



SENSUM

STREAM CORE

Automatic quality inspection and sorting of capsules

Human view

Machine view

Can't see what's wrong?
Machines inspect quickly, accurately and reliably.
Let them remove your quality risks.



Stream of high quality products

The companies are pushing their manufacturing capabilities to the limits, while the quality requirements of the products is higher than ever. In manufacturing, considerable efforts are put in detection and ejection of low quality products, either manually or automatically.

Through its consistent innovation and more than 40 years of experience in computer vision, many leading multinational pharmaceutical companies have recognized Sensum as the technology leader and preferred supplier of machines for automatic visual inspection and sorting of oral solid dosage forms. Our understanding of product quality and solutions are welcomed worldwide and even in most demanding countries, such as Japan, where visual perfection is of utmost importance.

We provide inspection solutions best suited for capsule production that needs to respond to market changes quickly. With our solutions, we are striving to help you achieve constant stream of high quality products to the market.

We know the problem

The quality of the final capsules is determined by quality of supply material, manufacturing processes, product handling and packaging. Our computer vision systems can reliably detect wide range of critical, major and minor defects, by visual inspection of capsule contrast, shape, surface, and imprint features.

Contrast defects



Dots, stains, dirt



Color deviation, foreign product or particles

Shape defects

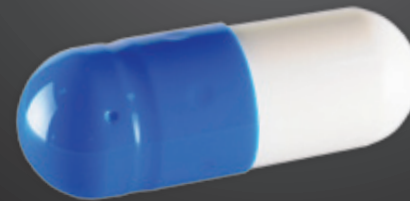


Dents, crashed, meshed, bent



Size, shape, length, double cap

Surface defects

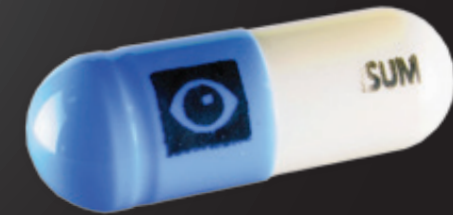


Air bubbles, holes, cracks, scratch



Telescoped, rough cut, split

Imprint defects



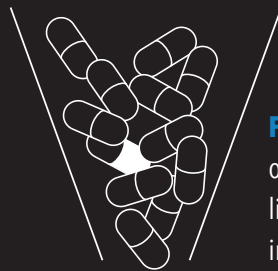
Missing print, missing characters



Blurred print, dirt on print

Excellence in product manipulation

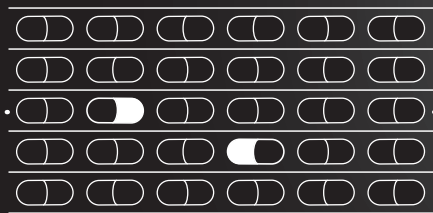
The product manipulation is the foundation of reliable imaging and high quality inspection. It provides stable and gentle manipulation, where products are consistently set into relevant position for imaging and sorting.



Feeding: The feeding system organizes the products into lines for stable and continuous inspection.

Clear vision

Clear vision for us is the art of imaging, where even the smallest product defects are distinctly visible on images. Clear vision is the core to successful and reliable inspection solutions and strongly relies on advanced imaging technologies, such as lighting modalities, precise optics and multimodal imaging.



Manipulation: The manipulation transfers the products to the imaging area. Gentle manipulations allow controlled movement of capsules for accurate and reliable imaging.

$$TPR = \frac{1}{1 + e^{-\frac{1}{\mu} \times \left(\frac{FPR}{1-FPR} \right)^{\frac{1}{\mu}}}}$$

$$|v| = 12 \quad u < 3, 4 >$$

$$v = |v| \cdot \mu \quad \mu = \frac{u}{|v|}$$

$$|u| = \sqrt{3^2 + 4^2}$$

$$x_{1/2} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$f(x) = \frac{1}{1 + \exp(-a(x))}$$

$$a(x) = \sum_{j=0}^M w_j h_j(x) = v^T h(x)$$

$$h_j(x) = \sum_{k=0}^D \phi(w_{jk} x_k) = \phi(w_j^T x)$$

$$c = \int c' k = \int (c') k = \dots = x + G$$

$$|x-y| = ?$$

$$V_{cr} = V_0 \cdot \cos(\varphi)$$

$$V_{cr} = V_0 \cdot \sin(\varphi)$$

$$V_{cr} = 2 \cdot \frac{V_{cr}}{D_c}$$

$$(x, y, z) = (x_0, y_0, z_0) + \lambda(u, v, z)$$

$$(x_0 + \lambda u)^2 + (y_0 + \lambda v)^2 = R^2$$

$$\vec{g} = \beta(\beta \cdot \vec{g}) + (-\beta \times (\beta \times \vec{g})), \quad |\vec{\beta}| = 1$$

$$\frac{\sin \alpha}{x} < \frac{x-1}{k}$$

$$\sqrt{2x+1} + \sin x = 5 \quad \pi = 3,141592$$

$$\therefore x \cdot \varphi = \sin x + \cos y$$

$$x^2 = 2x + 3 \quad \frac{x}{2}$$

Science made easy

The product quality is measured on images by software solutions based on the latest scientific developments. However, because science does not belong into production, we put lots of effort into technology simplification, where use of our solutions requires no scientific background or computer vision expertise.



Sorting: The active sorting system with sorting verification reliably rejects any product, that does not meet quality criteria.

STREAM CORE

Our experience integrated

Our know-how on capsule quality, advanced imaging technologies, and reliable sorting is integrated into STREAM Core, a compact capsule inspection machine.

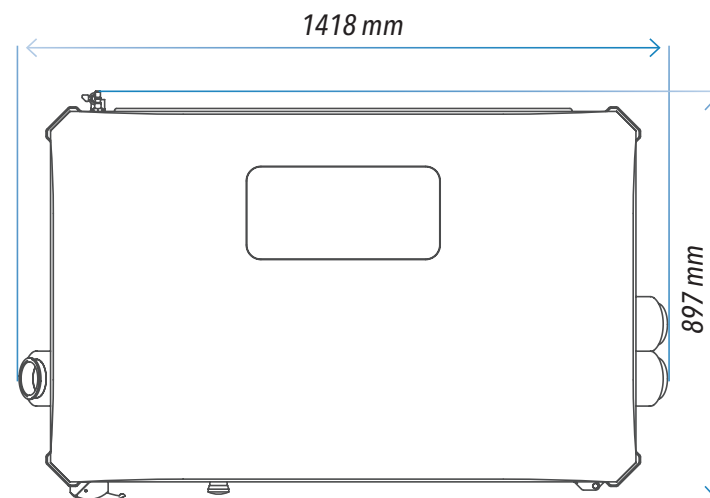
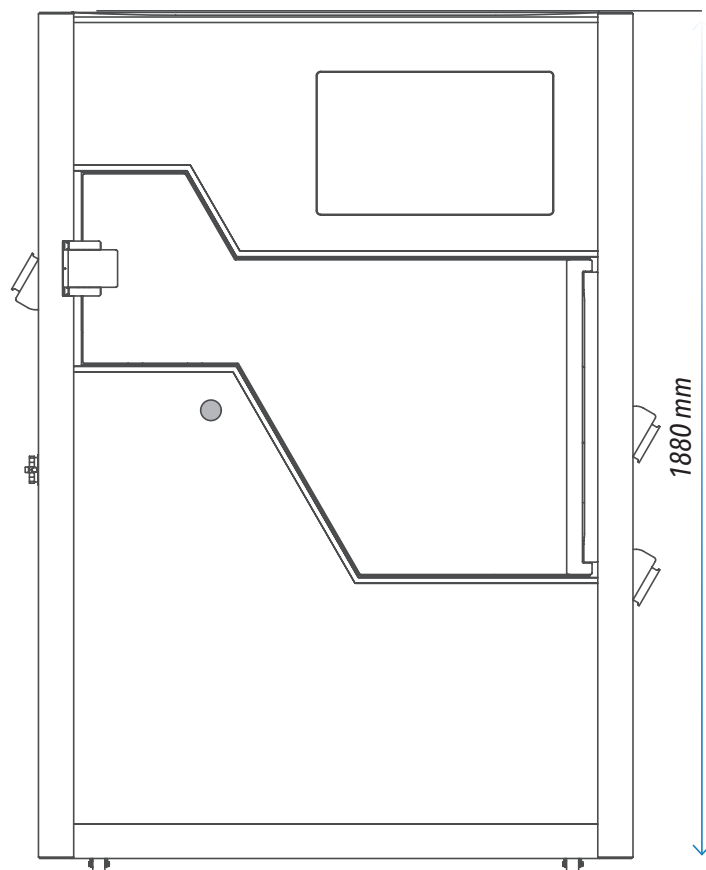


Efficiency with simplicity

Simplicity in operation equals efficient production.

STREAM Core's operational autonomy requires minimal human intervention and reduces risk of human errors. The ergonomic and tool free design with low number of parts contributes to high efficiency, where changeover and cleaning is done in a few minutes.

Function	Inspection, counting and sorting
Applicability	Hardgel capsules sizes 000 to 5
Capacity	120.000 Products / hour for capsule size 0-5 80.000 Products / hour for capsule size 00 and 000
Media	230 V, compressed air
Weight	650 kg



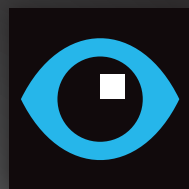
Continuous product feeding from a hopper

Capsule positioning for imaging

Imaging area

Sorting with sorting verification

Product outlet for good and defective products



SENSUM

Sensum
Computer Vision
Systems

Tehnološki park 21
1000 Ljubljana
Slovenia, EU
www.sensum.eu
info@sensum.eu



The right solution for you

Find out more about STREAM and discuss the possibilities best for you.

The quality is in your reach

Visit us at our worldwide showroom locations and test the technology with your products.

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Made in Slovenia, EU



BROCHURE