

Press release

drinktec 2022: seeing what's behind!

Digitalization, artificial intelligence and sustainability: these are the trend topics at drinktec from 12 to 16 September in Munich. Crystal clear that HEUFT SYSTEMTECHNIK GMBH will be exhibiting the appropriate solutions at Stand B4.319/513! The highlights include the HEUFT *reflexx*^{A.I.}, a hardware and software developed in-house for the smart image processing which has now reached the next stage of development.

More than just looking over it: The AI for smart image processing in the filling and packaging process not only filters out water drops on the full bottle, for example, but now also makes visible what is behind them. Together with superior optics and sensor technology as well as unique X-ray and digitizing applications, critical defects are detected more reliably and distinguished even more clearly from harmless deviations.

This increases detection reliability, minimizes the false rejection rate, and thus puts a lasting end to the senseless waste of valuable products and packaging materials: Only what has to go out is rejected!

So whether it is the all-surface empty bottle inspection, more detection and failure reliability during the unique pulsed X-raying for the detection of glass in glass in full containers with the HEUFT *eXaminer*^{II} XOS or smart lighting, camera and image processing solutions for the gapless tethered cap and adaptive label inspection: you will find what you are looking for at the HEUFT exhibition stand!

The highlights include the HEUFT *reflexx*^{A.I.}, a hardware and software developed in-house which combines classic image processing methods with modern AI procedures for detecting, classifying, teaching and filtering out the most varied objects but also includes human expertise for their evaluation. This means that the user is not helplessly at the mercy of the AI, but can also modify its quality judgment during the process if necessary.

In addition, among many other things, pioneering labelling technologies, the latest solutions for end-to-end track & trace, and innovative sorting and rejection systems will be presented at booth B4.319/513 – and real visions of the future that will redefine the state of the art for in-line quality assurance in the filling and packaging process.

Press release

Real-time image processing with artificial intelligence

In order to clearly distinguish genuine faults from harmless structures HEUFT's image processing has already been using artificial intelligence (AI) for a long time. The HEUFT *reflexx*^{A.I.} has been consistently developed further and once again increases the detection accuracy and minimizes the false rejection rate.

Intelligent object detection instead of a simple brightness comparison during image evaluation: HEUFT already took this step more than 20 years ago in order to increase the precision of the in-line quality assurance and to reduce the proportion of falsely rejected good products. For over ten years the image processing from its own development and production has been using AI in order to classify the detected objects, to distinguish genuine faults from harmless structures, to implement a targeted teach-in and to reduce the false rejection rate to well below one percent. The HEUFT *reflexx*^{A.I.} has been continuously developed further and now even realizes a denoising of X-ray images based on deep learning with brand new hardware in order to further increase the detection accuracy during the foreign object detection. And during optical quality inspection, the smart image processing now not only filters out water drops on the bottle, but even makes visible what is behind them.

From now on it can also be integrated into the HEUFT *reflexx*^{A.I.} camera with adaptive LED illumination which has been developed in particular and which processes and evaluates its own images directly in real-time. These do not first have to be transferred to the control or inspection equipment. Simply connectable to these, the camera can do much more during the high-speed inspection of empty and full containers.

And this goes while significantly increasing the resolution. The hardware and software developed in-house combines classic image processing methods with modern AI methods such as object recognition, classification and learning functions. Nevertheless, you are not

completely at the mercy of the AI, as if you were sitting in a self-driving car without a steering wheel and brake pedal. Because unlike with other providers, the object evaluation does not come from an unchangeable black box with countless unknowns. Instead, humans can intervene in machine learning in a targeted manner:

If, for example, an unknown object that has never occurred before is detected, the AI evaluates it as an error first, to be on the safe side. However, the user always has the option of modifying the quality assessment based on his own experience and defining the identified structures as good and uncritical for product and packaging safety – or to have them temporarily tolerated during the process if necessary. Without affecting the AI network or having to undergo time- and energy-intensive retraining, production can then continue safely even in such cases. In normal operation, everything runs fully automatically and highly securely. So if necessary, the assessment can be easily changed at any time: The expertise of skilled people with experience in filling and packing does not become obsolete. Instead, it is incorporated into the smart image analysis during the process. In this way, each individual object can be taught into the multidimensional feature space fully automatically and classified individually to distinguish real defects from harmless structures such as water droplets. The AI now even filters these out and reconstructs what is behind them.

In this way the HEUFT *reflexx* ^{A.I.} combines artificial intelligence with human and proven image analysis procedures with modern ones in order to increase the reliability of detection and to further minimize the proportion of falsely rejected good products.

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All-surface empty bottle inspection plus X

One thing is certain: combined with high-performance optics and intelligent real-time image processing HEUFT pulsed X-rays increase the precision of the all-surface empty bottle inspection and reduce the false rejection rate at the same time. The new HEUFT *InLine*^{II} IX is an update of the all-in-one system including consistently further developed X-ray technology, HEUFT *reflexx*^{A.I.} cameras and other innovations for even more detection reliability in a new design.

The predecessor already makes three-dimensional glass fragments of a size of only 2 x 2 x 2 millimetres at the bottom of the bottle detectable with exclusive X-ray flash technology even when they are surrounded by residual liquid whose surface tension weakens the contrast and blurs the edges of the dangerous foreign bodies during the camera-based inspection. The detection performance during the identification of cuboidal, plate-shaped and needle-shaped glass particles in bottle color can thus be demonstrably increased by up to 29 percent, while the false rejection rate tends towards zero! And the identification of metal and air inclusions as well as cracks in the glass or shell-shaped fractures and chipping at the outer base edge is much more reliable with the X-ray-supported all-surface empty bottle Inspector (ASEBI) than during a purely optical inspection of bottles even before filling.

Thanks to lifetime-optimized new X-ray tubes and generators from our own development and production with type approval as well as digital full-field image converters the sensitivity and reliability of the radiometric detection is increased even further with the HEUFT *InLine*^{II} IX which will celebrate its exhibition premiere at drinktec 2022. New HEUFT *reflexx*^{A.I.} cameras with integrated adaptive LED illumination and real-time image evaluation for the optical base and neck finish inspection as well as for the distortion-free quadruple sidewall inspection with doubled resolution

simultaneously increase the precision of the identification of transparent film or other foreign objects and low density contaminants in as well as inclusions, scratches, cracks, chips and scuffing on the container.

Just as with the HEUFT *InLine*^{II} *IS* which sets the standard for the empty bottle inspection without X-ray support, completely new camera technologies corresponding with each other for different applications can now also be integrated into the modular system: for example during the ACL bottle inspection the HEUFT *InLine*^{II} *IX* not only verifies the presence of Applied Color Labels / Applied Ceramic Labels. Thanks to the HEUFT *reflexx*^{A.I.} image processing with filters based on artificial intelligence these can also be faded out in order to examine the areas in between without any gaps. A brand-new feature is the smart special optics, which can now even be used to precisely inspect each individual ACL itself in order to find, among other things, soiling, misprints, or labels, logos, and colorations of other types in this area as well.

The base, underchip, thread, mouth and sealing surface inspections also provide a clear plus in detection accuracy thanks to the innovative high performance optics and the HEUFT *reflexx*^{A.I.}. Even the inner finish can now be completely inspected with the HEUFT *InLine*^{II} ASEBIs. And the patented rainbow illumination makes the smallest chipping and shell-shaped fractures at their outer edge better visible.

Open, easily accessible, frameless and tableless the optimized HEUFT *CleanDesign* minimizes the cleaning and maintenance effort. All the detection modules up to the HEUFT *fluid* residual liquid detection which previously had to be placed outside are now fully integrated. And they are safely enclosed and adjustable by motor. Newly available protective foils make the panes in the device dirt-repellent and considerably more robust. Because the passage width of the belt drive also adjusts automatically for transport and fine alignment of the empty bottles, type and program changes are very easy.

Despite this, the linear system is extremely compact and can be easily integrated into existing bottling lines. The new gooseneck panel can be individually adjusted so that the user always has a good view of the tidy touchscreen interface with the HEUFT *NaVi* audiovisual user guidance.

Based on the latest release of the network-capable HEUFT *SPECTRUM*^{II} platform the HEUFT *InLine*^{II} *IX* also achieves a further increase in automation, computing power and precision during targeted product tracking. Above all it is now the only one of its kind to feature the pulsed X-ray which has been consistently developed further.

Particularly when it comes to the reliable detection of glass in glass this not only offers considerably more in comparison with a purely optical inspection. A higher detection reliability with a sustainably reduced false rejection rate can also be expected compared with the ASEBIs with pulsed X-rays which have been available from HEUFT up to now. So it is really good that HEUFT has persistently stuck to this unique technology and consistently developed it further. The soon-to-be-integrated AI of the new generation even filters out drops of water on the empty bottle and reconstructs what is behind them!

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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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Intelligent empty crate inspection of the new generation

The new HEUFT *SPECTRUM*^{II} *LKX* achieves a new level of detection and operational reliability during the empty crate inspection on a current platform with innovative technologies for the precise localization and evaluation of foreign objects and defects.

Returnable reusable empty crates must be safely reusable and free from foreign objects, defects and risks of injury. The new generation empty crate inspector checks this immediately after the unpacker. For the first time on a HEUFT *SPECTRUM*^{II} basis it achieves a completely new level of performance, automation and operational reliability.

The trade fair novelty offers an innovative three-stage classification for the improved detection of foreign objects in the compartments of empty drinks crates: the HEUFT *SPECTRUM*^{II} *LKX* first identifies them with exactly the right optics in each case using the incident and transmitted light method and smartly distinguishes them from each other on the basis of their size, color and shape before a 3D laser scan additionally measures their height profile.

This optimizes the containment, localization, and evaluation of identified objects and ensures that only those crates enter the production stream that can be safely reused and easily filled with new beverage bottles. Those for which this is not the case are reliably rejected by special systems from the HEUFT *case rejector* range:

The HEUFT *maxi-flip* and the HEUFT *maxi-laner* even realize a weight-dependent control so that heavier cases are each conveyed just as far onto a parallel conveyor as lighter ones. And a completely newly developed rejection system even distributes them to different lanes in a fault-specific manner.

This also applies to unusable crates with defective bases which the HEUFT *SPECTRUM^{II} LKX* detects by means of a camera. It additionally inspects the edges of the secondary packaging material and finds cracks, damage or even sharp-edged chips among other things which in the worst case can injure the hands when lifting and carrying. The HEUFT *reflexx^{A.I.}* image processing ensures full detection reliability and minimal false rejection rates.

The highly automated HEUFT *SPECTRUM^{II}* platform with HEUFT *NaVi* user guidance creates full operational reliability during the inspection of up to 7,200 empty drinks crates per hour and realizes quick, easy sorting changes: all the parameters are adjusted automatically, the height and position of the detection units are motor-adjusted and the user is provided with comprehensive audio-visual step-by-step assistance.

Together with the novel technology for the three-stage detection and classification of foreign objects the HEUFT *SPECTRUM^{II} LKX* reaches the next stage in the development of intelligent empty crate inspection.

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Brand pure empties

The right equipment is required for the efficient sorting of empty bottles in a returnable line. And a consistent sorting concept with a line layout optimally adapted to this. The technology leader offers everything from a single source with the new HEUFT *SPECTRUM*^{II} SX and a great deal of know-how.

A lack of empties, too much mixing in the bottle pool and a high sorting effort threaten the efficiency and productivity of complete bottling lines. The remedy is a highly automated, state-of-the-art empty bottle sorting system directly on site, which minimizes manual effort. And a consistent sorting concept with targeted adaptation of the line layout to enable the empties to be conveyed gently, discharged safely while standing upright, and distributed precisely along many routes, even when space is limited.

The leading supplier can not only offer decades of experience in line optimisation in this respect but also the new HEUFT *SPECTRUM*^{II} SX empty bottle sorting system, the HEUFT *conveyor* belts, the HEUFT *synchron* conveyor control system and solutions for the upright rejection of foreign and faulty bottles.

The new empty bottle sorting system with the innovative HEUFT *preWash*^{II} module creates brand purity in the bottle cellar. Prior to this an infeed check removes the causes of faults such as bottles lying on their sides, broken and crooked bottles which cannot be conveyed and rejected upright and thus can cause backlogs, blockages and line stoppages.

Unwanted production stops are also imminent if the washing machine breaks down and heavily contaminated bottles affect the caustic concentration to such an extent that cleaning performance is no longer guaranteed. 20 to 30 millilitres of caustic solution in a single bottle is enough to cause this. For this reason the new residual liquor detection of

the HEUFT *SPECTRUM*^{II} SX now also differentiates between colors so that bottles which still contain yellowish beer residue for example are passed through as washable while those with red diesel or green liquor are rejected immediately.

However, the main features of the new HEUFT *preWash*^{II} module in the HEUFT *SPECTRUM*^{II} SX empty bottle sorting system include on the one hand the contour inspection using the transmitted light method which only lets through containers in the correct format which is currently being handled and at the same time also detects and rejects those of these which are highly contaminated, scuffed or contaminated with foreign objects.

On the other hand, it also reliably identifies non-specified ACL labels and embossings and uses them as a criterion for sorting out foreign bottles by means of a high-resolution color camera inspection in reflected light. Even glue residues from self-adhesive labels which cannot be removed in the washing machine are now reliably detected with this.

Ideally the HEUFT *SPECTRUM*^{II} SX is positioned directly in front of it in order to distinguish between glass and PET bottles for example. With several rejection systems the upright rejection is even fault-specific: PET bottles which do not belong to the portfolio are for example diverted upright by the first HEUFT *LAMBDA-K* diverter, foreign glass bottles by the second, pool bottles of the wrong size by the third and heavily soiled ones by the fourth.

The new HEUFT *SPECTRUM*^{II} SX realizes type and format changes fully automatically; its detection and rejection modules adapt to the changed format automatically. The audiovisual HEUFT *NaVi* user guidance not only provides the user with comprehensive step-by-step assistance in this respect.

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Learning-capable label inspection

The new HEUFT *FinalView*^{II} LBL generates an all-round panoramic view of each individual bottle for a complete label inspection. It now also realizes a genuine teach-in of new labels in order to ensure short changeover times for full line availability even in case of high variety of types.

As important information carriers and target-oriented equipment elements for the recognition value of brands and varieties at the point of sale, labels must not be missing from any full bottle. They should also be applied exactly where they belong – not crooked and slanted, but accurately and in a particularly straight position. Only in this way does the end product offer an attractive appearance which encourages a purchase.

The HEUFT *FinalView*^{II} LBL thus checks the presence and correct positioning of all labels. Four securely housed high-performance cameras on two levels each generate an undistorted 360° panoramic view of each individual full bottle in combination with adaptive LED lighting and intelligent HEUFT *reflexx*^{A.I.} real-time image processing on which unlabelled empty spaces are just as clearly recognizable as incorrectly positioned or skewed body, back or neck labels.

Labels with off-brand coloring, wrinkles, tears, defects, missing design elements, or a poor print image are identified just as reliably. The system even reliably distinguishes labels that differ from one another on the basis of just one tiny feature. Non-critical features such as slight print offset can be taught as good objects using the intelligent HEUFT *reflexx*^{A.I.} technology so that they no longer lead to rejection.

The latest version of the AI-supported image processing now even realizes a genuine teach-in of newly introduced labels. A reference image file only has to be digitally transferred to the HEUFT *FinalView*^{II} LBL

whilst the bottle shape is known and the system has already memorized its typical characteristics so that incorrectly positioned, crooked or defective new labels are immediately detected just as reliably as labels of a different type which deviate from the intended appearance of the original due to only one design element for example.

The homogeneous LED illumination ensures full inspection quality even with different illumination angles and new design details such as metallized labels. The intelligent HEUFT *reflexx*^{A.I.} image processing system rectifies, optimizes and analyzes the detection images – and compares them with the taught reference image in real-time. The commissioning of new types and the adjustment of the label inspection to them therefore works just as quickly and simply as the automatic changeover from one to the other. Downtimes are minimized, and line availability is noticeably increased.

The HEUFT *SPECTRUM*^{II} control unit of the HEUFT *FinalView*^{II} *LBL* offers an unprecedented degree of automation and support for the user for quick sorts and program changes: the height and alignment of the two camera levels automatically adapts to the changed container format. The same applies to the individually controllable LEDs so that the optimum harmonious illumination is achieved for each type. The HEUFT *NaVi* user guidance system provides the user with audiovisual step-by-step assistance which not only makes changing sorts simply easy.

Connected to the HEUFT *SPECTRUM*^{II} *VX* fill management system a precise fill level check including fill valve monitoring or even a closure check can be carried out in the same operation in addition to the detailed label inspection.

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Further developed closure inspection

The HEUFT *FinalView*^{II} CAP raises the in-line inspection of closures and their safety elements to a new level. The further development shows its strengths particularly during the inspection of new types of tethered caps and the detection of dangerous cuts in metallic screw caps.

Inspect bottle closures completely and simply find all critical faults! The HEUFT *FinalView*^{II} CAP achieves this even with new types of tethered caps which will become obligatory for non-returnable PET bottles throughout the EU in less than two years.

The smart HEUFT *reflexx*^{A.I.} image processing realizes a targeted teach-in of new features such as the unusually large gap between the cap and the tamper-evidence band of rotationally symmetrical tethered caps so that the full containers concerned are no longer rejected as faulty.

Specific software upgrades keep the false rejection rate at the lowest possible level even in the case of asymmetrical tethered caps. This means that they can be inspected with truly seamless and high precision. In addition, the enhanced software masters another challenge during the detection of caps that are too high and may be leaking. It now succeeds reliably from an over height of just 0.5 millimetres.

Also enhanced: The proven cap angle detection. It verifies that tethered caps and other screw caps are always correctly aligned and that they are actually screwed on as far as they should be when capping.

For mouths which are made of darker, less transparent rPET HEUFT has integrated a new special light into the compact unit for the closure inspection of up to 72,000 PET bottles per hour directly on the running conveyor. Defective tamper evidence rings can thus be easily detected even under such conditions.

In addition the HEUFT *FinalView*^{II} CAP now also reliably detects tiny cuts in metallic screw caps. The slim detection unit combines the precise roll-on, contour and profile inspection with a new type of transmitted light illumination and image evaluation for this purpose. The particular illumination makes cuts light up as bright pixels in the dark 360° view of the complete screw cap wall so that they can be specifically identified as faults by the intelligent HEUFT *reflexx*^{A.I.} image processing. Even at nicks and cuts of a size of less than one millimetre this is now reliably achieved.

This also applies to the highly precise top-down and 360° lateral inspection of a wide range of closures in reflected light which reveals, amongst other things, colors and logos of different types, defects and deformations of the closure wall or torn tamper-evident rings.

Compared with previous HEUFT solutions for cap inspection the HEUFT *FinalView*^{II} CAP offers twice as many color cameras and six times the resolution. The maximum diameter of closures which can be completely examined is increased by a factor of 1.5 and the possible height difference between the smallest and the largest full bottle which can be safely inspected increases to 30 centimetres. Change of type and format at the push of a button. The high degree of automation and the intuitively comprehensible audio-visual HEUFT *NaVi* user guidance of the HEUFT *SPECTRUM*^{II} platform make the complete inspection of the closures simply easy to connect to full container inspectors and fill management systems such as the HEUFT *SPECTRUM*^{II} VX.

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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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Double fill level check

A new type of X-ray module provides the HEUFT full container inspection and fill management systems with an additional plus in functionality and detection reliability. Not only underfilled but also overfilled containers are now identified with one and the same measuring bridge. Variations in the thickness of the container material are compensated for so that an exact fill level check can be carried out even in difficult cases.

This works in one and the same operation with only one X-ray module which can be connected to the HEUFT *ONE*, the HEUFT *PRIME* and the HEUFT *SPECTRUM* ^{II} *VX* as standard with immediate effect. Where previously two measuring bridges were required in order to detect both underfilled and overfilled bottles and cans the newly developed one alone is now sufficient in virtually all applications: even with a distance of a good 20 millimetres between the lower and upper fill limits the area in between is completely covered during the fill level check.

Thanks to a recent enhancement of the self-programmed software and the extra-wide design of the multipixel X-ray receiver, the innovative measuring bridge realizes not only one, but up to eight parallel measurements of the X-ray absorption of each individual packaging material – distributed over the entire height of the filling area to be checked.

Variations in thickness and structures in the container glass, which absorb the X-rays so strongly in conventional one-dimensional measurement that the actual fill level of the contents could be overlooked, are compensated for in a targeted manner. In this way, checking the fill level delivers accurate results even in difficult cases.

This is possible with the innovative X-ray measuring bridge even in opaque packaging, metal containers and full containers with special contents such as high-proof alcohol – in other words, in special cases

where the use of the alternatively available high-frequency fill level measurement is not always possible.

The new detection module can be simply integrated into the HEUFT *ONE* and the HEUFT *PRIME* for checking full containers as well as into the HEUFT *SPECTRUM* ^{II} *VX* fill management system and reliably detects both under- and overfills of the nominal fill quantity in one and the same operation even in difficult cases.

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Shoulder view during empty can inspection

Ensuring that the can can be closed, preventing seaming blockages and the resulting loss of productivity, detecting and rejecting faulty and contaminated packaging in good time before filling: the HEUFT *canLine*^{II} carries out a precise quality inspection of up to 1,200 empty beverage cans per minute – and even finds faults in the inner shoulder area which is difficult to see with the help of smart new additional optics.

It can identify deformations, indentations and defects at the crimped rim of the mouth of empty cans just as reliably as dirty and dented inner walls or contaminants and foreign objects at their base. All this is carried out by the compact HEUFT *canLine*^{II} with only one HEUFT *reflexx*^{A.I.} camera in a top-down arrangement in which the smart image processing for the targeted object detection and classification is directly integrated. The colour sensor camera including completely integrated image converter technology and adaptive LED illumination achieves such a depth of field that no critical defect can be overlooked.

The compact system can now be extended by an additional detection unit in order to ensure that the empty can inspection also completely covers the sloping inner shoulder area just below the can opening which is difficult to see: Based on the HEUFT *FinalView*^{II} CAP technology for the 360° closure inspection this generates a total of eight high-resolution camera views from exactly the right perspective directly on the conveyor which show the sensitive area below the rim of each individual can all around.

Even the smallest damage, adhesions and contamination such as material defects, coating faults, oil or grease residues and stains are reliably identified there in conjunction with the HEUFT *reflexx*^{A.I.} image processing. And this also during the minimal distance between the individual containers on the conveyor.

The superordinate HEUFT *SPECTRUM II* platform on which the HEUFT *canLine II* is based realizes the highest degree of automation and support for the user: the height and LED illumination of the intelligent camera are adapted to the new container format just as automatically during a type change as the passage width of the guide rails in the inspection area. The HEUFT *NaVi* user guidance system provides the user with an audiovisual step-by-step assistance which makes every changeover self-explanatory.

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One lane to maximum output

In order to achieve resource-saving, fault-free high-speed filling even in beverage can lines with little space, H.F. Meyer Maschinenbau GmbH & Co. KG, Domino Deutschland GmbH and HEUFT SYSTEMTECHNIK GMBH have developed a joint complete solution in partnership.

Filling capacities of more than 100,000 units per hour are not uncommon in beverage can lines. With the right equipment for conveying, marking, and in-line quality assurance of the practical containers even before filling, even more is possible. However, during speeds of over 120,000 cans per hour, the performance limit is reached. At this point, at the latest, conventional solutions can no longer provide the filling machine with a continuous supply for full productivity in one lane, but only in two – with corresponding additional requirements for aggregates, components, space, energy and costs.

Beverage can fillers wishing to save space and conserve resources have thus to date had to make do with lower output. This situation has now been remedied by a newly developed compact all-in-one solution for which three skilled suppliers have pooled their competences to enable this target group to achieve significantly higher output in the same time.

Without the need for an additional supply line, the filler can be continuously and harmoniously supplied with fault-free, permanently marked empty cans even when the line speed exceeds 120,000 units to be filled per hour. The clever combination of vacuum transport systems from H.F. Meyer, laser coding from Domino and empty can inspection from HEUFT realizes this using only one infeed lane.

While the HEUFT *canLine*^{II} systems carry out the top-down inspection of each empty can in order to detect all faults which are critical for productivity and product quality from indentations in the flanged rim of the neck finish to damage as well as contamination in the sensitive

shoulder area directly underneath to dented or contaminated inner walls and foreign objects on the base, the HYVAC vacuum conveyor from H.F. Meyer transports them, safely sucked in, close together at high speed along the detection stations.

For reliable high-speed coding with the Domino F720i fiber laser, they are then transported over the HYTRANS vacuum bridge from H. F. Meyer in such a stable manner that best-before dates and other information can be applied pin-sharp and permanently to the outside of the can base. An intelligent color sensor camera from HEUFT reads them back and verifies the contents in the same process. The fact that the coding takes place before the filler instead of after the pasteurizer as is usually the case saves the time-consuming double turning of full cans.

The HEUFT *pusher* consistently rejects all empty cans identified as faulty so that only faultless ones reach the filling machine. They can be reliably filled and closed and are clearly marked so that they are transported there via only one lane. The fact that this now even works reliably during line performances of more than 120,000 beverage cans to be filled is the result of the successful cooperation between the three high-performance partners. The joint all-in-one solution will soon be available to anyone who wants to achieve reliable handling, clear marking, precise in-line quality assurance, and fault-free beverage can filling at top speed in a very confined space without incurring escalating costs. It will be on display at drinktec 2022 at the H.F. Meyer booth B4.223.

Press release

Dynamic labelling

As the first semi-modular labeller on a highly automated HEUFT *SPECTRUM II* basis the HEUFT *TORNADO II dynamic* simply achieves more performance, precision and dynamics during wet glue, self-adhesive or wrap-around labelling. The same applies for the integrated quality inspection in the same work process. Integrated voice control creates full responsiveness during machine analysis and process control for simply more efficiency and productivity across the board.

The first labelling machine based on the HEUFT *SPECTRUM II* achieves really appealing results simply due to the significant plus in automation, computing power and accuracy which the multi-processing capable device platform of the new generation has to offer during container tracking, label application, quality control and rejecting faulty products.

The use of up to four electrically coupled labelling stations provides additional dynamics and flexibility: three wet-glue stations for chest, back and neck labelling of up to 60,000 containers per hour are just as possible as a combination of wet-glue, self-adhesive or wrap-around labelling in one and the same machine. In the model exhibited at drinktec 2022, the first station is manned by securely housed, automatically height-adjustable high-performance cameras that use, for example, embossings or even the inconspicuous press seam in the glass as orientation points for servo-controlled fine alignment of the bottles to ensure that the labels are applied cleanly and wrinkle-free to the millimetre where they belong. Permanently mounted in the new-generation semi-modular, tableless labeller, all these units can be replaced with little effort during changeover.

Integrated detection modules for checking the presence and position of the freshly applied labels, as well as for checking the BBD, microcode fill level, and cap, among other things, carry out the quality inspection of the

freshly applied full product in the same operation. Faulty bottles are safely rejected.

The HEUFT *NaVi* user interface provides a complete overview which is not only displayed on the terminal of the compact machine but also on four flat screens positioned around its top. No matter where he is particularly located: The user always has the current status of the HEUFT *TORNADO II dynamic* in view as a result. The audiovisual user guidance with individual step-by-step assistance and above all the further optimized hands-off voice control provide additional added value:

In real dialogue with the virtual assistant Amanda, the new-generation labeller can be operated without manual intervention, using only the voice. Amanda listens to the user, answers questions and speaks to him as soon as something needs to be done. He hears in good time, for example, how many labels are still in the magazine or how long the respective program will run. Verbal instructions for actions such as grade changes or test bottle programs are implemented directly. In clear language, the unique hands-off voice control always keeps the user informed about the situation of the labeller and the entire process, and actively protects against performance losses, breakdowns, and downtimes. This sustainably increases the efficiency and productivity of entire filling lines.

Among other things, the easy-to-integrate automatic magazine loading system for increasing the label supply during wet-glue labeling also contributes to this. The solid, practically tableless design of the HEUFT *TORNADO II dynamic* realizes optimum accessibility for cleaning, maintenance, changeover and conversion.

Press release

Company profile: HEUFT is SYSTEMTECHNIK

Quality, safety, efficiency: this is what counts during the filling and packing of drinks, food and pharmaceuticals! Modular checking, inspection and labelling systems from HEUFT SYSTEMTECHNIK GMBH realize these key factors effectively and simply. During maximum productivity they ensure that only faultless products reach the market.

Unique camera, X-ray and image processing technologies for a precise empty and full container inspection, trend-setting labelling methods and smart tools for container flow optimization, production data acquisition and performance analysis ensure product quality and line efficiency in the long term!

A consistent modular principle with a cross-system control unit for a wide variety of technologies, processes, and modules generates the right automation solution for every application during high component uniformity.

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

This concept keeps the globally operating company on a dynamic growth course. In the meantime, the number of employees has long since exceeded the 1,000 mark. The company's own locations in 18 different countries and a close-knit network of service points on all continents satisfy the high demand for HEUFT systems which are exclusively manufactured in Germany.

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

heuft.com info@heuft.com marketing@heuft.com

Press release

Fact sheet

Company: HEUFT SYSTEMTECHNIK GMBH

Management: Alexandra Heuft, Bernhard Heuft, Bastian Heuft,
Dr. Thomas Jahnen, Thomas Holzberger

Headquarter: Burgbrohl, Rhineland-Palatinate, Germany

Other locations: Argentina, Australia, Brazil, China, Denmark, France,
Great Britain, Hong Kong, India, Italy, Mexico,
Netherlands, Austria, Russia, Spain, Thailand, USA

Foundation: 01.04.1979

Employees: 1,200 in the HEUFT Group, of which over 750 at the
Burgbrohl production location

Sector: special machine construction

Product range: inspection, quality control, labelling, rejection,
transport and IT systems for the beverage, food and
pharmaceutical industries

Applications: empty container inspection, bottle sorting, empty
bottle inspection, fill management, full container
inspection, full container inspection, foreign body
detection, rejecting faulty products, container
transport, conveyor control, labelling, label
inspection, code verification, production data
acquisition, line analysis, brand and recipe
management

Internet: heuft.com

Contact: info@heuft.com, marketing@heuft.com