

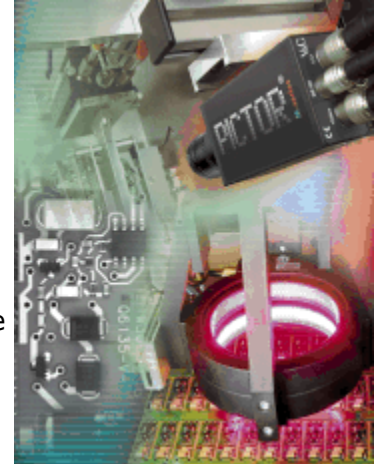
### Applications Examples

Systems offered by FS Systems and components supplied by Vision Control can be found in virtually all areas of the processing and production industries, all over the world.

Our most important aim is insuring that product quality is improved and is maintained at a high standard via 100% inspection, that processes operate reliably and that the level of automation is raised.

Some application examples (below) display the breadth of industries and tasks where FS Systems and Vision Control components are in use

- Precise measurements
- Robotics
- Short cycle times
- Rough environmental conditions
- Difficult lighting
- Multiple products / Small batches



The types of problems that can be successfully solved by use of FS Systems supplied components and systems are extremely varied and the possibilities for employing them are practically limitless. Typical sorts of problems involved are:

#### Measurements:

- length
- width
- height
- angle
- orientation
- size
- area
- center of gravity
- straightness
- roundness
- shape
- contour
- colour
- brightness

#### Testing:

- attributes
- distances, positions
- completeness-/presence
- colour- and pattern recognition
- degree of a feature
- read / recognize signs and characters
- code reading
- object recognition / identification
- material flow control
- proof of process capability (ISO 9000 cont.)
- process control: optimization of yield
- surface inspection
- print check control
- check of assembly
- recognize structures and textures
- recognition of position and rotation (robot vision)

# Applications where short cycle times are needed

## Complete measurement of vehicle headlamp bulbs /control of adjustment equipment



### The task:

Hundreds of thousands of motor vehicle halogen head-lamp bulbs are produced every day. These bulbs need to be manufactured to a very high precision. Every one of 28 separate geometric 3D data values from the bulbs as well as a final measurement must be determined during two adjustment cycles and at a cycle time of just 0.8s. At the end of the cycle the bulb is spot welded to the lamp base. The processing of the bulbs on a rotary table and the subsequent rotation of the Machine Vision necessary requires in addition that all the calculations undergo a coordinate transformation. The complete measured values are statistically evaluated.

### The benefits:

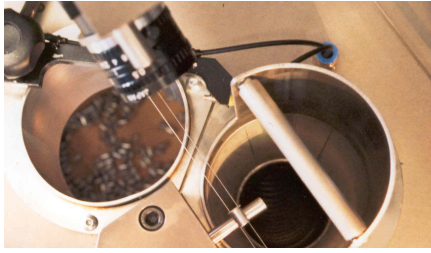
- 100% inspection at a speed where it is not possible to do manually
- process optimisation with down to zero error production
- production optimization via bulb classification (original quality, middle quality, cheap replacement parts)



### Components used:

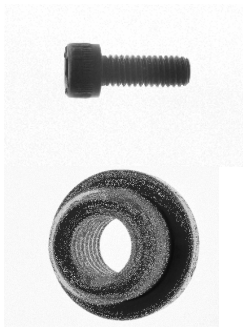
- Multi-camera system VME-bus-bases
- telecentric VICOTAR<sup>®</sup>-lenses
- diffuse VICOLUX<sup>®</sup>-lighting

## Measurement and finish checking of small manufactured parts



### The task:

To 100% check small manufactured parts for manufacturing tolerances and defects at high speed and accuracy. Parts include; Fasteners, glass vials, spark plug electrodes, rivets, injectors, washers, inserts and may more  
Cope with small batch runs and multiple different product types on one system  
Fail-safe pass/fail mechanism



### The benefits:

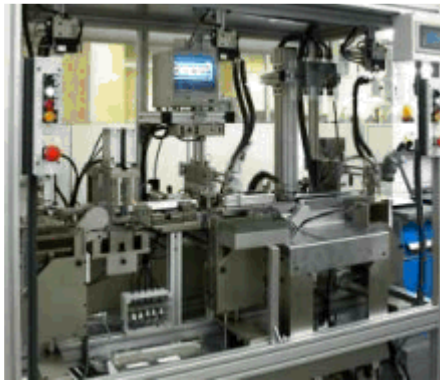
- 100% inspection at a speed where it is not possible to do manually
- Fast product changeovers and simple, graphical part selection with GenVis
- Flexible feed arrangement to cope with a range of component sizes
- Ability to statistically analyse failure results
- Boxing and feed control via GenVis
- Optional 2<sup>nd</sup> inspection point



### Components used:

- Multi-camera CheckFast system
- entocentric lenses VCH series
- LED lighting
- Industrial PC with touch screen
- Optional boxing conveyor for good parts
- Lockable reject area
- Vibratory feed system

## Assembly inspection of SMD diode encapsulation



### The task:

Bonded SMD diodes on lead frames are encapsulated at the end of processing. Here, the epoxy resin compound is poured into the mould and must fill it completely. Before cutting out, one carrier strip contains 72 diodes. The inspection time for 24 diodes is 250 ms. Defective diodes are marked with an index and their positions are passed on to the cutting tool that follows via PLC in order to be accurately cut out. They are sorted good / bad at another station. Three smart cameras in parallel are used for this.

### The benefits:

- replacement of several inadequate human inspectors who can become quickly fatigued
- reliable extraction of defective diodes
- higher output through quicker cycle time.



### Components used:

- 3 Smart Cameras PICTOR®
- diffuse VICOLUX®-lighting
- entocentric lens of the VCN-series

## Completeness inspection of confectionary



### The task:

Chupa-Chups lollies are provided with a transparent hollow stick that is filled with mint sweets. The stick is inspected for cracks, for whether it contains enough sweets and for if it is correctly assembled. The cycle time is 650 ms.

### The benefits:

- achievement of a more consistent product quality
- higher throughput compared to manual inspection
- hygienic requirements are fulfilled that were not possible with manual inspection



### Components used:

- Smart Cameras PICTOR®
- diffuse VICOLUX®-lighting
- entocentric lens of the VCN-series