

Press release

FACHPACK: Simply seeing everything!

At FACHPACK 2022 from September 27 to 29, HEUFT SYSTEMTECHNIK GMBH will be presenting the latest technologies and systems for full packaging security and sustainable product and brand protection – on our self-constructed virtual device stele at booth 3C-322.

Following its trade show premiere at Anuga FoodTec 2022, it has already caused a stir atACHEMA and particularly recently at drinktec: our cyber-physic device stele from our own development and production. It is crystal clear that it will also take center stage on the HEUFT stand 3C-322 at the FACHPACK 2022 exhibition in Nuremberg. In keeping with the exhibition motto "Transition in Packaging" it combines the advantages of the classic live presentation of actually exhibited systems for inspecting the quality of full packages with the new possibilities of the ever increasing digitalization.

The new device stele illustrates the superior functionality and performance of current HEUFT devices in a unique way with a mix of physically existing and virtually animated elements and makes it possible to present several of them at the same time in a space-saving and resource-saving manner. From the glass-in-glass detection in bottles or food jars with the HEUFT *eXaminer II* XOS or the HEUFT *eXaminer II* XAC respectively to the reliable identification of metallic foreign bodies in filled tins and cans with the slim HEUFT *eXaminer II* XS lateral inspector: practically every HEUFT cyber-physical system of the new generation can be demonstrated in detail on one and the same cyber-physical presentation medium.

This applies for example to the advantages of the pulsed X-ray technology which has been optimized once again for simply more detection accuracy during a markedly extended lifetime. And also for the HEUFT *reflexx A.I.*, the latest version of our self-developed hardware

and software for real-time image processing with artificial intelligence for a considerably reduced proportion of false rejections.

The latter is not only used in the further developed X-ray inspection systems for the detection of foreign objects but of course also in HEUFT devices for the optical inspection of full containers which can also be displayed realistically and examined intensively on the virtual device stele.

The right solution for the most varied of applications and requirements in terms of product quality, packaging safety and brand protection will certainly be seen at FACHPACK 2022 – on our cyber-physical equipment control panel at the HEUFT stand 3C-322!

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HEUFT *eXaminer*^{II} XOS: Smart full bottle inspection

The HEUFT *eXaminer*^{II} XOS sets the standards during the full bottle inspection with further developed pulsed X-rays, smart AI and sophisticated optics – and detects glass in glass just as reliably as, for example, scraps of paper and even transparent film in the beverage with a minimal false rejection rate.

The HEUFT *eXaminer*^{II} XOS ensures lasting consumer and brand protection with a high output – and fulfils the requirements for the use of the best available technology which are the basis for certification according to standards such as the IFS Food. This is certainly to be found in the modular system for inspecting full bottles: it is the only one of its kind to combine a sophisticated high-performance optical system with pulsed X-rays exclusively available from HEUFT and the new deep learning function of the HEUFT *reflexx*^{A.I.} image processing system for de-noising the X-ray shots for even more detection reliability when detecting glass in glass.

The X-ray tube and generator are completely developed and designed in-house. Current innovations during the generation of millisecond-short X-ray pulses, image conversion and processing ensure, on the one hand, more coverage: No floor area remains unexamined. On the other hand, the new generators and digital full-field image converters further increase the sensitivity of detection. Even particularly small or weakly absorbing objects, such as extremely flat or needle-shaped glass splinters at the bottom of the full bottle, are thus even more clearly visible.

The AI supported HEUFT *reflexx*^{A.I.} image processing also contributes to this. Among other things it compensates for variations in the glass thickness at the bottom of the bottle and removes inhomogeneities, image noise and artefacts from the X-ray shots smartly. The smallest high-density foreign bodies are thus detected even more clearly. Real defects can be distinguished even more reliably from presumed ones;

the false rejection rate during full container inspection is drastically reduced – and with it the unnecessary waste of product and packaging.

At the same time, the lifetime of the X-ray modules has increased significantly. Filaments, for example, are even redundantly integrated: if one of the two should fail, the other immediately takes over without manual intervention. The risk of unforeseen line stops and production stops due to acute maintenance requirements is thus significantly reduced.

And where conventional X-ray scanners can no longer keep up because the filling line is running too fast the unique pulsed X-ray continues to score with detection power independent of speed at the lowest level of radiation: even when 72,000 full glass bottles have to be inspected every hour the new full-field image converters in the HEUFT *eXaminer^{II}* XOS receive and process every single X-ray flash fast enough. This results in reliably sharp X-ray images even in high-speed operation which are processed, denoised and evaluated by the HEUFT *reflexx^{A.I.}*.

In addition to this a new type of rainbow illumination technology can now be integrated in order to further optimize the optical foreign object inspection and to detect transparent glass fragments in clear glass bottles with colorless contents even more reliably. In addition the HEUFT *eXaminer^{II}* XOS also detects inclusions, cracks and defects in the container glass as well as, amongst other things, mould, scraps of paper or transparent film in the drink using high-performance cameras and the latest version of learning-capable real-time image processing.

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HEUFT *eXaminer*^{II} XS: more performance in the smallest of spaces

The compact HEUFT *eXaminer*^{II} XS opens up completely new perspectives for the gentle and precise detection of foreign objects at the end of the line with more flexibility in the combination, arrangement and alignment of performance and lifetime optimized pulsed X-ray technology.

The slim turnkey solution for the pulsed sideways X-ray inspection of cans, doypacks, squeeze bottles or carton packages achieves full detection reliability in a very small space: dangerous foreign objects with a high density in the product are identified gently and precisely. Modularly expandable, the compact system of the new generation can be equipped with one or two X-ray flashers – depending on the height of the full packaging to be inspected – to ensure that the inspection always covers the entire filling volume.

With two X-ray modules, precision is increased in the detection of high-density objects such as metal particles or hard plastic fragments. In addition, this enables a complete inspection of particularly large-format containers with a straight view of the sensitive fill line area. If only a base inspection is required, as is the case with liquid products in cardboard packaging, this packaging area alone can now also be specifically inspected with only one sideways X-ray flasher – thanks to an "unfolded" base view implemented by the intelligent HEUFT *reflexx*^{A.I.} image processing. Small foreign objects lying flat at the bottom of the packaging can be detected even more clearly this way.

A new option for particularly high full packages whose complete volume has to be examined is a special oblique alignment during the X-ray with only one detection unit. This makes it possible to identify foreign objects not only at the bottom, but also everywhere else in the packaging. A new type of full-surface image converter provides increased sensitivity

and ensures that each individual X-ray pulse covers a significantly larger container area than before.

Also perfected: The pulsed X-ray technology itself which is exclusively available from HEUFT and which generates X-ray flashes of milliseconds instead of a continuous beam and only emits these when they are really needed. Each individual X-ray pulse now penetrates considerably larger packaging volumes and product quantities than before so that the gentle and precise detection of foreign objects e.g. even in oversized gastro cans is successful. And all this with a significantly optimized lifetime for fewer downtimes in the filling and packaging process: before a total failure of important components can occur, the user is informed in good time so that he still has enough time for preventive maintenance. Essential X-ray components are even redundantly integrated – should one fail the other takes over directly.

The higher-level HEUFT *SPECTRUM*^{II} control unit of the HEUFT *eXaminer*^{II} XS to which many other detections can be connected – among other things for the precise verification of product markings – is highly automated. For example, the height and orientation of the upper X-ray flash module automatically adapts to the changed container format when there is a change of type or program. The HEUFT *NaVi* user guidance system provides the user with an audiovisual step-by-step assistance which not only makes type changes simple.

All this makes the compact HEUFT *eXaminer*^{II} XS a genuine turnkey solution for fully covering foreign object detection at the end of the line.

Press release

HEUFT *eXaminer II* XAC: Optimized glass-in-glass detection

The HEUFT *eXaminer II* XAC increases the sensitivity, coverage and reliability of the pulsed X-ray inspection for the precise glass-in-glass detection with new components optimized for a longer lifetime. The end-of-line system in the HEUFT *CleanDesign* inspects even oversized products without gaps and with high precision.

The HEUFT *SPECTRUM II*, its overall highly automated device platform with audiovisual HEUFT *NaVi* user guidance, already provides considerably more performance when detecting and rejecting full food jars which are contaminated with dangerous glass splinters. In addition compact full-field image converters now increase the bandwidth, speed and precision of the pulsed X-ray inspection with the further developed HEUFT *eXaminer II* XAC. Even oversized containers can be inspected without gaps. At the same time the size of the foreign objects to be reliably detected is halved with line outputs of up to 1,200 products per minute.

The compact new image converters replace the camera and image intensifier technology previously used. Almost square and optimally arranged, they expand the sensitive detection area with significantly increased resolution. Even the edge areas of the brilliant X-ray images remain free of distortions and aberrations.

The X-ray parameters adapted to the new image converters reduce the already unrivalled low radiation in the double bottom and 360° sidewall inspection. In contrast to conventional scanning, it is emitted in the form of X-ray flashes that are only a thousandth of a second short. And only when there is actually something to inspect. At high belt speeds, the flashes prevent motion blur, which can impair detection reliability. In addition it enables a static inspection: the product can be precisely

inspected – for example for internal quality assurance – even when the conveyor is stationary.

This pulsed X-ray technology which is exclusively available from HEUFT makes the worldwide unique use of the compact image converters in inspection systems for the food industry possible in the first place. As a result of this as well as thanks to further developed high voltage and lifetime optimized X-ray components the HEUFT *eXaminer II* XAC now simply offers more space and flexibility with a considerably reduced total cost of ownership (TCO) – for example for the reliable inspection of containers of different heights. As the generators no longer require cooling the risk of contamination of the product to be inspected due to possible leaking coolant is eliminated.

Its HEUFT *CleanDesign* predestines the HEUFT *eXaminer II* XAC for use in hygienically sensitive areas. Sloping surfaces make cleaning easier and prevent the accumulation of stubborn dirt. Special channels and openings allow the liquid required for cleaning to drain off completely. Dangerous germs and bacteria thus have no surface to attack.

The considerably increased automation and computing power of its HEUFT *SPECTRUM II* head with self-explanatory HEUFT *NaVi* user guidance makes the safe operation of the HEUFT *eXaminer II* XAC simply easy. The HEUFT *reflexx A.I.* teach-in capable real-time image processing clearly distinguishes between harmless product inhomogeneities and critical faults. And the new X-ray components, some of which are even redundantly integrated, increase the longevity of the end-of-line system which is predestined for the glass-in-glass detection. The result: A new dimension in bandwidth, detection and reliability in pulsed X-ray inspection for reliable glass-in-glass detection.

Press release

HEUFT *eXaminer^{II}* XB: a more powerful top-down inspector

The enhanced top-down inspector is the only system of its kind to combine lifetime-optimized pulsed X-ray technology with new types of image converters. The HEUFT *eXaminer^{II}* XB thus achieves previously unattained dimensions in terms of bandwidth, detection accuracy and operational reliability when detecting the most varied foreign objects in pouches, flow packs or thermoformed trays.

Equipped with novel full-field image converters for the first time the HEUFT *eXaminer^{II}* XB makes the detection of solid foreign objects made of glass, metal or plastic even more reliable, easier and more precise with a unique pulsed X-ray inspection: the size of the foreign objects which can be reliably identified has been halved.

The compact image converters expand the sensitive detection area of pulsed X-ray inspection with significantly increased resolution: even the edge areas of the brilliant X-ray images remain free of distortions and imaging errors. This means that even products of larger formats can be inspected without gaps and with high precision.

The X-ray parameters adapted to the new image converter technology reduce the already unrivalled low level of radiation. Unlike conventional scanners, it is emitted in the form of X-ray flashes that are only a thousandth of a second short. And only when there is actually something to inspect. At high belt speeds, the flashes prevent motion blur, which can impair detection reliability. In addition, it enables static inspection: the product can be inspected precisely – for internal quality assurance, for example – even when the conveyor is at a standstill. The multiple flash option realizes the complete inspection of particularly long products.

The pulsed X-ray technology which is exclusively available from HEUFT

makes the worldwide unique use of the compact image converters in inspection systems for the food industry possible in the first place. Newly developed X-ray tubes from our own production as well as sustainably optimized generators and high voltage components further increase the detection and operational reliability during the top-down inspection. Before a total failure of important components can occur, the user is informed in good time so that he still has enough time for preventive maintenance. Essential X-ray components are even integrated redundantly – should one fail the other takes over directly.

In addition the HEUFT *eXaminer II XB* now offers considerably more space and flexibility when adapting the conveyor for the reliable inspection of products of different heights. As the new X-ray generators no longer require cooling the risk of contamination of the product to be inspected due to possible leaking coolant is eliminated. A special technology for the self-adjusting tightening of the easily exchanged belt and the optimized drive mechanics of the transport belts reduce the need for manual intervention and simplify the maintenance of the system constructed in the hygiene-optimized HEUFT *CleanDesign*.

The high level of automation and computing power of its HEUFT *SPECTRUM II* head with self-explanatory HEUFT *NaVi* user guidance makes the safe, non-manipulable operation of the HEUFT *eXaminer II XB* simply easy. The HEUFT *reflexx^{A.I.}* teach-in capable real-time image processing clearly distinguishes between harmless product inhomogeneities and critical foreign objects or defects. The result: a new dimension in terms of bandwidth, resource efficiency, detection and reliability during the gentle top-down inspection with lifetime-optimized pulsed X-ray technology.

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HEUFT *eXaminer^{II} XT*: Perfect pipeline inspection

The pulsed X-ray technology in the highly automated HEUFT *eXaminer^{II} XT* has now been optimized once again for the reliable identification of foreign objects in unpacked product mass at a reduced total cost of ownership (TCO).

Thanks to further developed pulsed X-ray and a computing power at HEUFT *SPECTRUM^{II}* level the compact pipe inspector not only offers more performance and precision in the gentle detection of foreign objects but also in the rejection of the contaminated partial quantity. With perfected generators and large-area new full-field imagers, the X-ray flashes cover an even larger area than before. In addition, they now penetrate larger volumes of highly absorbent product mass such as sausage meat just as completely as syrup or yogurt to identify metal particles, glass particles, stones or bone fragments even before the filling and packaging process begins.

Even when the transport speed in the pipeline is very high or fluctuates the further developed pulsed X-ray ensures clear detection images without motion blur at minimal radiation which make foreign objects of high density clearly visible and distinguish them clearly from harmless product inhomogeneities with the aid of special filters during the HEUFT *reflexx^{A.I.}* real-time image processing.

And the compact, easily accessible construction in the hygiene and maintenance-optimized HEUFT *CleanDesign* together with the strong performance of the highly automated HEUFT *SPECTRUM^{II}* device platform ensures the highest degree of accuracy in the targeted rejection of the part contaminated with dangerous foreign objects: instead of being positioned horizontally the pipeline which is scanned by unique X-ray flashers is now positioned vertically. This means that the contaminated mass can simply flow down through a valve, while the product free of foreign bodies continues to be filled and packaged.

Type and program changes are carried out fully automatically and without time-consuming recalibration. The HEUFT NaVi audiovisual user guidance supports each user individually and step by step. And also during the regular self-tests for checking the detection performance in an innovative procedure. Up to four carbon fibre fingers prepared with different test objects are moved directly into the beam path for this purpose so that the detection reliability can be checked under real production conditions and documented without gaps.

The result: a space-saving, gentle and precise foreign object detection at a genuine HEUFT level even before the filling and packaging process starts. With the new generation pipe inspector it is possible to realize exactly what is becoming more and more important in the supply chain with a markedly increased life cycle of all the X-ray components: the delivery and processing of bulk goods which are already pre-inspected and free of foreign objects. This minimizes the risk of metal particles, glass splinters or stones only being found in the finished packed end product and at the same time forms effective protection against wasting life and packaging material.

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HEUFT *squeezer II*: Flexible leakage check

The HEUFT *squeezer II* offers the necessary performance and a flexibly extendable inspection path in order to identify even the smallest leaks and to reliably reject PET bottles which are affected.

Detection reliability up, false rejection rate down: The self-explanatory system simply achieves more during the leakage check of filled PET bottles simply due to the latest version of the highly automated HEUFT *SPECTRUM II* device platform.

The inspection path of the new HEUFT *squeezer II* can be flexibly extended depending on the application for the even more precise detection of stress cracks and micro leaks which are hardly visible to the naked eye: The transport belt which guides the bottles and pressurizes them in an exactly dosed manner for the comparative fill level check can now be integrated in different lengths for this purpose. At the same time, the sensitivity of the sensor system for precisely measuring the internal pressure of the full containers has been further increased.

The position of all detection modules and the height and throughput width of the servo-controlled belt drive adapt automatically to the changed container format. The ergonomic construction in the hygiene-optimized HEUFT *CleanDesign* makes the operation and cleaning of the further developed HEUFT *squeezer II* easy and convenient. The individually adjustable new gooseneck panel, for example, creates more flexibility. The user always has the tidy touchscreen with the HEUFT *NaVi* user interface in view.

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Company profile: HEUFT is SYSTEMTECHNIK

Quality, safety and efficiency: this is what matters when filling and packaging food, drinks and pharmaceuticals! The modular checking and inspections systems from HEUFT SYSTEMTECHNIK GMBH put these key factors into practice simply and effectively. They ensure, during maximum productivity, that only perfect products reach the market.

Unique camera, X-ray and image processing technologies for a precise empty and full container inspection, trend-setting labelling technology and smart tools for container flow optimisation, production data acquisition and performance analysis safeguard product quality and line efficiency sustainably!

A consistent modular design principle with a cross-system control unit for the most varied technologies, procedures and modules generates, together with a high component equality, the correct automation solution for every application.

Those who decide in favour of a user-friendly HEUFT system can depend on a high level of operational reliability. Competent support is always guaranteed with the long-term availability of spare parts and the 24/7 on call service.

This concept keeps the globally operating company on a dynamic course of growth. In the meantime the number of employees has long since exceeded the 1,000 mark. Its own locations in 18 different countries and a comprehensive network of service bases on all five continents meet the huge demand for the HEUFT systems which are manufactured exclusively in Germany.

The result: more safety, quality and efficiency during the filling and packaging of food, drinks and pharmaceuticals. HEUFT knows how!

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Fact sheet

Company:	HEUFT SYSTEMTECHNIK GMBH
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Head office:	Burgbrohl, Rheinland-Pfalz, Germany
Other locations:	Argentina, Australia, Austria, Brazil, China, Denmark, France, Great Britain, Hong Kong, India, Italy, Mexico, the Netherlands, Russia, Spain, Thailand, USA
Founded on:	1 April 1979
Employees:	more than 1,200 in the HEUFT group
Industry:	special mechanical engineering
Product range:	inspection, quality control, labelling, rejection, transport and IT systems for the food, beverage and pharmaceutical industries
Tasks:	returned case inspection, bottle sorting, empty container inspection, fill management, full container inspection, foreign body detection, rejection systems, transport optimisation, conveyor control systems, labelling technology, full case inspection, code reading, label inspection, closure inspection, production data acquisition and line analysis
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