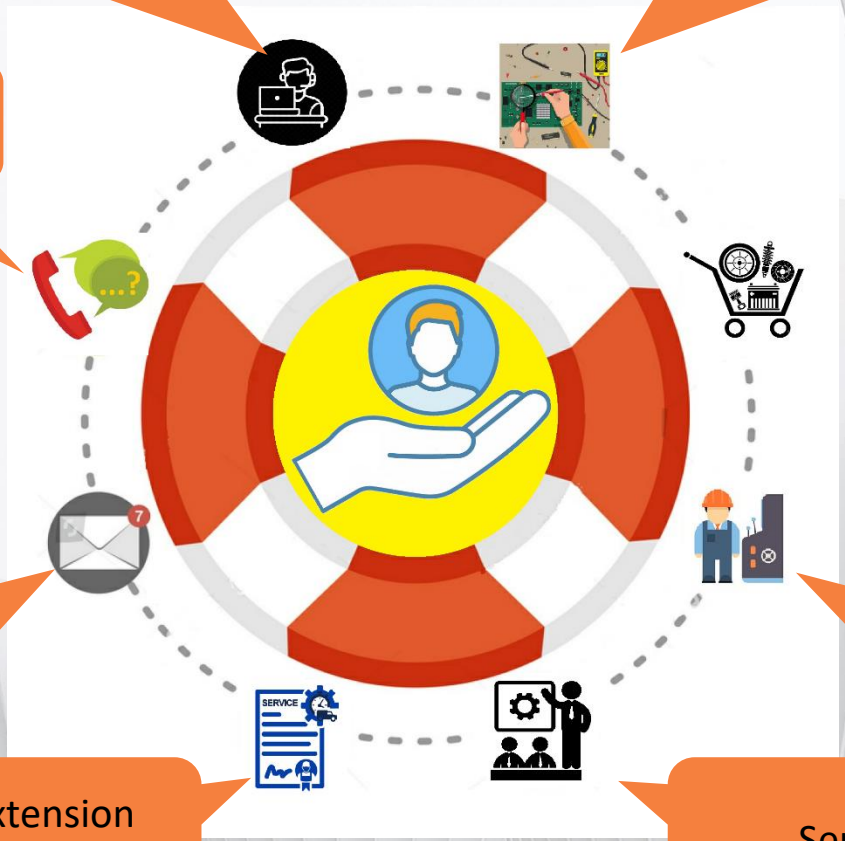
Customer at the centre of our Service

Remote assistance via internet

Repairing and reconditioning

Hotline

Upgrade kit and spare parts



Prompt support by email

Qualified engineers and timely intervention

- Warranty Extension
- Maintenance Contract

Service Training

Thanks for your attention



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