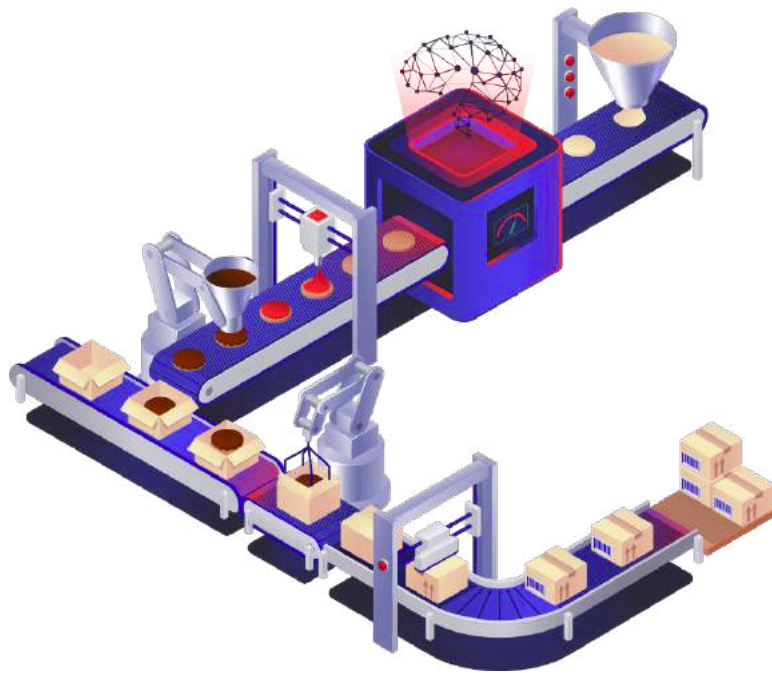




 FIRECRUX

**Smart X-ray
inspection system**

Production process

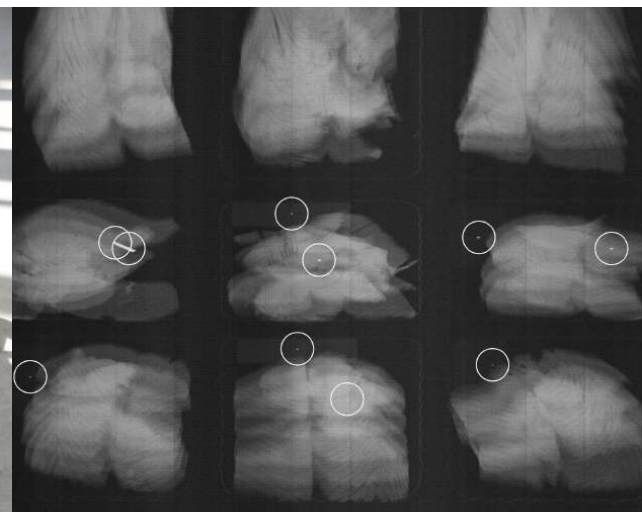


1 Salmon processing

2 Entry of products into the X-ray detector

3 Contamination detection

Foto: Milarex





Become Industry 4.0 manufacturer

Introduce self-optimizing and self-learning systems into the production process. Use the power of AI to produce much faster and more efficiently.

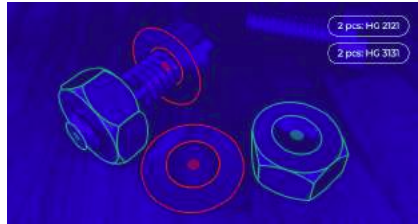
Our Smart X-ray inspection system will:

- detect contaminants: stainless steel (even as small as 0,5 mm in diameter), ceramics, glass, mineral stone, calcified bone, dense plastics **with greater efficiency**
- more than **50% increase of the speed of production lines** thanks to a faster detection method and the reduction or elimination of false positives (FP)
- recognize the type of contamination, not just its presence
- deliver new capabilities for the safety and quality department

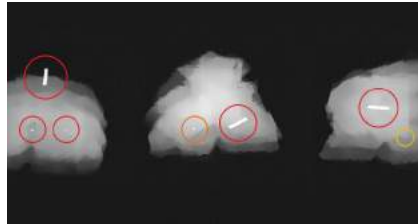


More detection capabilities

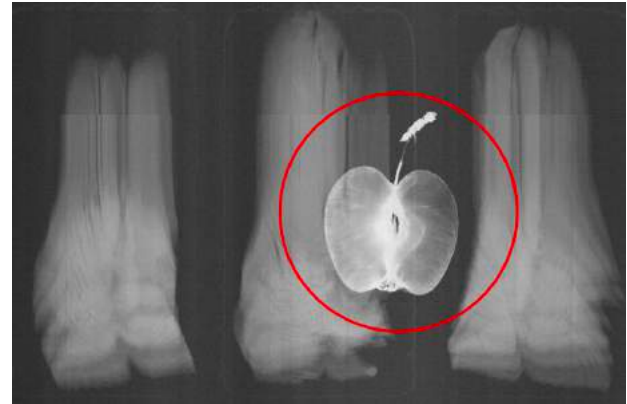
Visual detection based on machine learning algorithms can play many roles in the production process. It will both find the right objects (desirable or not), but is also able to count, measure, weigh or compare them with a given pattern.



Recognition of the type of objects in order to complete the set (e.g. in the furniture industry).



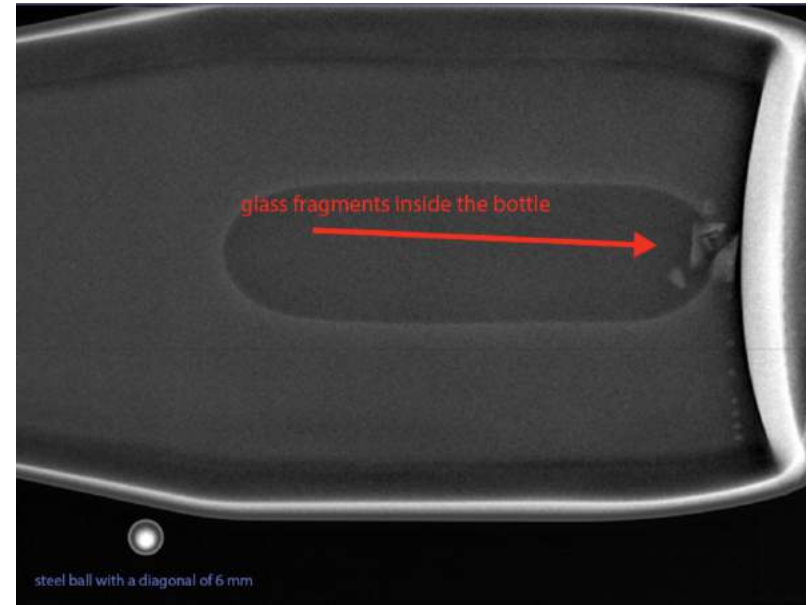
An example of detection with the determination of the size of the object as a parameter of the threat.



The classification model is also trained based on the perfect product pattern. Thanks to this, even if the AI does not find a known contamination on the product, it will be able to react due to the lack of confirmation of a clean scan.

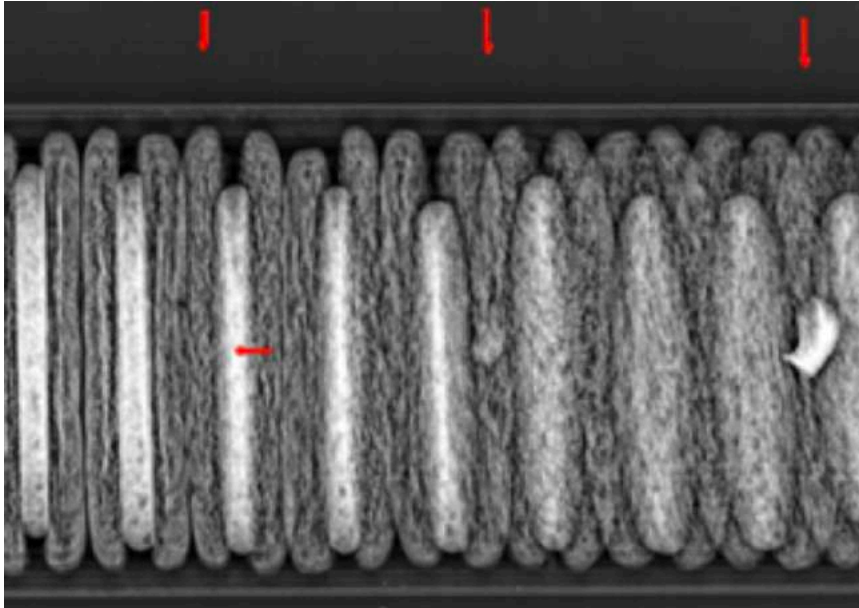
Glass-in-glass testing

The current R&D efforts are focused on glass damage detection and glass-in-glass detection.



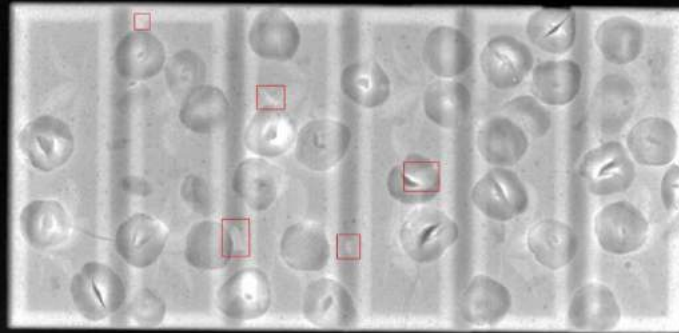
Bakery case

Contaminants detection and morphology control (broken pieces) in cookies.

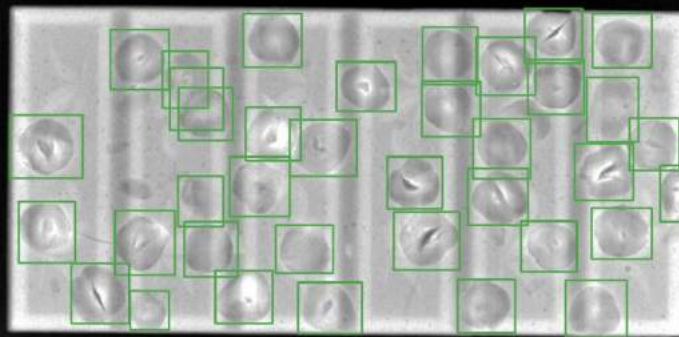


Chocolate, nut shells detection

Shells



Nuts



FIRECRUX implementation in Milarex

We implemented FIRECRUX in Milarex, a large salmon processor. It all started in 2017 and since then we have achieved:

- an increase in contamination detection efficiency by **61%**
- an increase in production line speed by **66%**.

Start of cooperation

Beginning of research and development work on the X-ray detection system

System development

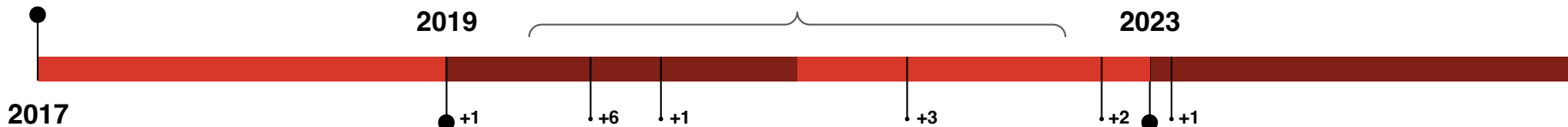
During the development of the system, the X-ray lamp was changed, a central server was created to manage all machines and collect statistical data.

scanned until 09/02/2023

23 550 290 total cycles

1 cycle = 6/9/12 trays of salmon

107 917 total detections



Factory deployment

The first factory implementation included **1 X-Ray Scanner** and achieved higher detection efficiency than the previous system.

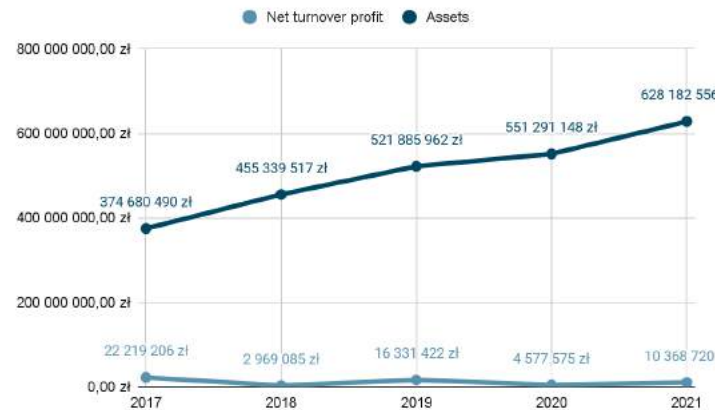
Maintenance contract

In November 2022, a system maintenance contract was signed to ensure trouble-free operation for the next years.

About Milarex

Milarex, a salmon processing company, has already exceeded EUR 200 million in annual turnover. The goal of Milarex's owner, **Summa Equity fund**, is to make it the largest salmon processor in the world.

The expansion of the factory is still in progress. **FIRECRUX** is already installed on 14 production lines. Ultimately, 60 production lines are to be built.



282 603 480

total trays of salmon

scanned until 09/02/2023

40 120

avg of salmon trays per day

between Nov 2022 and Feb 2023

99.9995%

current detection efficiency

in relation to FP (false positives)

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692 361 761



partners



clients

