KTsoftware

EEP Maschinenbau & Elastomerrecycling GmbH

TÜVRheinland ZERTIFIZIERT

KT Vision Systems

www.eep-maschinenbau.de

KT Software - KTvision

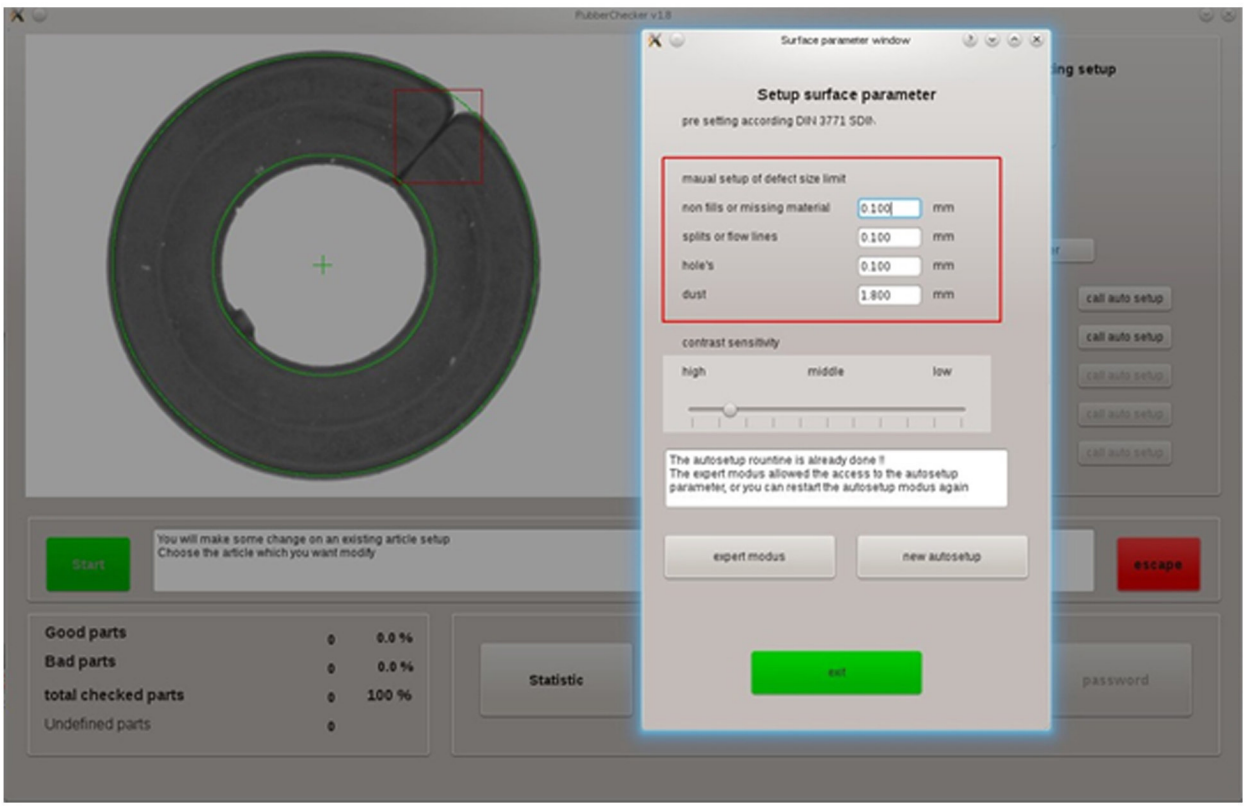
The KT Software is especially designed for rubber seals, but also useable for other materials. Rubber is called a living material and the surface condition of rubber seals has a wide varity of different looking. Therefore the rubber surface examination needs a special algorithm.

The KT software consists of all necessary tools for a vision inspection machine.
Features are:

- modern designed GUI
- a special feature is the active user guidedance
- facilitation for the user: auto-setup modus for usual seals like o, v, or q-ring, break seals, frame seals and so on
- expert setup modus for complex seals and for general optimization after auto-setup
- pattern recognition: the software recognizes the general type of defect
- all size limits displayed and prompt in mm or inch
- informative statistic
- machine operation (PLC)

KTvision - auto-setup:

The KT auto-setup is a useful tool for a fast machine setup. The operator can choose between the general type of seal in a list. Afterwards the operator can move a good sample under each camera and initialize the auto-setup.



The auto-setup adjusts the right light combination and the right camera parameter, as well as setting the area of interest. After a successful auto-setup, the machine can be used without any more adjustments. Only defect tolerance and basic sensitive settings are necessary to set.

This feature is even more useful for customers changing the parts in a high frequency.

KTvision - pattern recognition

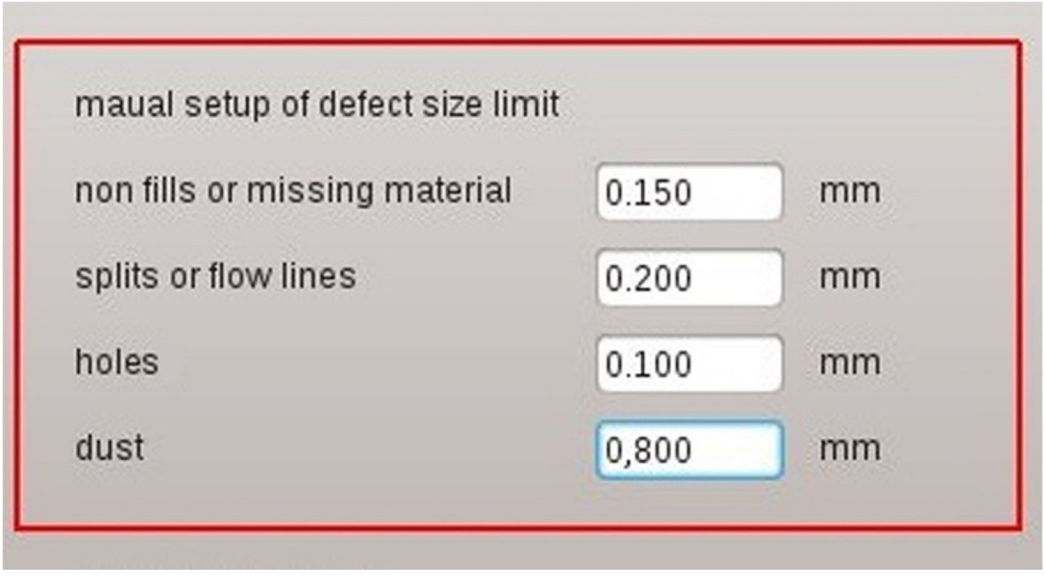
One of the most advanced feature is the pattern recognition. The software is not only checking the amount of white or dark pixel, it's able to recognize the major pattern of a defect. The customer can name the different pattern like: non fill, split, flow line, dust or whatever.

<u>The huge advantage of a pattern recognition is:</u>

- a strong reducing of called false scrap, while the software can recognize dust and contamination. Usually this leads to a decision as a bad part, but the KTvision can understand that dust, within a maximum size, can be accepted.

- The second advantage is a better statistic information, while bad parts are separated and counted in different kind of defects.

- The next useful advantage is the feasibility of setting different defect limits for different types of defects.



Example for different defect limits

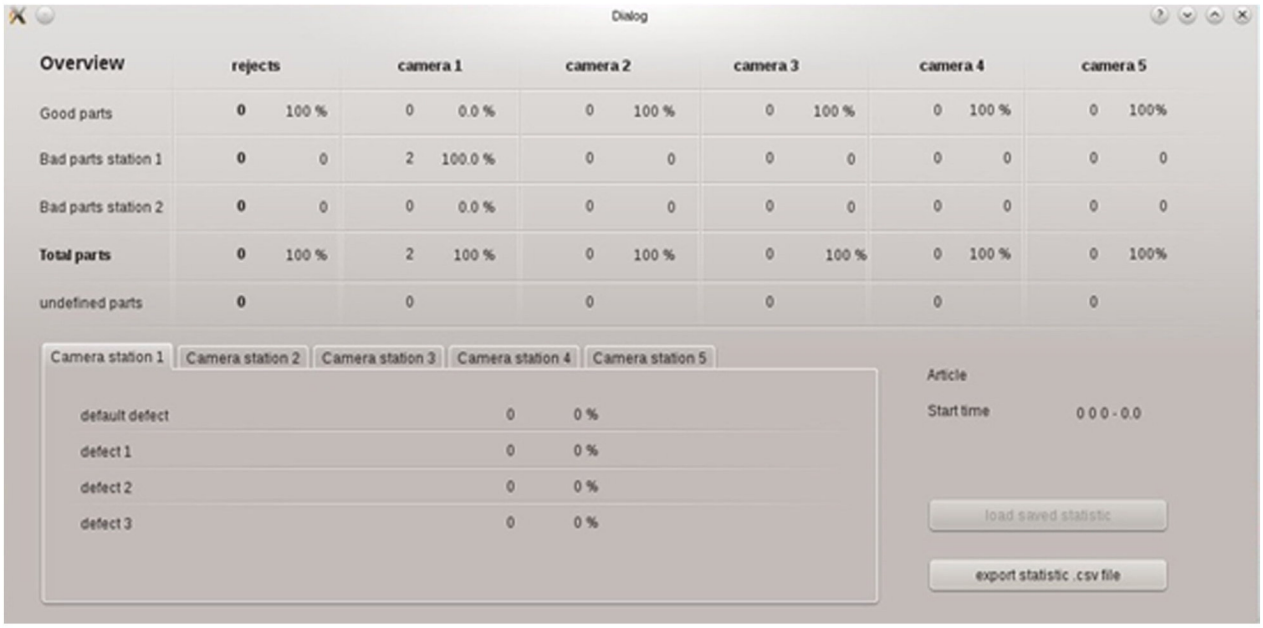
- a further advantage with an intigrated pattern recognition is: different limit values could be set for different defect types, in real measure, in mm or inch. Is the extension of a defect type higher than the set defect threshold the part is detected as faulty and sort out.

Using the maximum limit dimension for a type of a defect in mm or inch is more convenience for the operator as any setup in pixel amount.

KTvision - Statistic

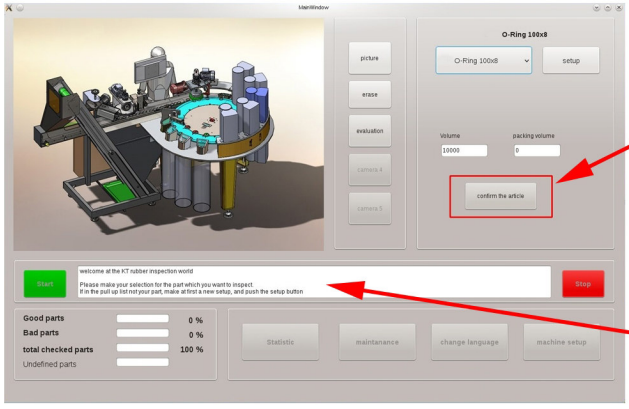
The statistic provides several useful information from the last inspection run. It's counting the good, bad and undefined parts as well as the different defect pattern.

The statistic can be export as an csv file (excel form), by an external network connection or downloaded to a memory stick.



KTvision – active operator guidance

KT understands under "active operator guidance" a useful tool to support the operator. There are two main graphic and text features: The software will flash in a red frame, covering the next likely operation. This will guide the eyes from the operator, together with a help text output in a separate text field, to the next right, or necessary operation.



A red frame flashing to show the next probable operator input

A short discription for necessary operator input or status report as quick help for operator is shown in the text field

Sorting

The parts are sorted depending on check result. Therby the items are blown off from the glass turntable and are collected in transparent and easy to handle boxes. The filling capacity is visible any time without need to remove the boxes.

To select the good parts in the right box all active sensors have to confirm with status „good“. This security measure avoids that a part is marked good although possibly a sensor has not inspected completely.

Bad parts could be seperated in two different boxes. If required, different defect types could be sorted out seperately or one box only includes bad parts to be reworked (e.g. flash) and the second box the really bad parts.

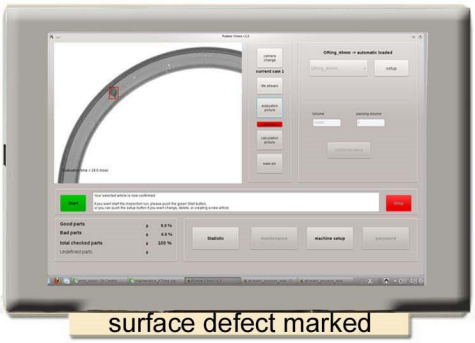
Parts with a wrong/not provable position, parts not marked with status „good“ by all sensors or parts with a fault unclear are fed back again to the inspection cycle.

Highlights at a glance:

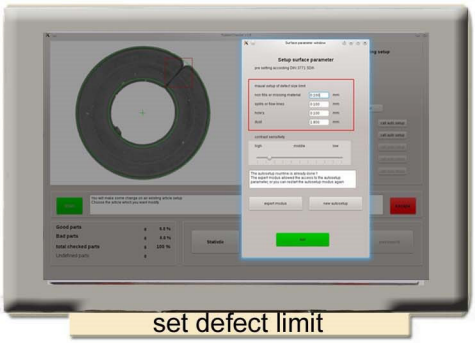
- Newest innovative algorithms for stable inspection results
- Minimization of pseudo false output rate by pattern identification
- Informative statistics of various defect types (MS-Excel compatible file)
- Comfortable touchscreen operation with clearly arranged and self-explanatory user interface (GUI)
- USB Port and network-compatible
- Active operator support with visual guidance
  >> next-step-help, where the software expects the next input/setting (red frame > next step) and additional short-help-text during the operator usage
- Innovative auto-setup function for fast read-in of articles during frequent product changes (>article library)
  >> Preset selection of the basic shape of the parts, then scanning good part once with each sensor - ready

picture gallary Ktsoftware

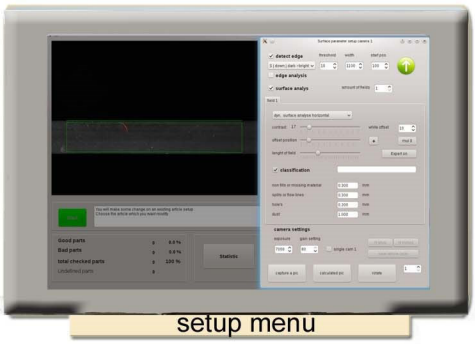
main operating page



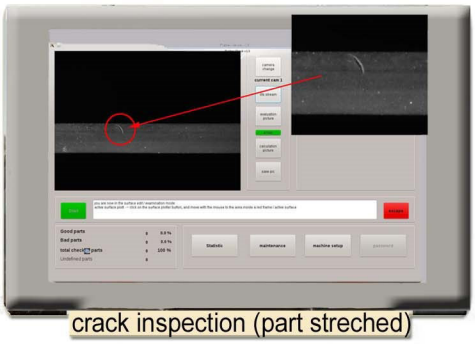
surface defect marked



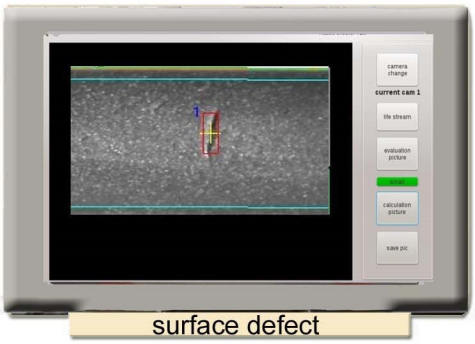
set defect limit



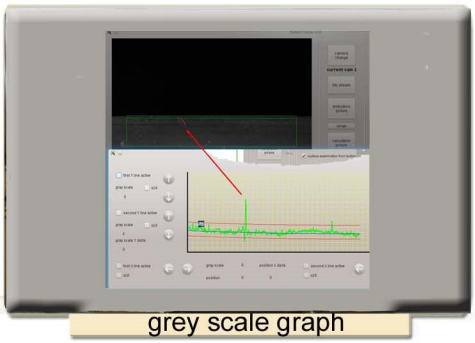
setup menu



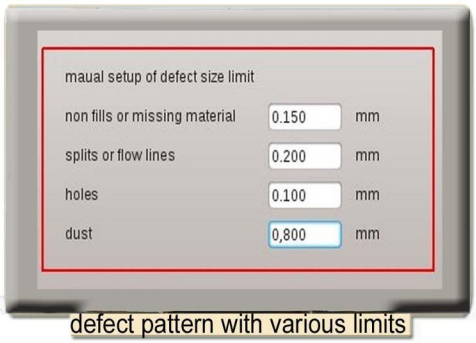
crack inspection (part streched)



surface defect



grey scale graph



defect pattern with various limits

statistics

software tools

setup image processing

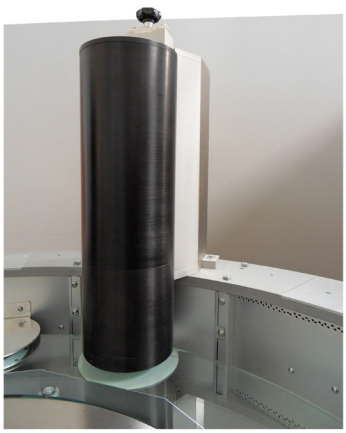
main page indexer inspection system

short info KTvision systems

KT Vision Systems aim to be as simple as possible needed with a modular design. This allows the user to concentrate on the product quality and to inspect small lots without efforts as well.

KT Vision Systems are unique in the picture analysis through consequent use of innovative sensor technologies. Combined with the very special software, this delivers highest quality and efficiency in the vision inspection.

KT Software, intelligent and easy to use! With KT auto-setup, the vision system applies a self-test on the master samples or even the first teach in parts. Generally, the operator sets only the severity and the minimum error limit. Lighting, flash, the test zones and the remaining parameters for the surface analysis are automatically determined and set optimally. The KT auto-setup works for standardized components and defects. For non-standard parts / seals, the expert mode is suitable to create your own receipts.

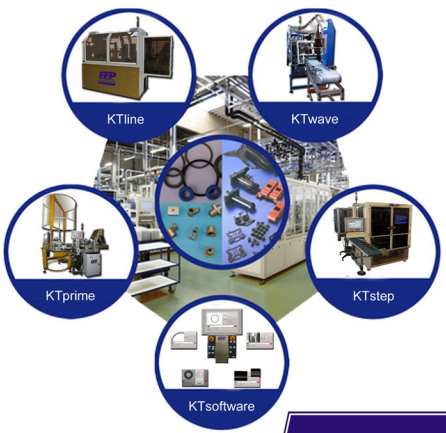


KT Sensors, the eyes of the inspection machine

Innovations in detail and highest optical precision generate detailed pictures of the parts. Multi-level lighting systems offer the highest possible contrast and thus a safe and reproducible surface analysis. All sensors are equipped with their own computing power and work autonomously. Only the instructions exchange via a network to the control computer. The pattern recognition collaborates together with an expert system generating the final decision if the detect area does not represent a defect or if the part has to be blown out as scrap. This very intelligent decision procedure reduces significantly the so-called pseudo scrap and makes the test system more efficient than most other systems on the market.

KT optimized mechanics

A stable engineering for optimized flow of parts form the backbone for sensor and actuator systems. Easy access allows rapid conversion to other parts and quick cleaning. The modular design allows for easy configuration and upgrades.



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