

# SPINE

A high capacity machine for  
automatic inspection and sorting of  
**TABLETS, CAPSULES & SOFTGELS**



**SENSUM**  
SHAPING  QUALITY



## **GAME-CHANGING INNOVATION**

Full user autonomy for new products  
with general inspection solution



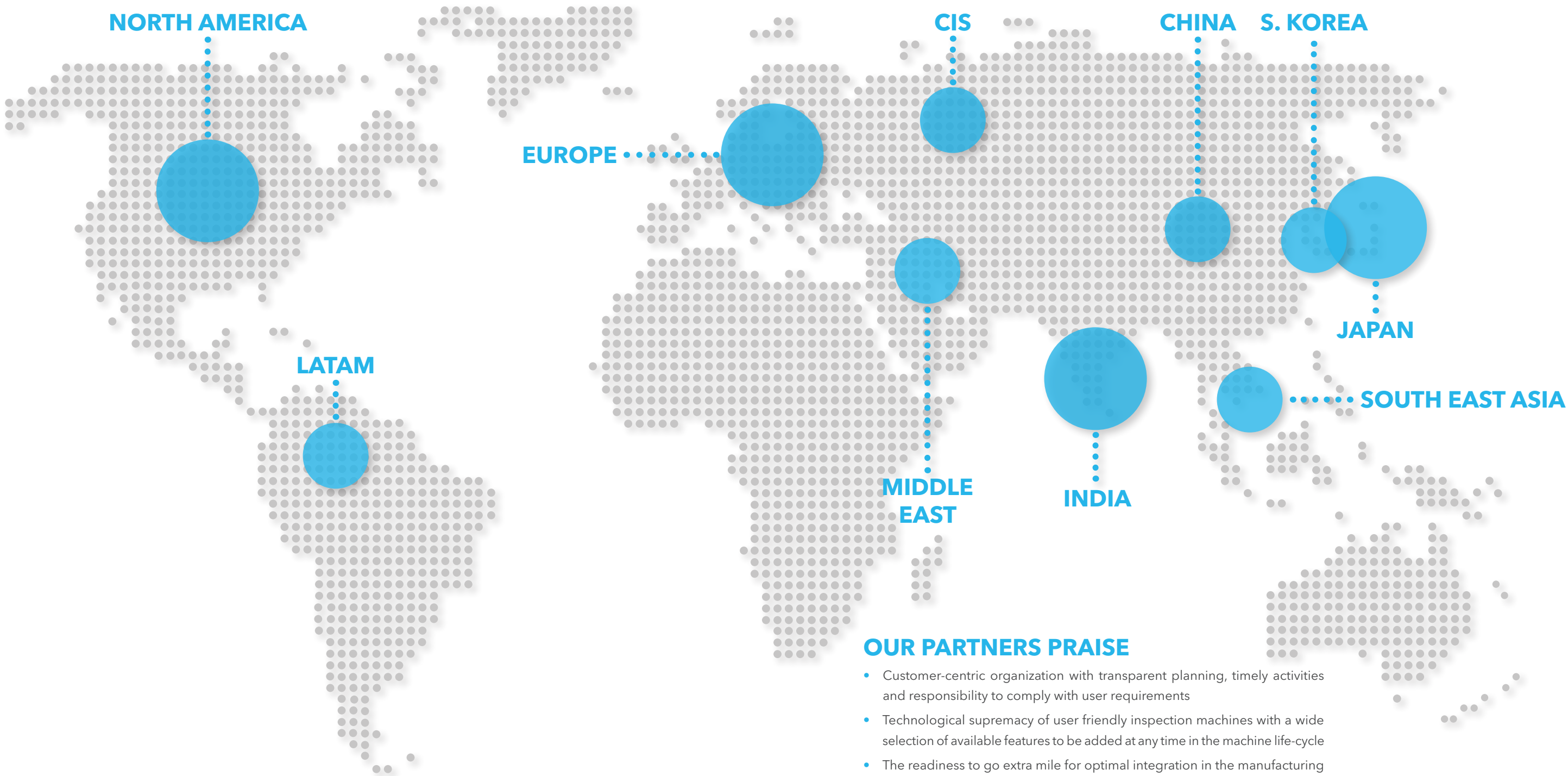
**Computer  
Vision  
Systems**

# Shaping quality of pharmaceuticals worldwide ...

**WITH CONTINUOUS INNOVATIONS,** industry proven solutions and customer-centric approach many leading multinational pharmaceutical companies, such as *Pfizer, Novartis, Roche, Bayer, Merck, Bristol Myers Squibb, Eli Lilly, Boehringer Ingelheim, Teva, Patheon, Catalent, Grünenthal, Sandoz, Perrigo,* have recognised **Sensum** as a trendsetter and a preferred supplier of machines for automatic inspection of tablets, capsules and softgels.

# ... with computer vision systems

Our fully automated inspection solutions use computer vision systems with digital cameras that replace human vision and computer algorithms that replace the human brain. Compared to manual process, the automated inspection provides faster, more objective, and more reliable performance, with uncompromised quality throughout entire batch inspection.

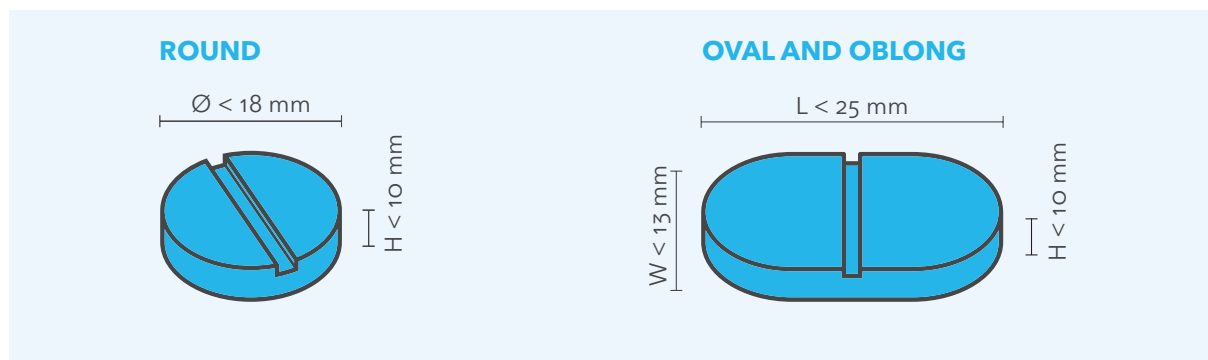


## OUR PARTNERS PRAISE

- Customer-centric organization with transparent planning, timely activities and responsibility to comply with user requirements
- Technological supremacy of user friendly inspection machines with a wide selection of available features to be added at any time in the machine life-cycle
- The readiness to go extra mile for optimal integration in the manufacturing process
- Cooperative and competent customer support

# Quality of tablets

## APPLICABILITY



Other special shapes and sizes of tablets are applicable upon request.

## INDICATIVE INSPECTION SPEEDS

### ROUND TABLETS

Ø (DIAMETER) IN MM	TABLETS / HOUR
13 - 18	210.000
10 - 12	420.000
8 - 9	520.000
7 - 5	630.000
< 5	830.000

### OVAL AND OBLONG TABLETS

L (LENGTH) IN MM	TABLETS / HOUR
> 18	150.000
14 - 18	230.000
11 - 13	310.000
8 - 10	390.000
< 8	470.000

Actual inspection speed depends on the shape, size and type of tablets, and on the type of inspected features. In special cases, even higher inspection speeds might be possible with dedicated solution.

## TYPICAL DEFECTS

The list below shows some of the typical defects on tablets. The **SPINE** machine can detect and sort out a much wider list of different defects.

### ROUND TABLETS

BRIGHT DOTS



DARK DOTS



CRACKS



COLOUR DEVIATION



CHIPS



EDGE DARK DOTS



ENGRAVING DEFECTS



### OBLONG TABLETS

DOTS



COATING DEFECTS



CRACKS



LAMINATION



CHIPS



PRINT DEFECTS



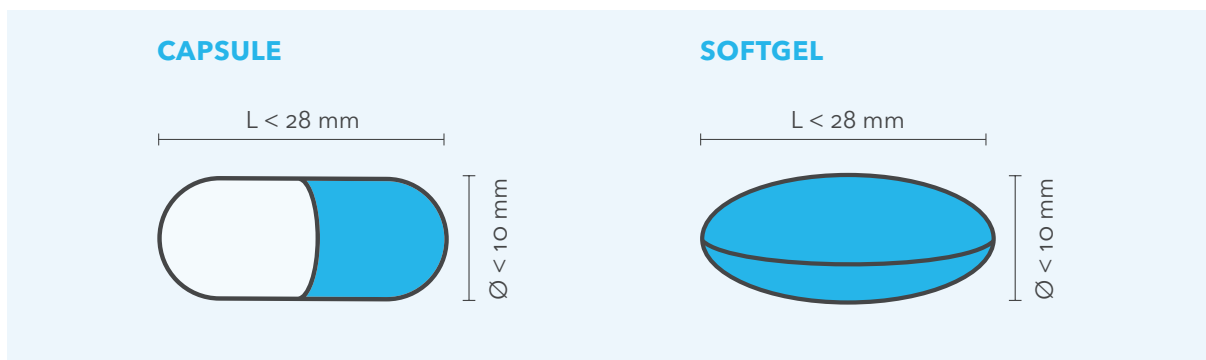
ENGRAVING DEFECTS





# Quality of capsules and softgels

## APPLICABILITY



Other special shapes and sizes of capsules and softgels are applicable upon request.

## INDICATIVE INSPECTION SPEEDS

### CAPSULES

SIZE	CAPSULES / HOUR
000 & 00 & 0 & 1 & 2	200.000
3 & 4 & 5	300.000

### SOFTGELS

L (LENGTH) IN MM	SOFTGELS / HOUR
> 15	160.000
14 - 15	280.000
11 - 13	380.000
8 - 10	470.000
< 7	570.000

Actual inspection speed depends on the shape, size and type of capsules and softgels, and on the type of inspected features. In special cases, even higher inspection speeds might be possible with dedicated solution.

## TYPICAL DEFECTS

The list below shows some of the typical defects on capsules and softgels. The **SPINE** machine can detect and sort out a much wider list of different defects.

### CAPSULES

DENTS



TIP DEFECT



LENGTH



JOINTS



HOLES



DOUBLE CAP



PRINT DEFECTS



### SOFTGELS

TWINS



SIZE



DAMAGED SEAM



DIRT



HAIR



BUBBLES



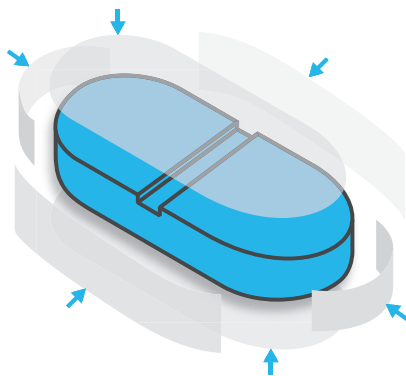
BROKEN



# Reliable inspection by controlled and stable product flow

## 100 % SURFACE INSPECTION OF EACH PRODUCT

- Six inspection units, one for each side of product
- Colour, backlight and 3D images are acquired simultaneously for each side of product
- Totally 18 images per product are used in inspection



COLOUR



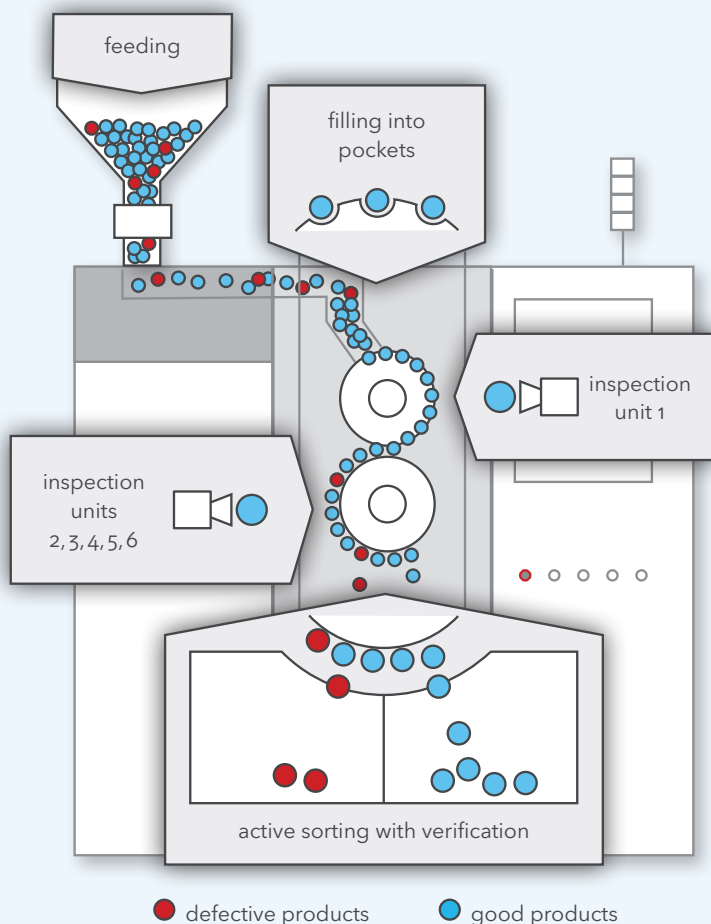
BACKLIGHT



3D



## RELIABLE MECHANICAL MANIPULATION



The product flow in **Sensum SPINE** starts by feeding of products from the input container to a filling unit. The filling unit fills the products into pockets of an upper inspection cylinder, where the products are held in defined, stable and repeatable position by vacuum.

The rotating upper inspection cylinder transfers the products to the first **inspection unit**, where the top surface of the products is imaged. The products are then transferred to the lower inspection cylinder to the five additional inspection units where all remaining surfaces are imaged.

The acquired images are then analysed and each product is **classified as good or defective**. The sorting unit actively sorts individual products into bins for good and defective products and verifies if the sorting was performed correctly.

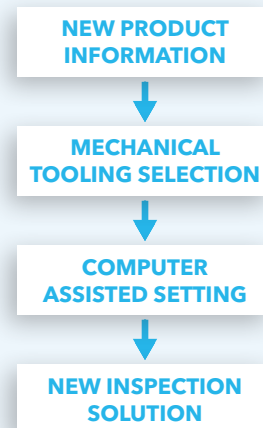
The inspection process is monitored and controlled by graphical user interface.

# Efficient production by simple machine operation

## AUTONOMY FOR NEW PRODUCTS

### General inspection solution for standard products

- Full user autonomy for introduction of new products
- Standard pre-manufactured mechanical and software tooling for round, oblong & oval tablets and for capsules & softgels
- Controlled procedure for creating new inspection solution
- Simple machine operation with:
  - intuitive and easy to use operation
  - transparent and well-defined process steps
  - effective performance, powered by AI for defect identification

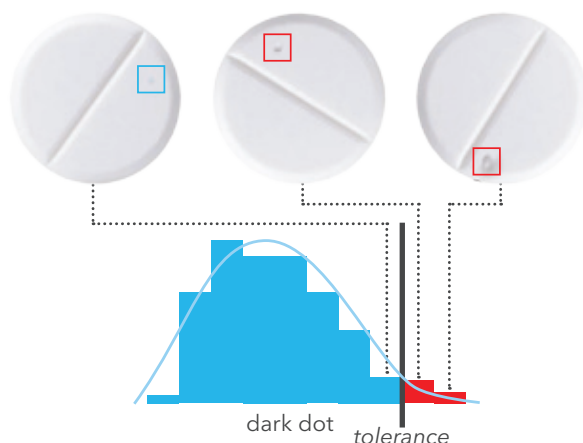


### Dedicated inspection solution for specific requirements

- Interchangeable with general inspection solution
- Dedicated plug & play tooling for special types of product shapes and sizes, or specific requests on enhanced throughput and particular quality demands

## 10 MINUTE MACHINE SET UP

- No defects needed for training
- Computer assisted setting procedure
- Intuitive sensitivity setting with immediate feedback on detection performance and yield



## 10 MINUTE MACHINE CLEANING AND CHANGEOVER

- Ergonomic tool-free design
- Easy cleaning
- No adjustment of optical system needed

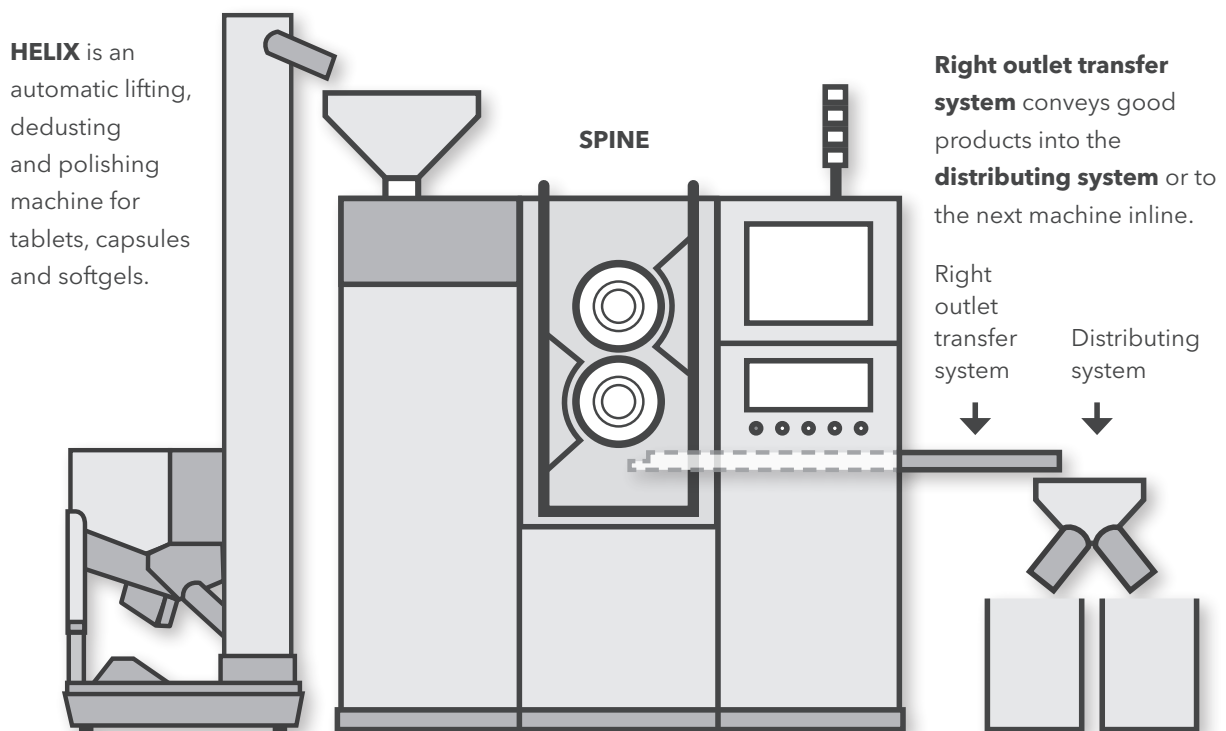




# Standalone or inline operation

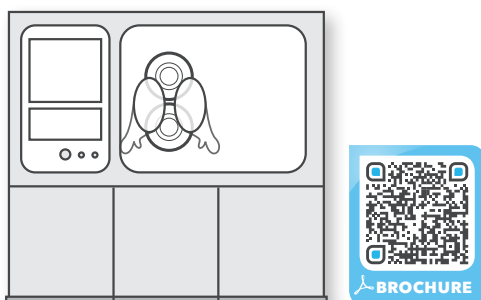
**SPINE** machine is an automated inspection system that can be used standalone or in-line. In standalone operation, inspection and sorting requires no operator intervention other than periodical refilling of the input container with uninspected products and replacing full containers of good products with empty ones. For in-line operation, Sensus also provides upstream and downstream solutions for automatic transfer of the product to and from the **SPINE** machine enabling continuous inspection process.

Besides high volume inspection, **SPINE** also supports full process automation in production with additional functionalities such as product counting and sampling, recording of related data, integration of metal detector and data exchange with facility communication systems.



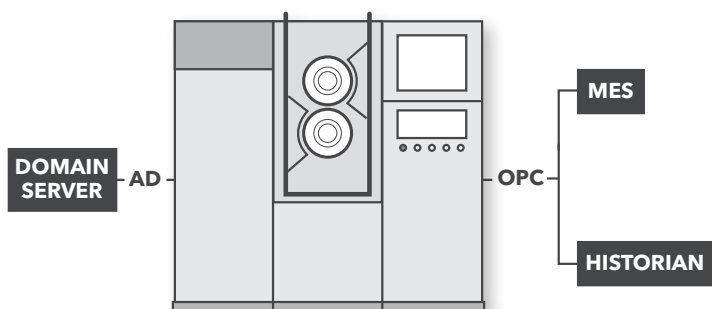
## CONTAINMENT SOLUTION

**SPINE HYPO** offers **SPINE** technology for contained automatic visual inspection and sorting of highly potent products.



## FACILITY INTEGRATION

**SPINE** is customizable to a wide variety of facility systems used in pharmaceutical industry.



# Assured compliance with SPINE inspection



**TRY BEFORE YOU BUY.** The performance of any inspection technology should be carefully evaluated before making an investment. We encourage you to get in touch with **SPINE** and test its performance.

A white paper that explains why this is important.



## HIGHLIGHTS

- All-in-one visual inspection machine for tablets, capsules and softgels
- High speed inspection of up to 830.000 products/hour
- Extensive range of product sizes from 2 mm up to 28 mm
- High colour sensitivity with 3D inspection for low contrast surface defects
- User autonomy for outstanding flexibility to new product introduction with general inspection solution
- Reliable active sorting with verification failsafe ejection control system
- No defects needed for machine training
- Intuitive user-friendly graphical interface
- Ergonomic design and simple changeover
- Scalable machine design enables functional upgrades for new requirements throughout machine life cycle
- Local and global support

## TECHNICAL DATA



### APPLICATION

Tablets, capsules and softgels



### SPEED

Up to 830.000 products/hour



### TYPICAL ELECTRICAL CONNECTION

400/230V



### COMPRESSED AIR

6 Bar,  
100 Nm<sup>3</sup>/h



### DIMENSIONS L x W x H

L = 1860 mm  
W = 860 mm  
H = 2145 mm



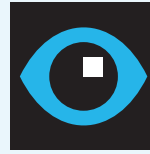
### WEIGHT

~ 1200 kg

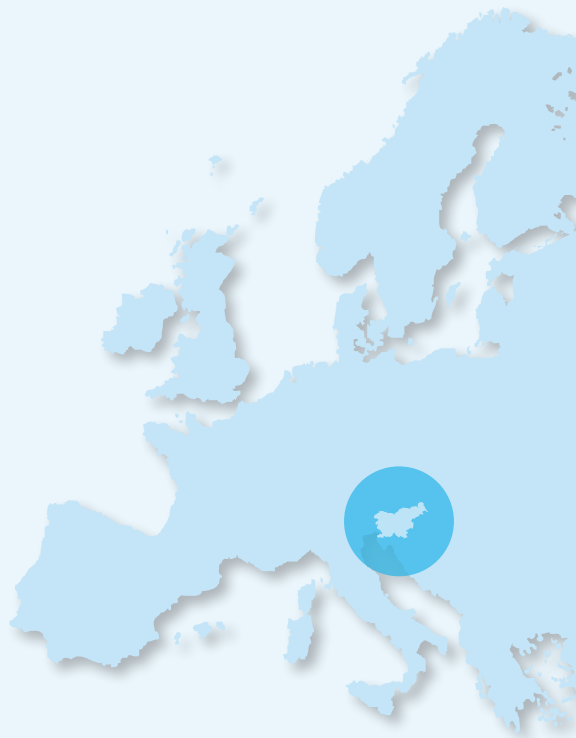


### CONSTRUCTION

CE, GMP, FDA acceptable materials



**SENSUM**



## **SENSUM**

*Computer  
Vision  
Systems*

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## **ABOUT SENSUM**

We specialise in the development and production of automatic visual inspection systems for the pharmaceutical and nutraceutical industry. We provide high and mid capacity solutions for 100% quality inspection of tablets, capsules, transparent capsules and softgels and in-line PAT solution for real-time visual monitoring of pharmaceutical processes.



## **FOLLOW US**

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