

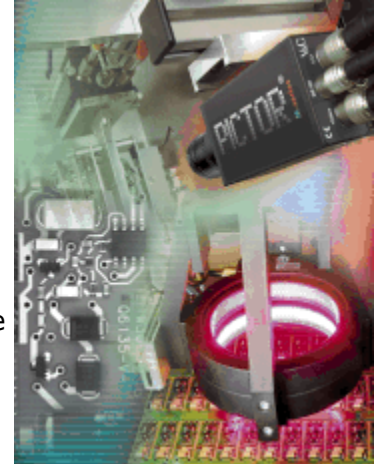
### Applications Examples

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:

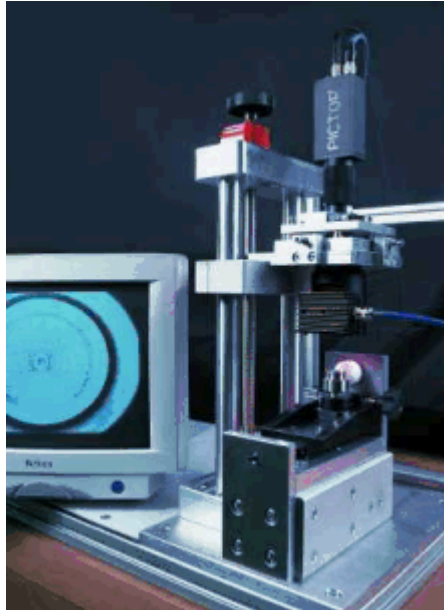
- length
- width
- height
- angle
- orientation
- size
- area
- center of gravity
- straightness
- roundness
- shape
- contour
- colour
- brightness

#### 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 precision is needed

## Concentricity inspection of turned and milled parts



### The task:

Manual work station for measuring the concentricity of two diameters in a turned part. The diameters were manufactured in two different settings. The part is manually fed.

### The benefits:

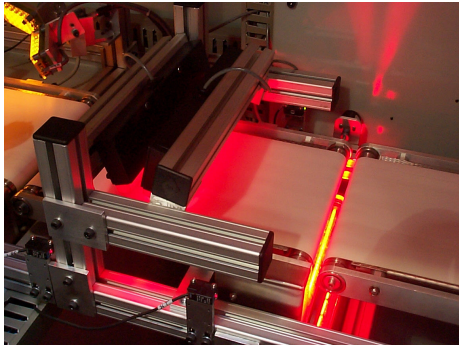
- simple layout (top view), so that the part does not need to be rotated
- simple determination of product quality, that takes longer with calliper based procedures and is considerably more expensive



### Components used:

- Smart Camera PICTOR®
- telecentric lens VICOTAR® T150
- directed VICOLUX®-lighting of the AL3328- series
- beam splitter unit of the ABE-series

## Dimensional checking of injection molded parts

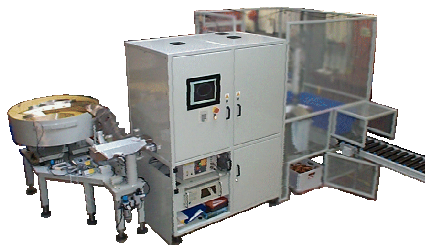


### The task:

Measure critical dimensions of circular plastic parts  
Also check surface finish for manufacturing faults  
Feed directly from molding machine, through the inspection  
and packed into boxes without human intervention  
Must run at production speed.

### The benefits:

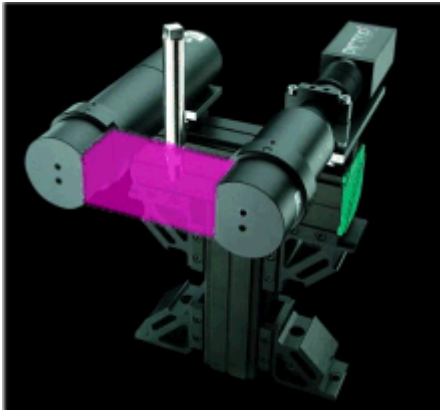
- Every part 100% inspected to ensure quality
- Measurements can be averaged for consistency
- Full statistical logging for SPC analysis
- Warn production team of recurring faults
- Easy part selection for colour variants



### Components used:

- 2 line scan Cameras and 4 area scan cameras
- GenVis image processing software
- Various entocentric lenses
- Diffuse LED lighting, and direct line lights
- PLC for system control
- PC with touch screen and machine control buttons
- Vibratory in feed
- Toshiba SCARA robot to pack parts into boxes

## Measurement of turned and milled parts



### The task:

High precision measurement of turned parts with difficult to handle shiny surfaces. Accuracy and speed are essential as bulk quantities are involved. The layout must as compact to allow the Machine Vision to be integrated into the existing equipment.

### The benefits:

- space-saving layout allows retrofitting to existing machinery
- difficult to measure parts can be rapidly measured during production
- no costly and complicated handling such as with calliper based procedures is necessary



### Components used:

- Smart Cameras PICTOR®
- telecentric lens VICOTAR® T150
- telecentric VICOLUX®-lighting of the TZB-series
- beam deflectors of the PSO- / PSB-series
- mounting plate and lens-holder of the OH-series

## Inspection of inner contours



### The task:

The measurement of the inner contours of cylindrical parts. The inner contour is geometrically structured and, due to the spatial depth, is inaccessible by any other inspection procedure. The cycle time is very short as mass produced parts are involved.

### The benefits:

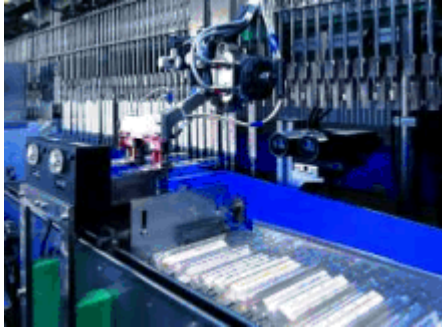
- the first time it has been possible to measure inner contours during production
- the use of Machine Vision can be used to set up process control to lead to continuous product improvement
- return demands from customers are minimized



### Components used:

- Smart Cameras PICTOR®
- telecentric lens VICOTAR® T150
- diffuse VICOLUX®-ring light of the RK3950 series

## Calibration of thermometers



### The task:

The precision of calibration of liquid thermo-meters must be certified. Determination of the height of the capillary at two different temperatures, finding the difference between the heights of the liquid and the classification and choice of the appropriate scale to be used are carried out by the Machine Vision system.

### The benefits:

- fully automatic solution of the thermometer calibration
- multiplication of the parts throughput
- calibration errors no longer occur



### Components used:

- Smart Cameras PICTOR®
- entocentric lens of the VCL-series
- diffuse VICOLUX®-lighting of the DL4646-series

## 3D measurement of glass bulbs



### The task:

In the manufacture of light bulbs, the glass bulb is drawn from glass tubing. The bulbs must be produced to a set shape and dimensions. Due to cramped conditions, the machine only allows the use of one camera, but requires 3D data from two viewpoints. This is achieved by the use of special lighting.

### The benefits:

- process control: the current data influences the upstream production
- minimisation of rejects- bad parts can be ejected before further production steps



### Components used:

- Smart Camera PICTOR®
- telecentric lens VICOTAR® T100-series
- application specific lighting