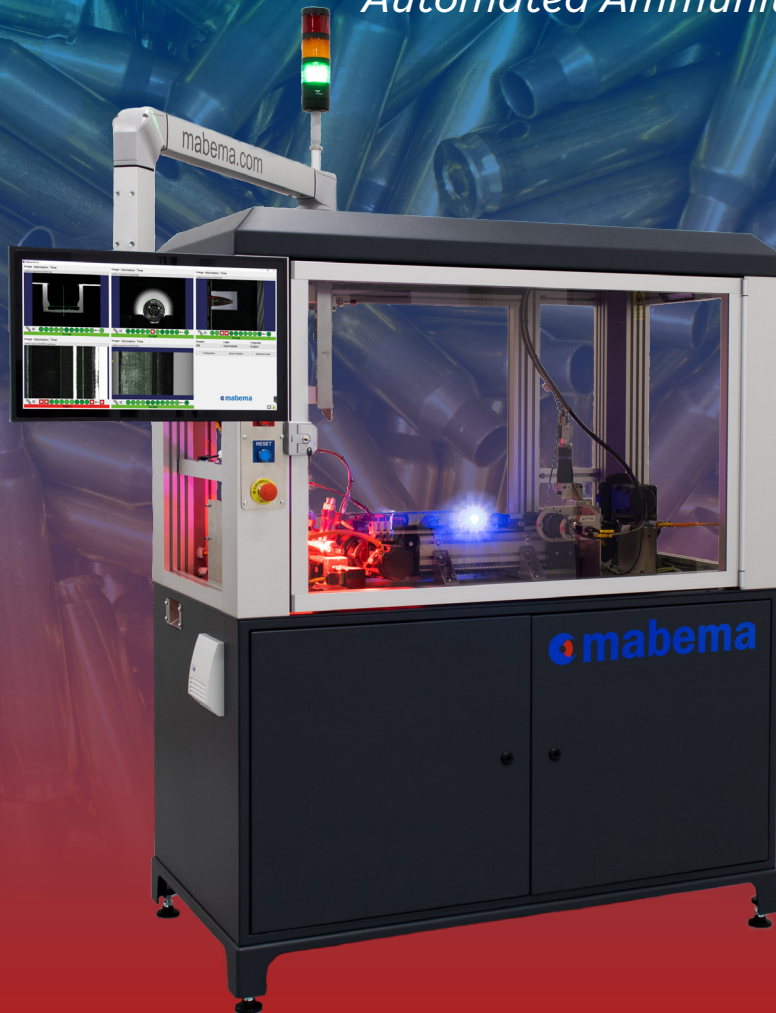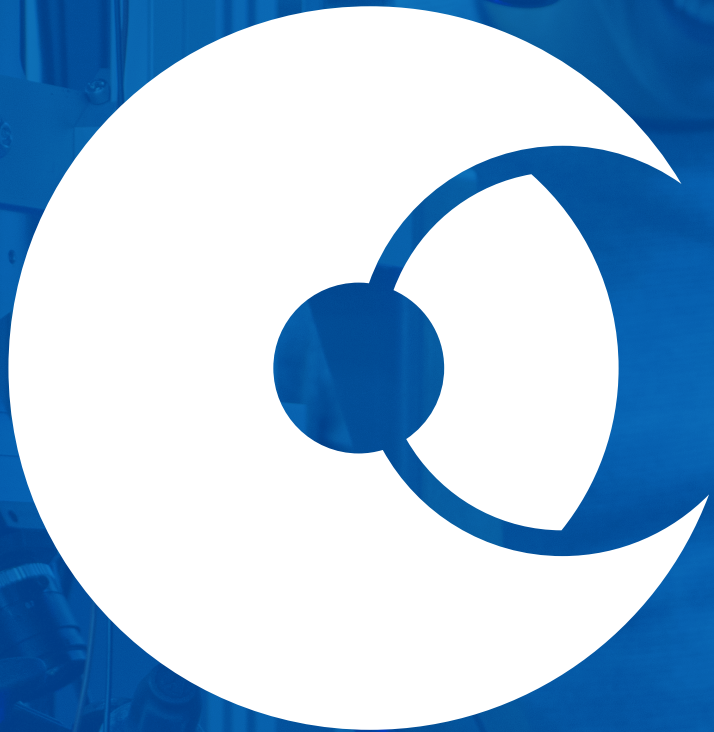# Vision for precision

Automated Ammunition Inspection

mabema

Our history began in the Swedish nuclear power industry in the early 2000s and still to this day, Mabema is Scandinavia's leading supplier of radiation-resistant camera technology and image processing products. In addition, we analyze more than 120 billion images every year in the most demanding manufacturing industries such as medicine and automotive.

We have broad and high-level R&D expertise in advanced camera technology and image processing that enables innovative, easy-to-use and state-of-the-art machine vision solutions.

At Mabema, we are passionate about what we do. We are at the forefront of the development of machine vision technology in Europe and it is our passion that drives us to do better every day.

Objectivity.

Objective quality. All the time. The cases or cartridges are objectively inspected to detect, identify and quantify critical defects. The Mabema AAI 3.0 can thoroughly detect 30+ defects at a speed of 120 parts per minute, faster and more accurate than the human eye. Rejected parts are automatically sorted into four different reject bins enabling fast subjective inspection.

Stay in control. With real time statistics, you can quickly locate where in the manufacturing process maintenance actions are needed to minimize rejected cases or cartridges. The need for maintenance will decrease over time, keeping the rejected parts at a minimal level. Optimized control of operations will also provide supply chain functions with accurate and legitimate data to facilitate external dialogues.

Profitability for real. The Mabema AAI 3.0's ability to export inspection statistics to Microsoft Excel or any ERP software allows for any management to regularly follow up on the effectivity results. The inspection statistics can also be helpful to determine if there is other machinery that advantageously can be replaced over time.

4

Flexibility.

The flexibility of the AAI 3.0 is unmatched. Any caliber between diameter 6-16 mm / 0.2-0.6" and any length between 15-100 mm / 0.6-3.9"can be inspected. A change between calibers is done within 10 minutes. Just change the feeder wheel and guiderails, then choose your caliber in the operator interface. Then you are all set. No need to adjust light sources or move any cameras.
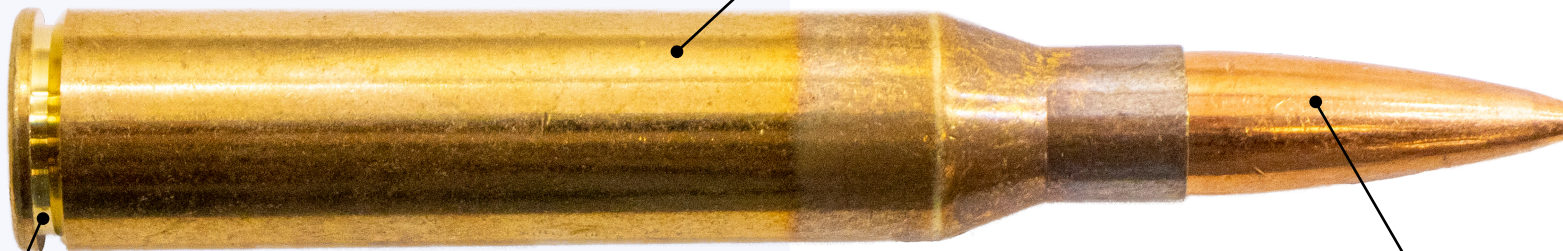
Inspection examples.

Head

- Head stamp
- Rim diameter
- Primer presence, dents and scratches
- Sealant coating (paint if applicable)
- Crimp (if applicable)
- Firing hole presence, diameter and placement
- Chips in firing hole

Case

- Bulges
- Cracks
- Dents
- Scratches
- Wrinkles
- Total length
- Annealing
- Concentricity

Extractor Groove

- Missing extractor groove
- Double extractor groove
- Magnum belt
- Groove depth
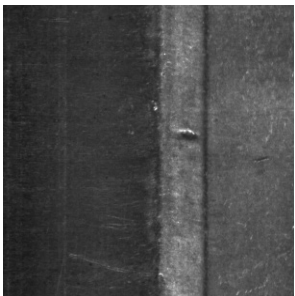- Extractor thickness and angle
- Rim thickness
- Rim diameter

Mouth

- Missing material
- Cracks
- Circularity
- Chips
- Diameter
- Notches

Projectile

- Bullet tip shape
- Wrong bullet type
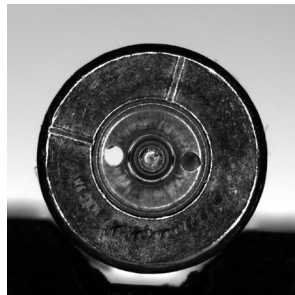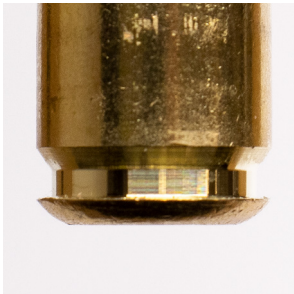- Larger tip defects
- Color of paint

Objective quality.

Below are a few examples of defects that are detected in the Mabema AAI 3.0.

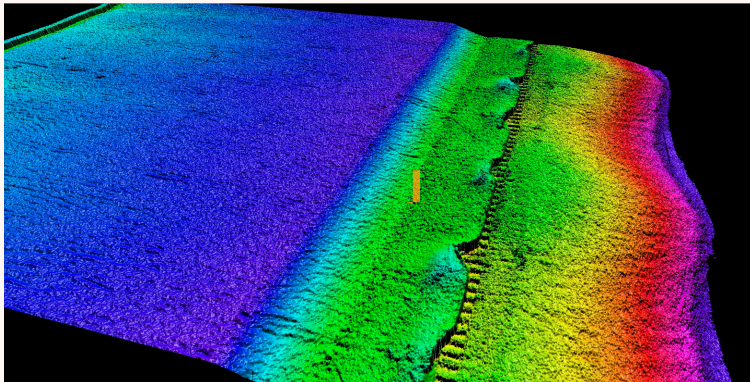Wrinkle at chest detected with line scan camera.

Bad shaped rim measured with back light for a sharp silhouette image.

Missing firing hole easily detected through back light.

Unique 360° 3D inspection.

During rotation hundreds of images are acquired and stitched together to a full 360 3D image of the unwrapped surface.
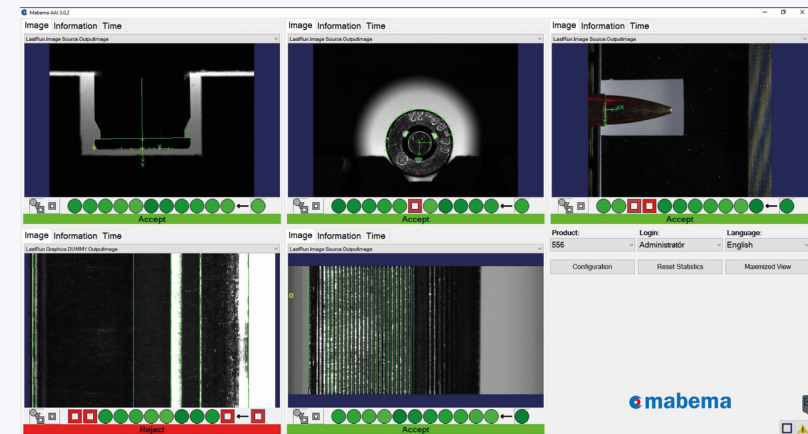

Dent at body detected with 3D technology. 3D data enables detection of geometrical defects at high resolution.
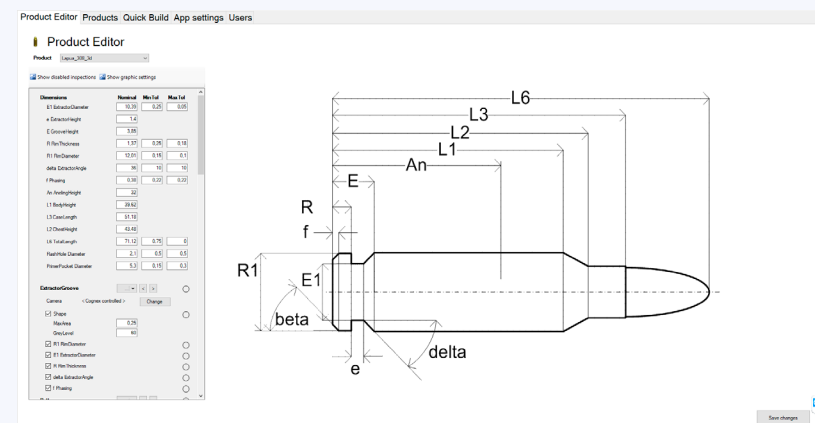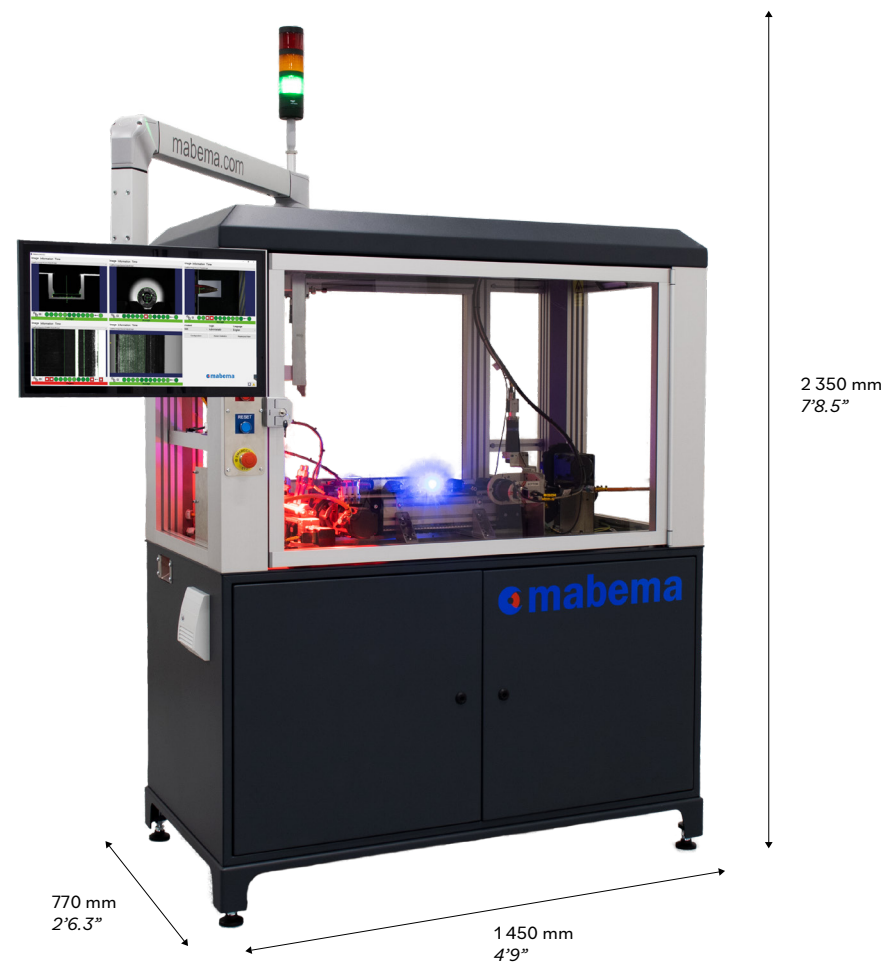
User Interface.

The user interface provides real time statistics. The Mabema AAI 3.0 has ability to export inspection statistics to Microsoft Excel or any ERP software.

The machine user interface makes it simple to configure new product characteristics.
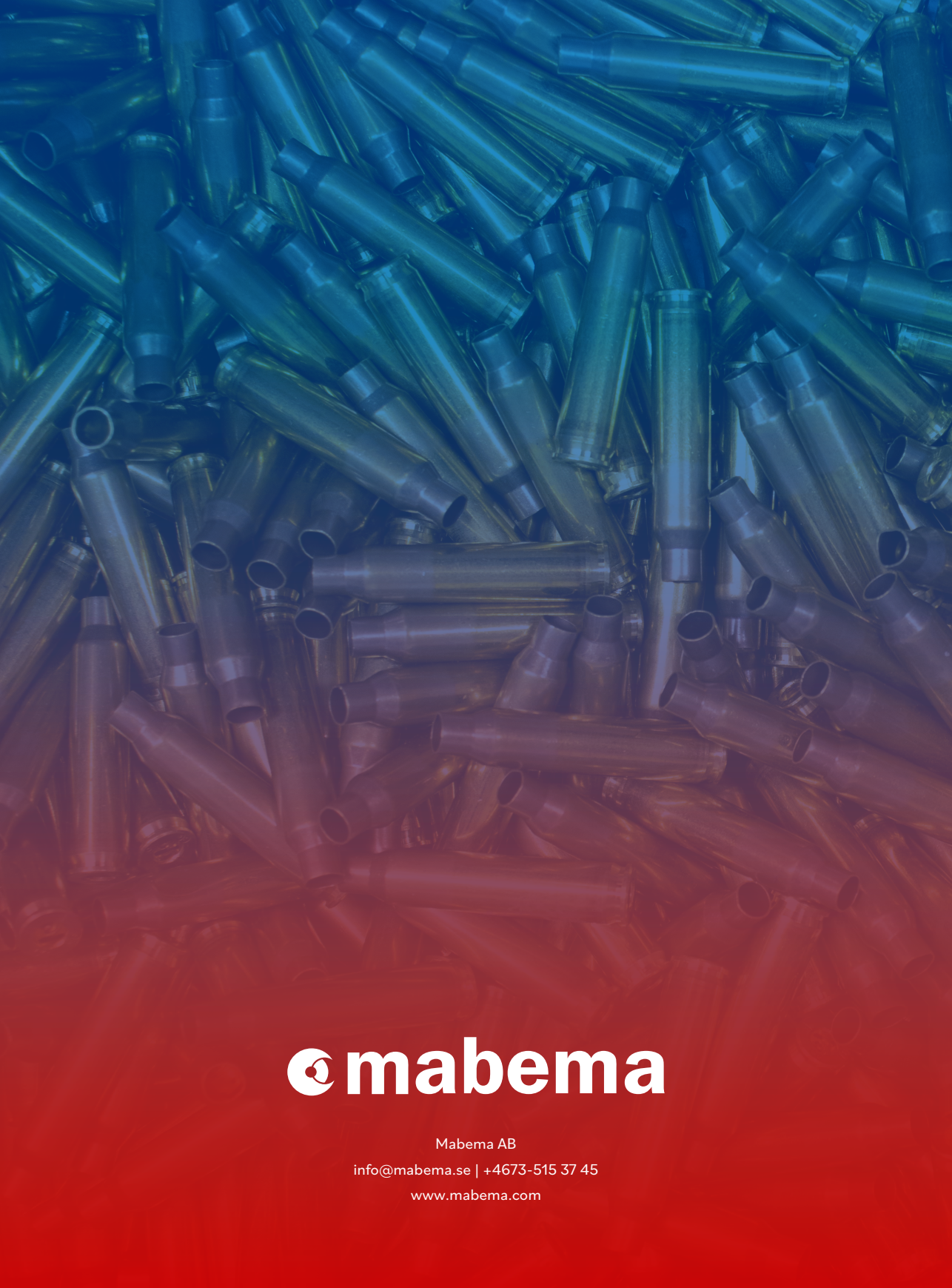
Technical Data.

Foot print (H, W, D)	2 350 x 1450 x 770 mm / 7'8.5" x 4'9" x 2'6.3"
Weight	550 kg/ 1213 lb
Noise level	Max. 70 dB
Part diameter	6 - 16 mm / 0.2 - 0.6"
Part length	15 - 100 mm / 0.6 - 3.9"
Throughput	120 parts per minute
Power requirements	390 - 490 VAC, 3 phase | 50 - 60Hz Min Amp. 11A
Air pressure	6 bar / 87 psi
Resolution	0.01 - 0.1 mm/pixel
Communication	Ethernet (TCP/IP)
Remote Access	Security Certified

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