

# Company presentation

## HEUFT SYSTEMTECHNIK GMBH

### Presentation

I will explain below what can be seen on the presentation slides and what can be said about them. We have deliberately not used much text when creating the presentation. The text should always be in the speaker's mind and the slides should not be cluttered for a presentation to be good. This is the reason for this description. Please learn it so that you bring it to life during the presentation. In this way you will get the most out of the material.

Please send an email to [marketing@heuft.com](mailto:marketing@heuft.com) should you have any questions, suggestions or do not understand something.

### Slide 1

The first slide can already be opened and shown while everyone sits down and makes themselves comfortable. A video based on the image video will be automatically started which creates a pleasant atmosphere before the actual presentation starts.

### Slide 2

We have been working on everything related to the inspection of empty and filled products in the volcanic region of Burgbrohl since 1 April 1979. Almost 1,200 employees worldwide are now carrying out our mission which started in the garage of a house: to prevent defective products in the beverage, food and pharmaceutical sectors reaching the consumer.

To sum up...

## **Slide 3**

...we are your investment in a reliable brand. For you. For your customers. And last but not least for the consumer.

## **Slide 4**

Numerous manufacturers from the beverage, food and pharmaceutical industries benefit from our decades of experience.

You can see a small selection of products and possible faults here which we can remove from the production flow with maximum safety and efficiency.

Even the strict and extremely high requirements of the pharmaceutical industry are fulfilled by HEUFT inspection devices.

Our vision is that only safe and flawless products reach the market. We work on this each and every day with all our innovative power.

You could say...

## **Slide 5**

...we are the technology leader with a touch of lifesaver. [Break]

But wait! Doesn't everyone claim to be the technology leader? Yes. But we are (as always) different!

## **Slide 6**

We have not just been building another new rejector or another new inspection device since the very beginning. We challenge existing concepts in principle. A tradition which we still maintain today and which has made HEUFT one of the most pioneering technology companies in the industry.

We always strive for maximum product safety combined with the greatest possible efficiency during the production process. Our passion for a GENUINE inspection drives us forward every day.

Let me give you four examples of revolutionary concepts which HEUFT has introduced to the filling line since early days. Many technologies, the use of which along a line was ridiculed at that time, are now standard and indispensable.

## **Slide 7**

The revolution: computers become popular.

HEUFT puts a great deal of development work and innovative spirit into the use of technology along the filling line.

In keeping with our tradition we have not simply integrated existing technology. We developed our own computer hardware specifically for the inspection tasks from the very beginning and therefore have not only confronted the challenges right down to the last detail but have also been able to achieve unprecedented accuracy and speed.

## **Slide 8**

The revolution: a networked world. The Internet takes off.

HEUFT shows pioneering spirit once again. The devices become digital and networked via the Internet. We swim against the tide and rely on the open and widespread Ethernet standard, on which the Internet is also based, instead of proprietary network standards.

Connecting the devices to the global Internet and benefiting from the resulting advantages was very easy. Thus the HEUFT *TeleService* was able to start up directly and provide companies all over the world support at the device via the Internet. At the touch of a button! Completely new evaluations could be carried out and knowledge collected in the area of PDA with the launching of the Weihenstephan Protocol.

Industry 4.0 already started for HEUFT in the nineties.

## **Slide 9**

The revolution: X-rays make the invisible visible.

We also remained true to ourselves when we started to develop equipment for the food market. First of all we reinvented the generation of X-rays before we built X-ray foreign object inspections.

We are still the only suppliers of pulsed X-rays worldwide. We obtain very sharp images with an extremely low radiation exposure at high speeds due to the extremely short X-ray flash (1 ms). This procedure can even be used for active pharmaceutical ingredients (APIs) because the minimum radiation exposure has no influence on the active ingredients. This is a fact which is presently causing concern in the pharmaceutical market because X-ray inspections were previously considered to be

unusable.

## **Slide 10**

The revolution: machines learn. Deep learning is still in its infancy.

HEUFT presents the vision of the intelligent machine which provides the operator with proactive and intelligent support with the HEUFT *SPECTRUM II* platform. HEUFT AMANDA saw the light of day at drinktec 2013 and spoke to prospective customers for the first time.

Meanwhile she is learning to listen and to enter into dialogue with the user and is on the verge of becoming intelligent. She will be able to assist from problem solving support in everyday life to preventive analysis and optimisation of the line efficiency and will learn something new every day in accordance with deep learning etc. She will integrate herself into your team and identify connections which are otherwise difficult to find.

This is our vision for the future regarding the handling and operation of filling lines. And here too we are way ahead of our time as always and have had to carry out a great deal of educational and p

ersuasive work since the start. Just as Alexa's triumphal entry into the living room, HEUFT AMANDA will one day be indispensable for the filling process.

As you can see our technology leadership is based on a number of pioneering innovations and inventions in the past and our tradition will continue to drive us forward in the future.

## **Slide 11**

THE REVOLUTION ARTIFICIAL INTELLIGENCE

### **State-of-the-art image processing with artificial intelligence**

**Artificial intelligence has already long been used in our self-developed image processing in order to clearly distinguish genuine faults from harmless structures and thus to minimise the false rejection rate during the quality inspection. It is directly integrable into the compact HEUFT *reflexx A.I.* camera and ensures full detection accuracy.**

Intelligent object detection instead of a simple brightness comparison during the image evaluation: HEUFT did not take this step just now but more than 20 years ago in order to increase the precision of the in-line inspection and to minimise the false rejection rate.

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And our image processing has been using artificial intelligence (AI) for more than ten years in order to classify the detected objects, to distinguish real faults from harmless structures such as water drops, to implement a targeted teach-in and to reduce the proportion of falsely rejected good products to far below one percent.

## **Smart image processing now also in the new**

### **HEUFT *reflexx*<sup>A.I.</sup> camera**

We have continuously optimised the HEUFT *reflexx*<sup>A.I.</sup> both on the software and on the hardware level. The smart image processing can even be integrated directly into the HEUFT *reflexx*<sup>A.I.</sup> camera which was developed especially for this purpose and which treats and evaluates its own images directly in real time. These do not have to be transferred to the respective checking or inspection device first. This raises learning-capable image analysis to a top level; the application possibilities of our modular systems reach completely new dimensions. Easily connectable to these, there is much more to be achieved in the [high-speed inspection of empty and full containers](#).

And at a significantly higher resolution. For full detection reliability with a minimum false rejection rate, the hardware and software developed in-house combines classic image processing methods with modern AI techniques such as object recognition, classification and learning functions.

### **Targeted intervention instead of a black box**

Does this leave you completely at the mercy of the AI, as if you were sitting in a self-driving car without a steering wheel and brake pedal? No! Because unlike other providers, the object evaluation does not come from an unchangeable black box with countless unknowns. Rather, humans can intervene in the machine learning in a targeted manner:

If, for example, an unknown object that has never appeared before is detected, the AI evaluates it as an error for safety reasons. However, the user always has the option of modifying the quality assessment based on his or her own experience and defining the identified structures as good and uncritical for product and packaging safety - or to have them temporarily tolerated if necessary. Without affecting the AI network or having to retrain it in a time- and energy-intensive manner, production can then continue safely even in such cases. In normal operation, everything continues to run fully automatically and highly securely.

### **More than just machine learning**

If necessary, the assessment can be easily changed at any time: That is truly intelligent AI! It does not make the expertise of people with experience in filling and packing obsolete. Instead it flows into the smart image analysis when required. In this way, each individual object can be taught into the multidimensional feature space

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fully automatically and classified individually to distinguish real defects from harmless structures such as drops of water.

HEUFT *reflexx* <sup>A.I.</sup> therefore combines artificial intelligence with human and proven image analysis methods with modern ones in order to achieve perfect inspection results and to guarantee full product and packaging quality with unrestricted productivity.

Even now the image processing developed in-house – and therefore also the HEUFT *reflexx* <sup>A.I.</sup> camera – has considerably more to offer than just simple machine learning. And the [AI development is going on continuously!](#)

## **Slide 12**

But you need (and will receive) more than a technologically superior inspection device.

HEUFT has been globally active for decades. We handle large projects and provide a fast 24/7 service on five continents with 18 locations, several partners and local service technicians. And what if you want to start production in Antarctica? Well, even then we can find a way to support you on site with our close service network.

## **Slide 13**

But the HEUFT service does not only consist of service technicians on site. Most enquiries can be answered quickly and reliably by one of our specialists around the world via the HEUFT *PhoneService* or the HEUFT *TeleService*.

## **Slide 14**

Another major advantage from HEUFT? Your investment is safe. We are familiar with every part of our machines and develop core components ourselves and therefore we can easily guarantee the long-term availability of spare parts over a decade! There are HEUFT devices which have been in operation for more than 20 years and are still running and can be supplied with spare parts. Retrofitting is also possible in many cases due to the modular HEUFT system.

Therefore your investment is not only safe but also sustainable!

## **Slide 15**

Gain a real insight into HEUFT and visit us in our Customer Center at any time. You can experience HEUFT live here and let yourself be infected by the fascination of

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inspection technology during a company tour.

## **Slide 16**

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