

TECHNEWS

WINE SPECIAL



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The in-line inspection of wine bottles

SAFE WITH HEUFT!

The safety of the product and the perfect appearance of the packaging matter when filling fine wines. Positive purchasing decisions are only generated at the point of sale and costly, image-damaging recalls prevented by means of flawless products of top quality. HEUFT quality control and inspection systems ensure that wine bottles which do not fulfil these criteria do not reach the market in the first place.

Bottles which are dirty, contaminated or damaged, fill levels which deviate from the norm, corks which leak, screw caps which cannot be opened and labels which are crooked, creased, non-brand or incorrect as regards contents – a variety of defects threaten the safety and quality of wines and their packaging. Precisely working, high availability inspection systems are required in order to identify them whilst still in the filling plant and remove the products in question in good time – inspection systems from HEUFT!

Whether empty bottle inspection, fill level and closure detection or extensive label inspection: as the worldwide technology

leader with regard to in-line quality assurance for empty and full containers we also have suitable products in our range for the wine sector. Our modular system enables us to supply individually equipped inspection devices with exactly those detection technologies which you really require. They identify wine bottles with safety and quality defects with maximum precision and consistently reject them before they can reach the market.



HEUFT SPECTRUM TX

ONE STANDARD DEVICE WITH A WHOLE HOST OF POSSIBILITIES!

You know best which tasks have to be performed in your wine bottling plant. The modular construction of the HEUFT SPECTRUM TX series allows you to decide for yourself with which functions you wish to equip your systems for the in-line inspection of empty and full bottles.

A universal standard device forms the basis for tailor-made solutions which meet your specific requirements exactly. All the cross-system technologies are accommodated in this compact, network-compatible control unit. This includes among other things:

- the multilingual HEUFT PILOT graphical user interface with user-related and password-protected access rights
- the interface for an online connection to databases and MES systems for recording and archiving operating and production data
- the interface for remote service using

the HEUFT TeleService

- extensive product monitoring including reject verification
- integrated self test functions for regularly checking the detection reliability

With that the HEUFT SPECTRUM TX systems provide maximum versatility and operational reliability and at the same time fulfil fundamental archiving and documentation obligations.



HEUFT *InLine* empty bottle inspection

UNMATCHED VERSATILITY AND UNMATCHED PRECISION

Whether only a base and finish inspection or the complete inspection of the total container volume, whether a camera or an X-ray based detection procedure, whether a manual or an automatic brand change: HEUFT *InLine* empty bottle inspectors can be equipped so that they meet your specific requirements accurately due to their modular design. They remove wine bottles which are contaminated with foreign objects, dirty or damaged from the production flow before the filling process.

Those who wish to make sure that their wine bottles enter the filler without foreign objects, contaminants or defects in the base and finish area make the right decision with the cost-effective basic model of the HEUFT *InLine*. However the best option is to decide on the equipment variant of the inspection system which examines all the surfaces of



The basic model of the HEUFT *InLine* is extremely compact requiring less than one square metre of floor space.



The additionally integrable sidewall inspection carries out a continuous inspection of the empty bottles.

the empty bottle if quality defects in other areas of the container should also be detected. It also identifies contaminants, inclusions, chips and signs of wear on the base, body, collar and thread with a high degree of precision during an interaction of effective illumination, high-resolution camera and precise picture evaluation technologies. The HEUFT *InLine IS* provides even more detection reliability, user friendliness, availability and efficiency. Because its conveyor belts, which set the bottles rotating on their journey through the device, are driven by precisely functioning servomotors. The result: an optimum positioning and a fine alignment of the bottles at each individual detection station for a continuous inspection without "blind" areas. In addition the servo technology reduces the proportion of components prone to wear and makes fast and straightforward program changes possible due to clearly reproducible brand adjustments: the height and width of the guide

belts adapt themselves automatically to the changed bottle format at the touch of a button.

An innovative technology for inspecting the finish and the HEUFT *InLine* empty bottle inspectors equipped with X-ray modules, as an absolute world first, are available in order to reliably track down even the smallest faults which were not considered to be detectable until now.

Even thermal cracks and stress cracks which can cause the finish to burst during the corking process are detected using a multicoloured LED complete illumination of the area around the bottle opening and a sophisticated high-performance camera, filter and image analysis technology. The sealing surface is completely covered in the course of this. The adjustment of the bottles is also servo-controlled so that the inspection includes the inside of the finish as well.

The HEUFT *InLine IXS* identifies transparent splinters of glass which can hardly be seen



with the naked eye as well as shell-shaped fractures and chips on the container base. It is not only equipped with proven optic detection units and servo drives for a specific container rotation for this but also with the unique, particularly careful and precise, pulsed HEUFT X-ray technology (see the info box "X-ray flashes instead of X-ray beams"). High density foreign objects and damage with loss of material have a significant effect on the X-ray absorption and can then even be identified with certainty on the high-resolution pictures as a result if they are hidden behind the dome or covered by the base edge, knurling marks, embossing and other material structures. The HEUFT *InLine IX* which has additional X-ray strobes for inspecting the sidewalls and the area around the

bottle opening is the best choice for those who wish to find such faults in other parts of the container. It even detects the interrupted threads of screw top bottles reliably. Whether camera or X-ray images: all the detection pictures are transferred digitally for real time analysis to the in-house developed, high-performance image processing system which clearly differentiates between real and supposed quality defects (see the info box "HEUFT *reflexx*²"). This maximises the detection reliability, minimises the false rejection rate and increases the efficiency of the complete wine bottling line.

No matter which tasks and inspection aims have to be completed there: the empty bottle inspectors of the HEUFT *InLine* series can be equipped exactly in such a way that this

is always carried out accurately, efficiently and with unrivalled precision due to their modular design.

HEUFT *reflexx*²

The new dimension in detection reliability

An extremely powerful image processing system is required in order to obtain optimal inspection results even at high production outputs. Therefore we have developed our own which is specifically designed for HEUFT systems. HEUFT *reflexx*² is the name of the latest generation of this hardware and software for the real-time combination and analysis of a wide range of detection pictures. Integrated filter and evaluation masks clearly distinguish between cosmetic defects and real risks to the product quality. The HEUFT *reflexx*² reaches a new dimension in detection reliability with a false rejection rate which is in the tenth of a percentage range due to a faster image transmission and greatly increased computing power, resolution, colour depth and contrast. Furthermore the specific teaching in of good and faulty objects is considerably faster and easier without affecting the sensitivity. The function for automatically saving all the detection pictures is completely new. The power consumption of the high-performance image processing system has also been dramatically reduced.



X-ray flashes instead of X-ray beams



The unprecedented detection reliability of the HEUFT *InLine IX* empty bottle inspector is due to the in-house developed X-ray technology which has only been used in the full container inspectors of the HEUFT *eXaminer* series until now. In contrast to conventional X-ray scanners radiation is only emitted precisely at the moment when a bottle to be examined is in the inspection area and that in the form of an X-ray flash which only lasts a

thousandth of a second. This extremely short exposure time allows high resolution X-ray images rich in contrast without motion blurs to be produced even along high speed lines. Furthermore the individual bottle is therefore exposed to approximately 100 times less radiation on average than in the case of the classic line scanner. For example such an X-ray strobe only emits radiation for 36 seconds when screening 36,000 bottles in one hour. Therefore there is no emission whatsoever during 99% of this period. On the other hand conventional X-ray devices emit radiation continuously for 60 minutes. Another advantage of this pulsed radiometric measurement: the inspector neither has to be switched off nor run empty during line stoppages – there is no danger of the containers being subjected to excessive radiation.



HEUFT *FinalView FO* final product inspection

OUTSTANDING PRECISION DURING THE INSPECTION OF LABELS

The HEUFT *FinalView FO* fulfils the highest demands when it comes to the specific quality inspection of the most varied labels. It shows its true qualities especially on premium wine lines and in the case of a large variety of brands and specifications.



Are the labels present? Are they straight, without any offset and in the correct place on the wine bottle? Are they intact and without folds or dog ears? Is the label design really correct and in the correct language - does it correspond to the filled

product and the respective target market? Questions such as these play an important role especially for export-oriented wine producers with a wide range of brands and specifications. The superior inspection technology of the HEUFT *FinalView FO*

provides exact answers.

The system for a final product inspection carries out a homogenous, all-around illumination which is automatically reproducible according to the brand in order to check the presence, correct positioning and integrity of the labels and that their contents correspond to the filled product. For this LED modules of the latest generation, which are precisely controllable, move the wine bottles to be examined into the correct light. They are harmoniously illuminated from above and below. This is achieved without having to make any compromises because the conveyor chain lets light through: matt or shiny label areas are individually illuminated so that neither reflections nor shadows can impair the outstanding precision during the detection of faults.

Furthermore the fully developed optics contributes to the impressive detection accuracy of the new HEUFT *FinalView FO*:

up to four Gigabit Ethernet cameras on two levels produce pin sharp, high-resolution colour photographs from four staggered angles of vision which are combined into a 360 degree view without dead zones and artefacts afterwards. Therefore an unmatched exact inspection of minute details is achieved.

The colour photographs are digitised and transmitted per Gigabit Ethernet to the new HEUFT *reflexx²* high-performance image processing system (see the info box on page 5) for evaluation. Containers with missing, non-brand, incorrectly positioned, misprinted or damaged labels are identified precisely and the proportion of costly false rejections compared with conventional devices is drastically reduced. The new HEUFT *FinalView FO* also detects symbols or lettering the colour of which is similar to the respective background. The system even reliably differentiates labels which only deviate due to a single characteristic which is just five square millimetres in size. It removes incorrectly labelled wine bottles gently but consistently from the production flow. This ensures that only optimally equipped products reach the market. Whether a fill level, leakage and closure

logo check, serial fault detection, BBD and barcode verification or an automatic vertical and guide rail adjustment for fast brand changes: the range of functions of the modular system can be extended if required. It inspects up to 72,000 bottles per hour without difficulty and even has upward output reserves. Furthermore

the HEUFT *FinalView FO* carries out the inspection of oversized containers with a diameter of up to 150 millimetres.





HEUFT *basic* & HEUFT VX

A FILL LEVEL DETECTION IS GOOD BUT FILL MANAGEMENT IS BETTER

Is the fill level correct or is there too much or even too little wine in the bottle? The compact HEUFT *basic* full container check verifies this whilst still on the filling line. The HEUFT VX is the best choice for those who wish to monitor and document the function and performance of each individual filler valve as well as the overall production quality. Because it carries out an extensive fill management.

The producer risks a serious loss of image and even legal consequences if underfilled bottles reach the market. Overfilling is a cost factor which should not be underestimated in the long term: the valuable product is really partly given away. For this reason an in-line fill level detection is indispensable. HEUFT has two solutions for this in its range: the compact HEUFT *basic* full container check manufactured in series production and the modular, network compatible HEUFT VX fill management system. The HEUFT *basic* detects fill level deviations depending on the characteristics of the product and the packaging using different procedures: infrared photocells are used if the bottle and the product contained in it are transparent. High-frequency technology prevents foam which may be present from

affecting the result of the fill level detection. An X-ray measurement provides precise results for opaque bottles. The integrated serial fault detection with locator function allocates each checked drinks package to the respective filler valve. A stop signal is emitted if one of them is regularly the cause of faulty filling. A separate message on the operating panel of the cost-effective full container check provides information about the most frequent reasons for such recurring faults. The HEUFT VX carries out an even more extensive preventive fill management. Because the network-compatible system takes over the consistent monitoring of the filler and at the same time collects important information about the overall product quality in addition to a precise fill level detection.



For this it continuously supervises the performance of the individual filler valves and provides exact statistical data which can be transferred for archiving, documenting and line analysis via a protected online connection to PDA and MES systems. In this way malfunctions, which result in the repeated occurrence of faulty filling, are detected at an early stage. The HEUFT VX locates defective valves before they completely fail. Relevant warning messages avoid lengthy and costly production downtimes. Furthermore

an integrated quantifying module converts the results of the individual fill level measurements, carried out by means of infrared, high frequency, camera or X-ray technology, automatically into the actual fill value and calculates the average fill volume. This fill management which the HEUFT VX offers in addition to numerous other detection and quality assurance functions facilitates the documenting of elementary production data, prevents high false rejection rates as well as lengthy production line

downtimes and therefore provides effective protection against costly losses to the efficiency of the line.





NO DISPLEASURE WITH THE CLOSURE

Missing or incorrectly positioned corks, leaking or not properly functioning screw closures, absent or improperly flanged tamper evident rings, deformed or incomplete agrafes, damaged or non-brand caps: diverse closure faults threaten the safety and quality of wine and champagne bottles and their sensitive contents. It is good that HEUFT has an equally wide variety of innovative technologies in its range for precisely checking and inspecting the most varied closures.



The HEUFT *basic* can be equipped with infrared light scanners for the optical inspection of the presence of real cork, glass and synthetic corks. Photocells identify closure elements which are too high. The full container check verifies the presence of metal closures using induc-

tive sensors. Their curvature is also examined with this which makes it possible to draw conclusions about the internal pressure of the bottle being examined and consequently its tightness. The HEUFT *VX* provides even more reliability when detecting closure faults.

Other high-precision detection units can be integrated in the system from the HEUFT *SPECTRUM TX* modular concept (see "One standard device with a whole host of possibilities!" on page 3) in addition to those mentioned.

- canted closures are detected using ultrasonic sensors
- deviating closure colours as well as non-brand or faulty closure and cap logos are tracked down using a colour camera technology
- missing, damaged or detached tamper evident rings but also absent or crooked closures, faulty agrafes on champagne bottles and numerous other closure faults are detected by the HEUFT *VISION* module using a special illumination, camera and image processing technology
- defects such as crooked screw tops, faulty safety elements or wine corks which are either too high or too low

are also identified by the HEUFT *FinalView* closure inspection (also camera-based) which produces four views and puts them together into a centred detection picture which shows the whole closure area completely

The HEUFT *VX* has additional detection technologies available especially for checking the functionality, integrity and safety of newly applied long or Stelvin caps. The newly developed roll-on inspection obtains particularly precise results. Because it generates four different camera views of the contour of such screw closures and can precisely measure up to eight profile depths in each case. Missing thread turns or those which have not been formed enough can be identified with it just as well as those which are incorrectly positioned. Even nicks in the thread area as well as improperly flanged tamper evident rings are

reliably detected. The innovative inspection technology minimises the risk of wine bottles with screw tops which cannot be opened or are difficult to open, leak or even present a danger of injury to the consumer from reaching the market. It is just as important to promptly identify the causes of such quality defects as it is to reliably detect closure faults and to consistently reject the wine and champagne bottles in question. Therefore the HEUFT *VX* also offers an extensive closer management. It permanently supervises the correct operation of the closer analogous to monitoring the filler (see "A fill level detection is good but fill management is better" on pages 8-9) and exposes those closer heads which impair it. This information can also be transferred to PDA and MES systems for archiving, documenting and analysing purposes. Relevant warning messages make it possible to intervene in good time in order to avoid serial faults and to ensure the

productivity and efficiency of complete filling lines. Whether corks, stoppers, long or Stelvin caps: innovative quality control and inspection technologies from HEUFT ensure that only perfectly sealed wine and champagne bottles reach the customer.





HEUFT VGX – full case inspection

INSPECTING INSTEAD OF WEIGHING!

The HEUFT VGX not only checks the completeness and integrity of the contents but also numerous other quality features of the outer packaging for wine bottles.

Many wine bottlers use weighing systems as a final check for newly filled cardboard boxes, cases or trays. However broken containers inside the outer packaging can often not be detected with this: for instance if wine escapes from a burst bottle the total weight of the full case does not necessarily change straight away – the liquid stays

inside to begin with or gradually soaks into the cardboard. Those who have an inspection system which identifies the broken bottle even in the sealed outer packaging, the inside of which cannot be seen, as well as numerous other quality defects which scales cannot find are clearly at an advantage. The HEUFT VGX is therefore the clever alter-

native particularly in the premium segment! The end of line system reliably checks the completeness of the bottles in the case and also identifies faulty, underfilled, unsealed, lying and upright containers. In addition it examines the external appearance without contact and detects deformations and raised cardboard box flaps as well as faulty



The HEUFT VGX only allows perfect wine boxes to pass through.



Faulty wine boxes are rejected.



colours, logos and product markings. Cases with full containers which do not comply with the quality specifications are automatically sorted out. The HEUFT VGX also records serial faults in time and then issues a switch-off pulse immediately. The system uses three different technologies, depending on the characteristics and the material, in order to check the contents of the cardboard boxes and trays: infrared sensors emit light beams from above and if these are all reflected this means that the number of bottles in the case is correct. Inductive proximity switches identify metal closures. The corresponding wine bottle is either unsealed or not present if one is not found in the designated position. The greatest detection reliability is achieved

using X-ray technology: missing containers stand out immediately because the absorption rate of the radiation which is emitted in extremely low doses changes as a result. Bottles which are lying, broken, significantly underfilled or possibly leaking are also detected reliably in this way. Furthermore the HEUFT VGX also checks the external appearance of the outer packaging. Its height profile is measured, for example, by means of ultrasonic sensors in order to detect faults such as raised cardboard box flaps. The modular full case inspector can also be equipped with a colour, logo and barcode detection for winemakers with a large variety of products and packaging as well as for bottlers of select premium products who attach great importance to

their goods having a perfect appearance at the point of sale: a special camera system detects deviating case colours. Three different measuring windows can be defined so that differently coloured labels, lettering and symbols cannot distort the result in the course of this. In addition the HEUFT VGX can photograph up to seven different logos and compare them to the original designs previously stored in the system. A special sensor reads barcode labels. The end of line system accomplishes considerably more than conventional weighing systems due to this extensive inspection of the quality features of newly packed cardboard boxes and trays.



HEUFT SYSTEMTECHNIK GMBH

HEUFT IS SYSTEMTECHNIK!

HEUFT SYSTEMTECHNIK GMBH is the technology leader with regard to in-line quality assurance during the filling and packaging of food, drink and healthcare products. Pioneering in-house develop-

ments and a consistent modular system for a wide range of technologies, modules and tasks generate superior inspection systems which also meet special requirements exactly and achieve a new level of quality in terms of precision, efficiency and availability when detecting product

and packaging faults. Whether checking fill levels and closures, detecting foreign objects or inspecting labels: HEUFT creates solutions with a system because "HEUFT ist Systemtechnik"!



Customer Care & Technical Service

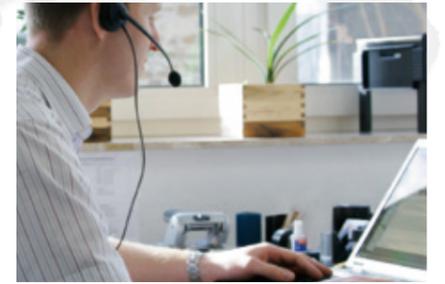
HEUFT WILL NOT ABANDON YOU!

A supplier who is extremely well positioned globally with fast reaction times is needed in order to avoid costly standstills and production downtimes: a supplier like HEUFT.

We ensure that our experienced service team is on the spot as quickly as possible for installation, commissioning, maintenance and repairs with our own locations in 14 different countries and a comprehensive network of service bases on five continents. The HEUFT TeleService provides an addi-

tional advantage: with this device malfunctions can be identified, analysed and in many cases directly rectified using a protected Internet connection from a distance independent of the location. An on-site visit, if this is nevertheless necessary, is shortened considerably due to the information received in advance.

Regardless of what happens: the HEUFT service team will not abandon you and will promptly rectify causes of disturbances before lengthy standstills and production downtimes can occur.



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