SmartRay

# DO MORE WITH SMARTRAY 3D

## 3D IS NOW BEING USED MORE AND MORE BY MANUFACTURERS FOR:

| AUTOMOTIVE
| ELECTRONICS
| INDUSTRIAL
| CONSUMER PRODUCTS

**3RD** | 50 examples of 3D Sensor applications

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# DO YOU KNOW WHAT 3D SENSORS CAN DO FOR YOU?

## FIND OUT HOW THESE COMPANIES ARE IMPROVING

## PRODUCT QUALITY AND REDUCING MANUFACTURING COSTS.

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# AUTOMOTIVE | APPLICATIONS

**The Automotive Industry was one of the first to enjoy the benefits of using 3D for inspection, guidance and measurement.** SmartRay 3D Sensors are now being used to ensure that components, sub-assemblies and complete vehicles meet the industry's stringent quality and reliability requirements. The following examples give just a small insight into the wide range of applications where 3D Sensors are being used and where they are providing major advantages over traditional 2D based vision systems.

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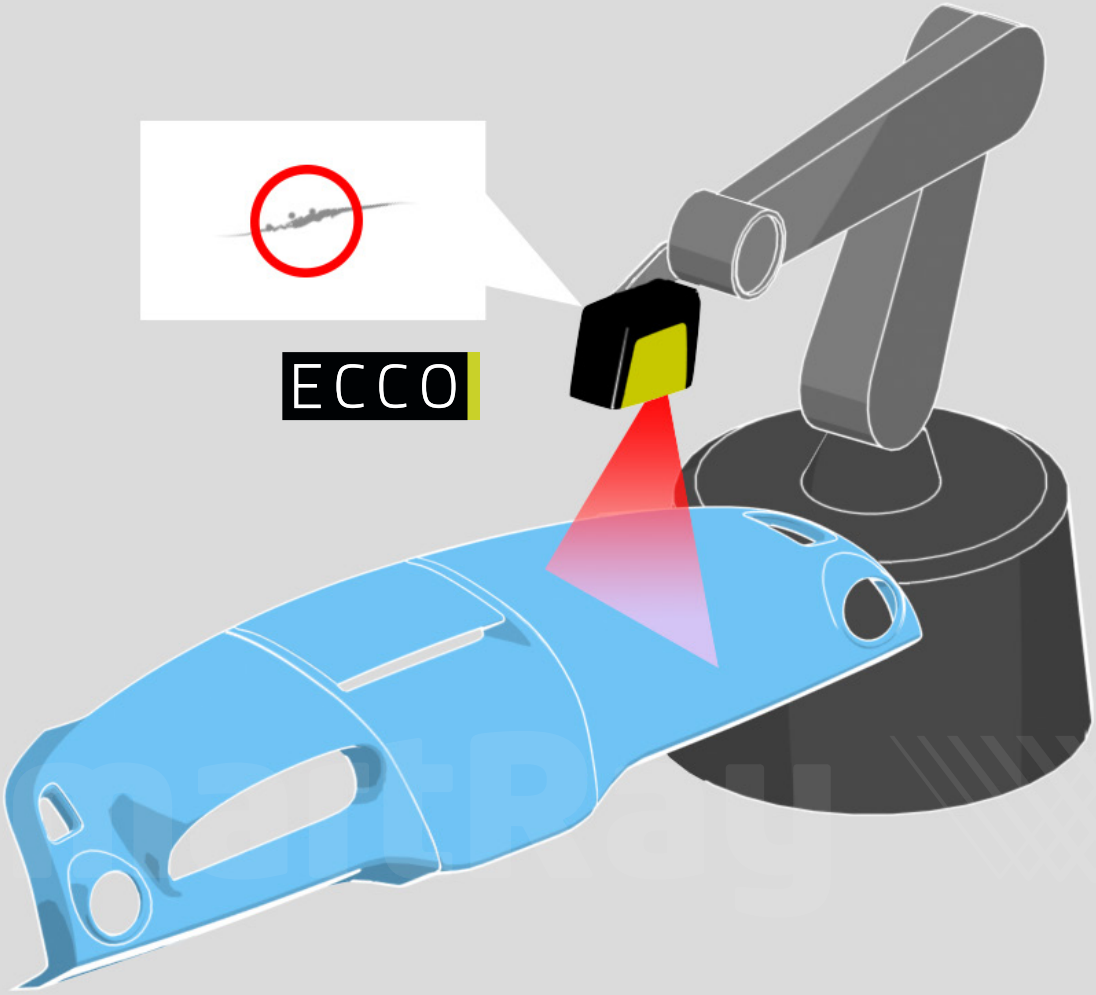
# AUTOMOTIVE | INSPECTION




## INTERIOR TRIM – SCRATCH DETECTION

Scratches on the interior trim of new cars are equally unacceptable to both consumers and vehicle manufacturers. SmartRay 3D identifies and quantifies scratches and other surface damage on both plastic and metal interior trim components.

### Why SmartRay 3D?

- Checks length, width and volume of scratches
- Inspects complex shaped surfaces for defects
- Good images irrespective of surface colour and finish

### 3D Solution Benefits

- Quantative evaluation and results archiving
- Improved product quality
- Replaces subjective manual inspection

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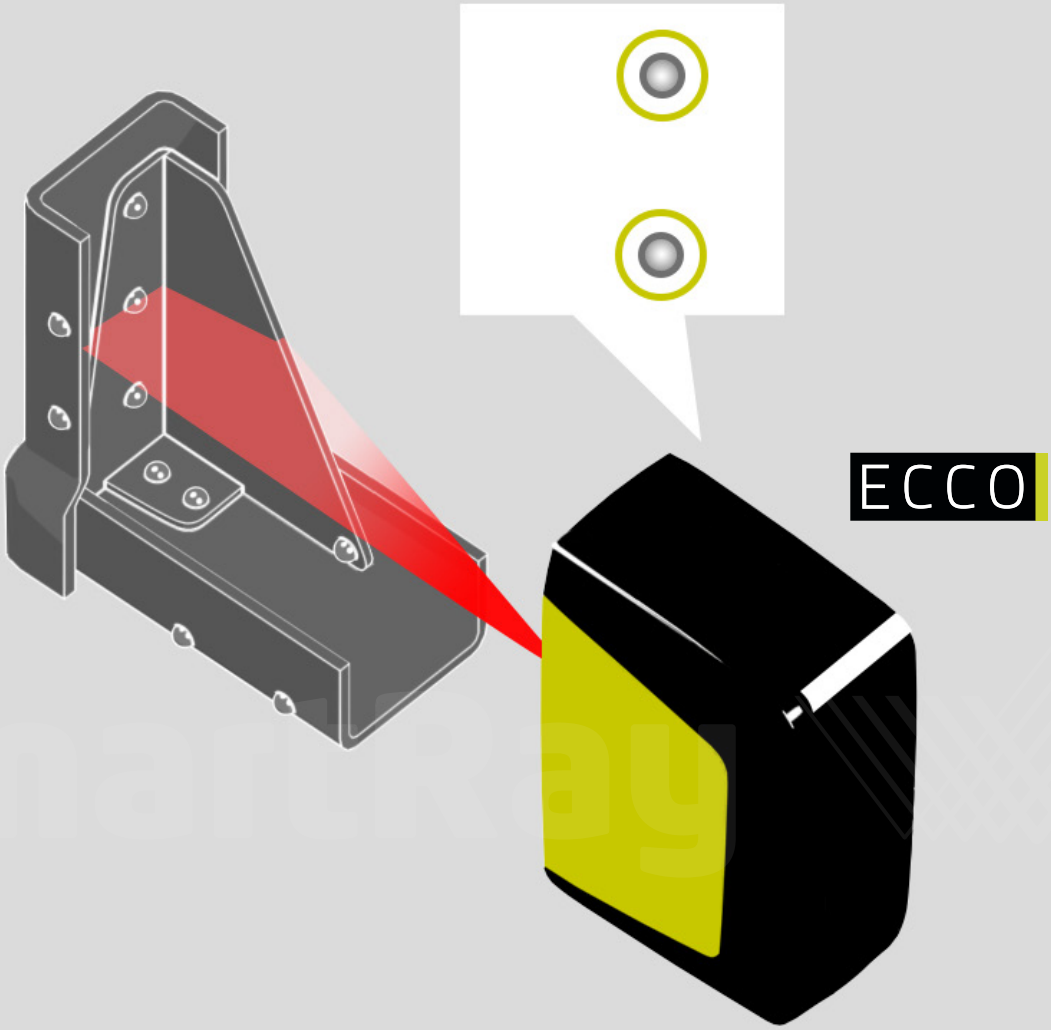
# AUTOMOTIVE | INSPECTION




## TRUCK FRAME – RIVET INSERTION

Joining sheet metal parts together with rivets forms a very strong assembly, but only if the rivets are correctly inserted and well formed. SmartRay 3D inspects the shape, height and profile of the rivet heads in a single inspection operation.

### Why SmartRay 3D?

- Inspects both presence and quality of riveting
- Light weight, compact 3D sensor
- Pre calibration required

### 3D Solution Benefits

- Improved product reliability
- Rapid system deployment
- Highly cost effective solution

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# AUTOMOTIVE | INSPECTION


## TIRE – TEXT READING

Reading raised black letters and numbers on a black rubber surface is highly challenging, but essential to manage the tire manufacturing and distribution process. SmartRay 3D solves an application that is virtually impossible to solve with 2D vision systems.

### Why SmartRay 3D?

- Clear image from low contrast black surface
- Clearly isolates each embossed character
- Image can be created by rotating tyre

### 3D Solution Benefits

- High character read rate
- Reliable tyre identification
- Eliminate unreliable manual process

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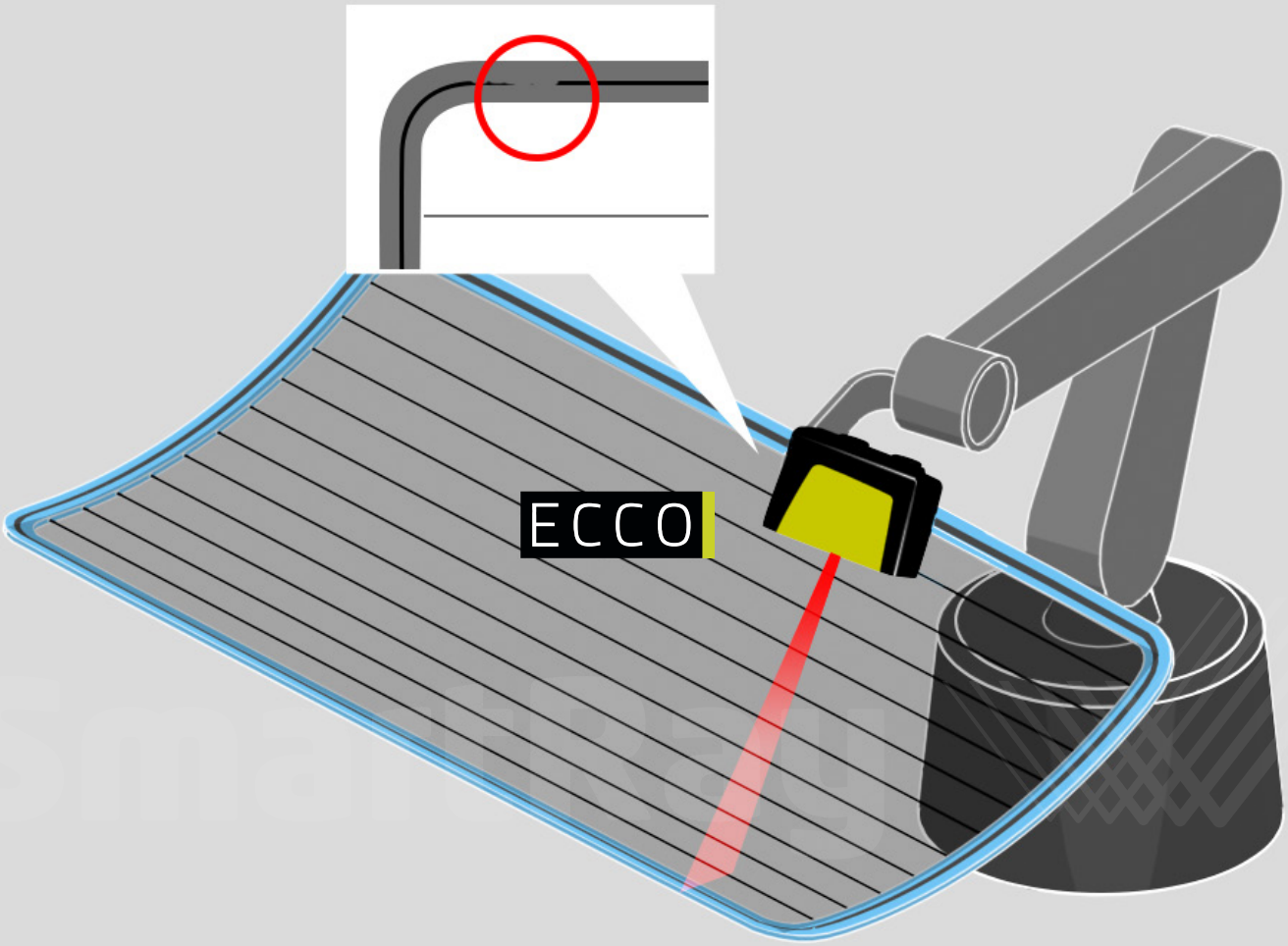
# AUTOMOTIVE | INSPECTION




## WINDOW – GLUE BEAD PROFILE

If the sealant glue bead that is applied to fixed windows is not of a consistent and accurate size, the vehicle integrity will be compromised and it will fail quality control. SmartRay 3D ensures high quality by inspecting the shape and profile of the bead prior to assembly.

### Why SmartRay 3D?

- 100% inspection of entire glue bead
- Inspects characteristics like profile and volume of glue and defects
- Combines high speed with high accuracy

### 3D Solution Benefits

- Complete control of the manufacturing process
- Indicates when reworking required before assembly
- Improved product integrity

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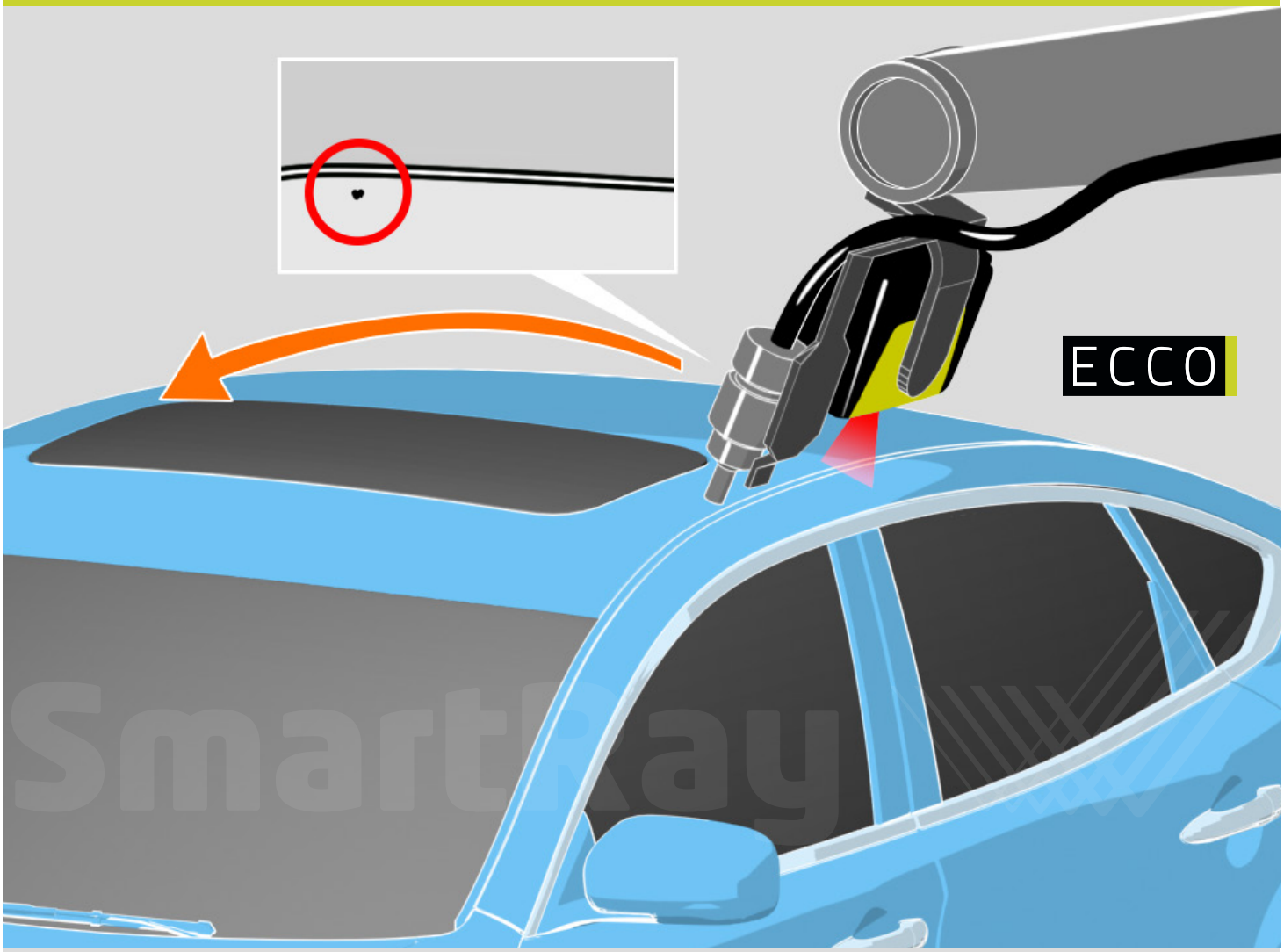
# AUTOMOTIVE | INSPECTION




## BODY SHELL – WELD INSPECTION

Indentifying micro-pores on welded areas of car body shells is critical to avoid lifecycle corrosion issues and appearance defects after painting. SmartRay "WeldVision" 3D inspection solutions can find even the smallest defect, reliably and consistently.

### Why SmartRay 3D?

- Proven, off-the-shelf solution to micro-pore inspection
- Many years specialisation in weld defect inspection
- Highest accuracy and performance solutions avaiable

### 3D Solution Benefits

- Inspects entire weld area surface for micro-pores
- Classifies defects in 3 dimensions
- Creates defect map for every vehicle

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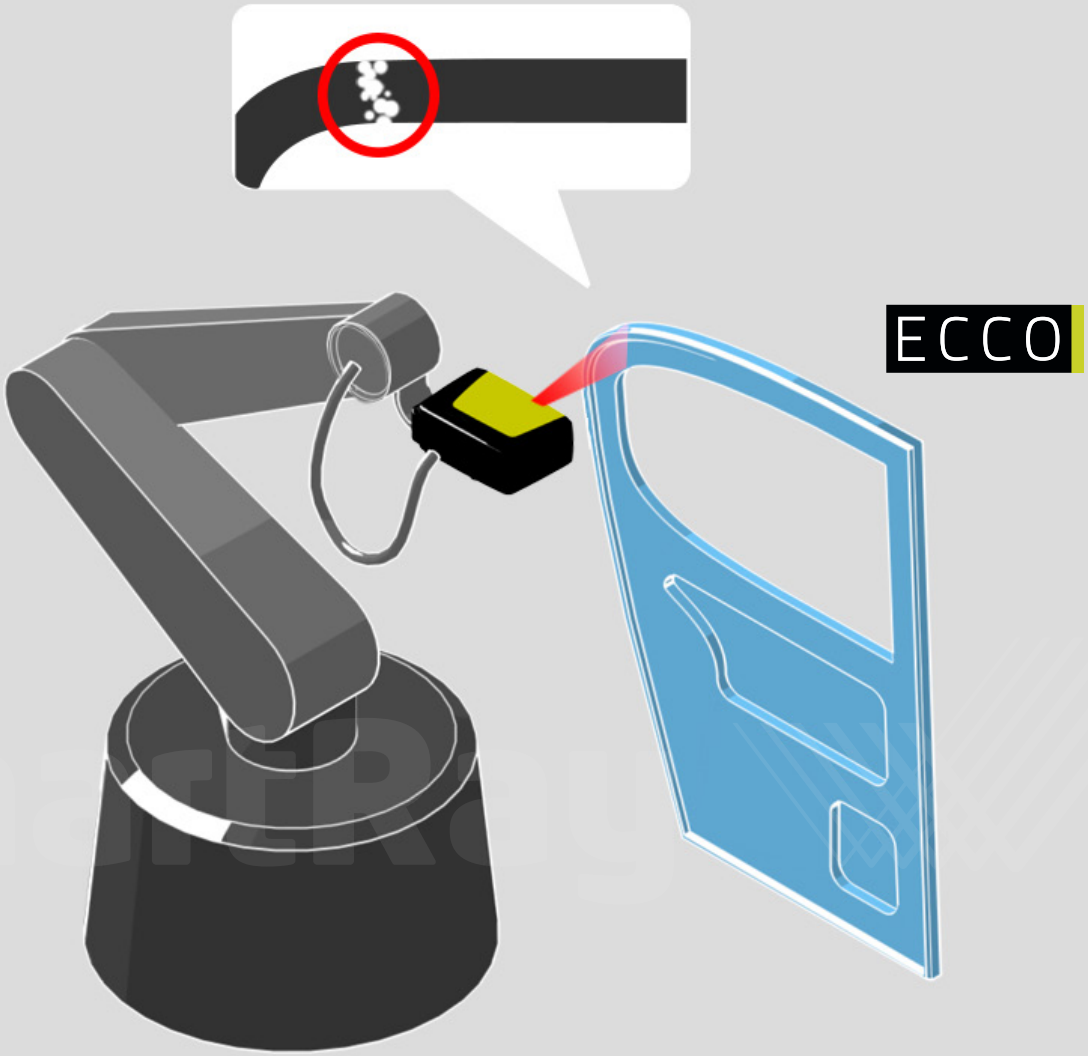
# AUTOMOTIVE | GUIDANCE




## DOOR – WELD SEAM

The crashworthiness of any vehicle is dependent on high quality, consistent welding. SmartRay „WeldVision“ 3D solutions have been developed over many years to deliver high precision geometric inspection and defect detection of complex welded assemblies.

### Why SmartRay 3D?

- Inspects for wide range of welding defects
- Dynamic real-time robot guidance
- Complete analysis of each category of defect

### 3D Solution Benefits

- Improved control of welding process
- Repeatable weld integrity
- Rapid teaching of new parts and inspection criteria

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# AUTOMOTIVE | GUIDANCE


## WHEEL – ASSEMBLY TO VEHICLE

Identifying the relative position and orientation of a vehicle hub and the wheel on a moving production line requires real-time 3D position information. SmartRay 3D guides the assembly robot to attach the wheel to the vehicle in a fully automatic process.

### Why SmartRay 3D?

- Precise alignment of wheel and body inall dimensions
- Accurate real-time robot guidance
- Integrated, compact 3D sensor

### 3D Solution Benefits

- Fully automatic process
- Adaptable to wide range of wheel and hub designs
- Eliminate heavy-lifting manual process

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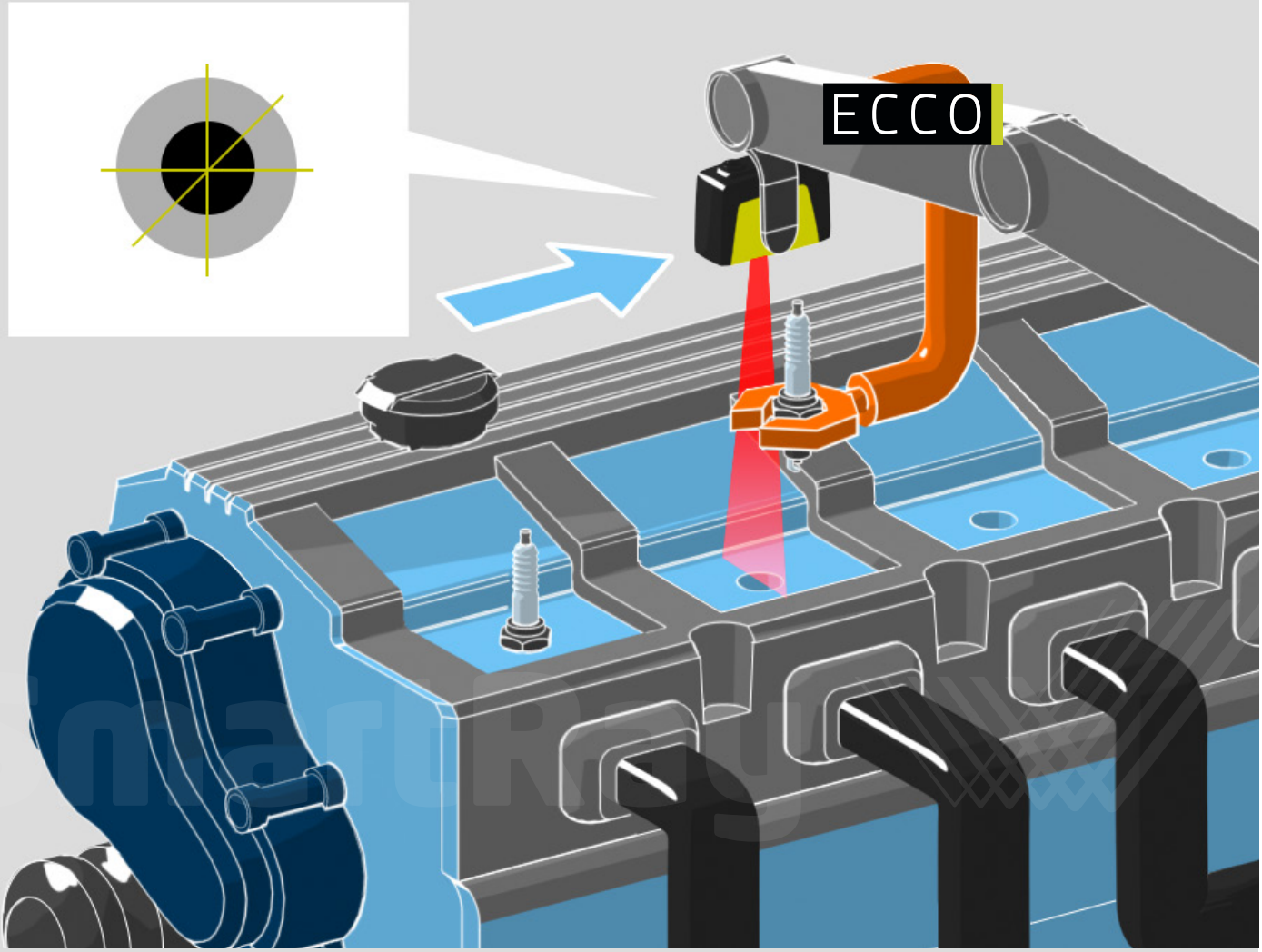
# AUTOMOTIVE | GUIDANCE




## SPARK PLUG – ASSEMBLY TO ENGINE

Accurate alignment of spark plug and cylinder head is essential before assembly to avoid cross threads and correct seating. A SmartRay 3D sensor guides the assembly mechanism in 3 dimensions and checks that every spark plug is fully screwed into the cylinder head.

### Why SmartRay 3D?

- Single sensor for both 3D guidance and 3D inspection
- Compact sensor easy to integrate into automatic assembly system
- Rapid application configuration and integration

### 3D Solution Benefits

- High value solution delivers rapid return on investment
- Application cannot be solved with 2D vision
- Eliminates highly repetitive manual assembly process

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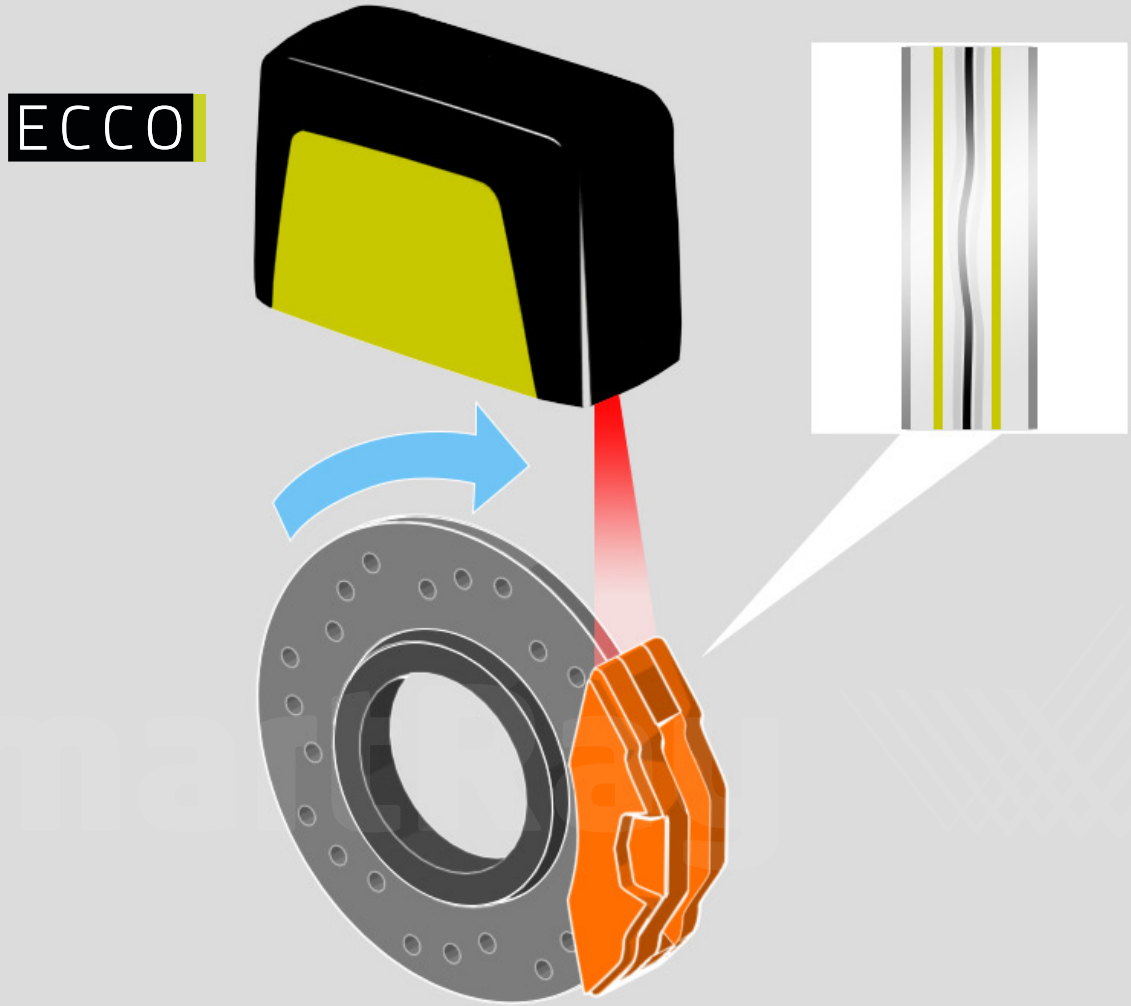
# AUTOMOTIVE | MEASUREMENT




## DISK BRAKE – ALIGNMENT

To minimise break wear, the alignment and position of the break pads relative to the disk is critical. SmartRay 3D helps ensure that every brake pad is accurately assembled and correctly aligned in 3 dimensions, relative to the brake cylinder and disk.

### Why SmartRay 3D?

- Checks alignment and excentricity of disk
- Full 3D measurement and visualisation
- Cost effective process improvement solution

### 3D Solution Benefits

- Improved product consistency
- Improves break pad life and reduces wear
- Reduces warranty claims

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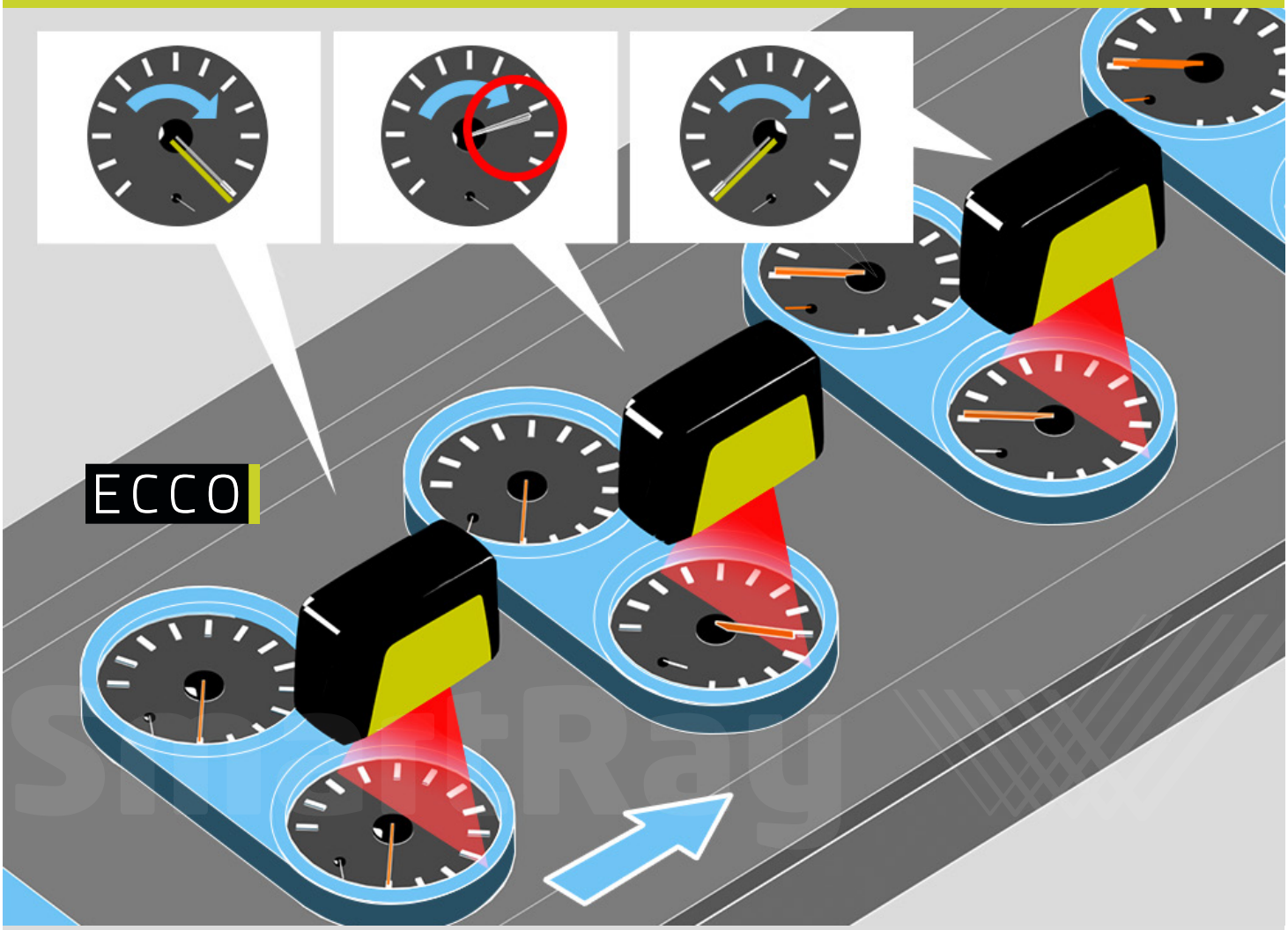
# AUTOMOTIVE | MEASUREMENT




## INSTRUMENT PANEL – COPLANARITY AND ANGLE

Vehicle instrument panels are complex and detailed assemblies that must perform reliably and have an outstanding appearance. SmartRay 3D sensors check that instrument needles remain at the same height and parallel to the dial surfaces at all angles of operation.

### Why SmartRay 3D?

- All inspections carried out during instrument test process
- No calibration or additional lighting required
- Provides corrective feedback for final adjustments

### 3D Solution Benefits

- Improved accuracy of instrument readings
- Enhanced appearance of instrument display
- Closed loop control of instrument manufacture

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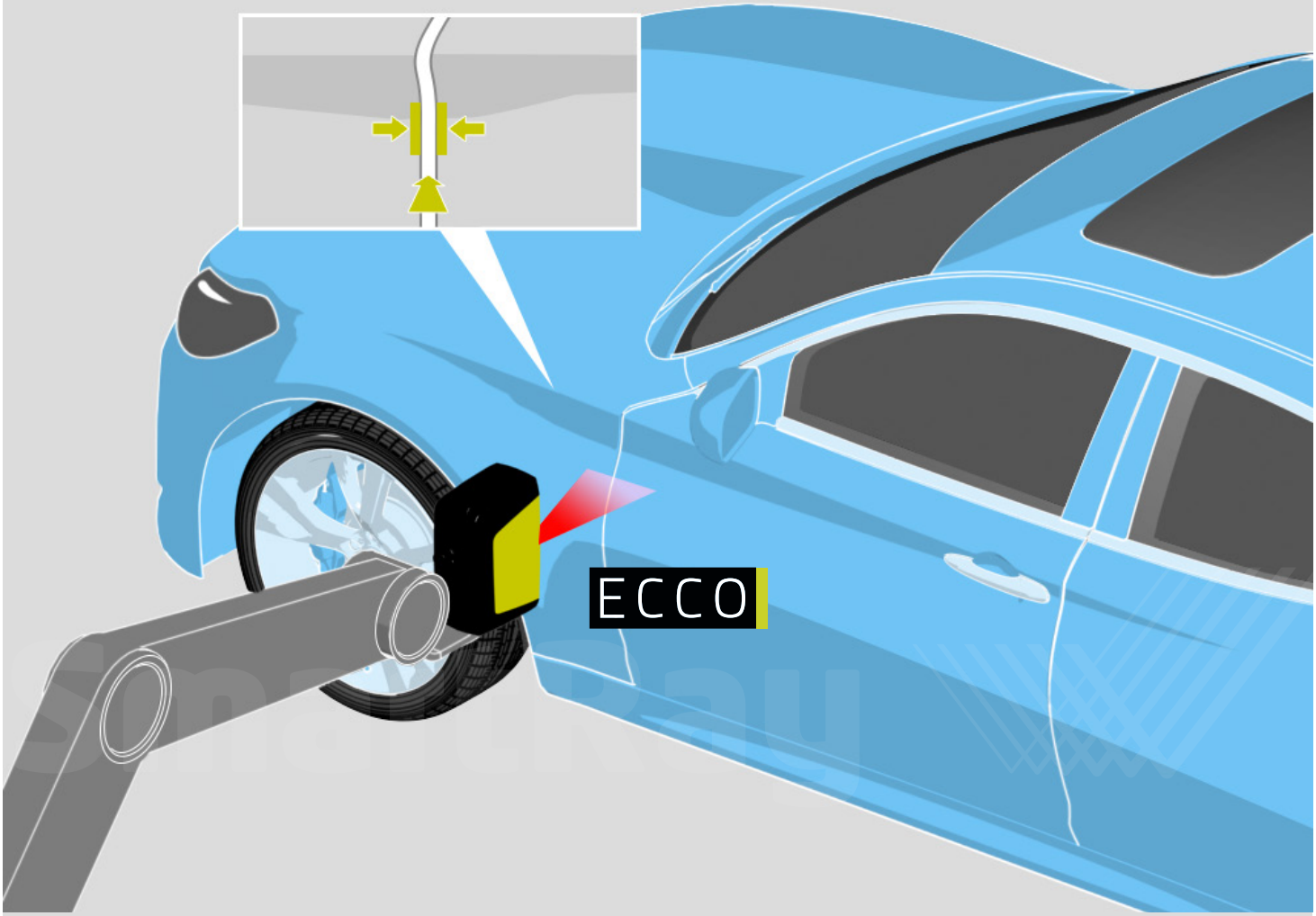
# AUTOMOTIVE | MEASUREMENT




## BODY PANEL – FLUSH AND GAP

The human eye is very good at detecting misalignment between automotive bodies and doors, and variations in the gaps between the panels. Fortunately for vehicle manufacturers, SmartRay 3D is even better at inspecting the flush and gap of complex body panels.

### Why SmartRay 3D?

- Accurate flush and gap measurement
- Unaffected by colour and finish of body panels
- No additional lighting or shielding required

### 3D Solution Benefits

- Improved product finish and appearance
- Measures mulitple points in short cycle time
- Accurate positioning of vehicle not necessary

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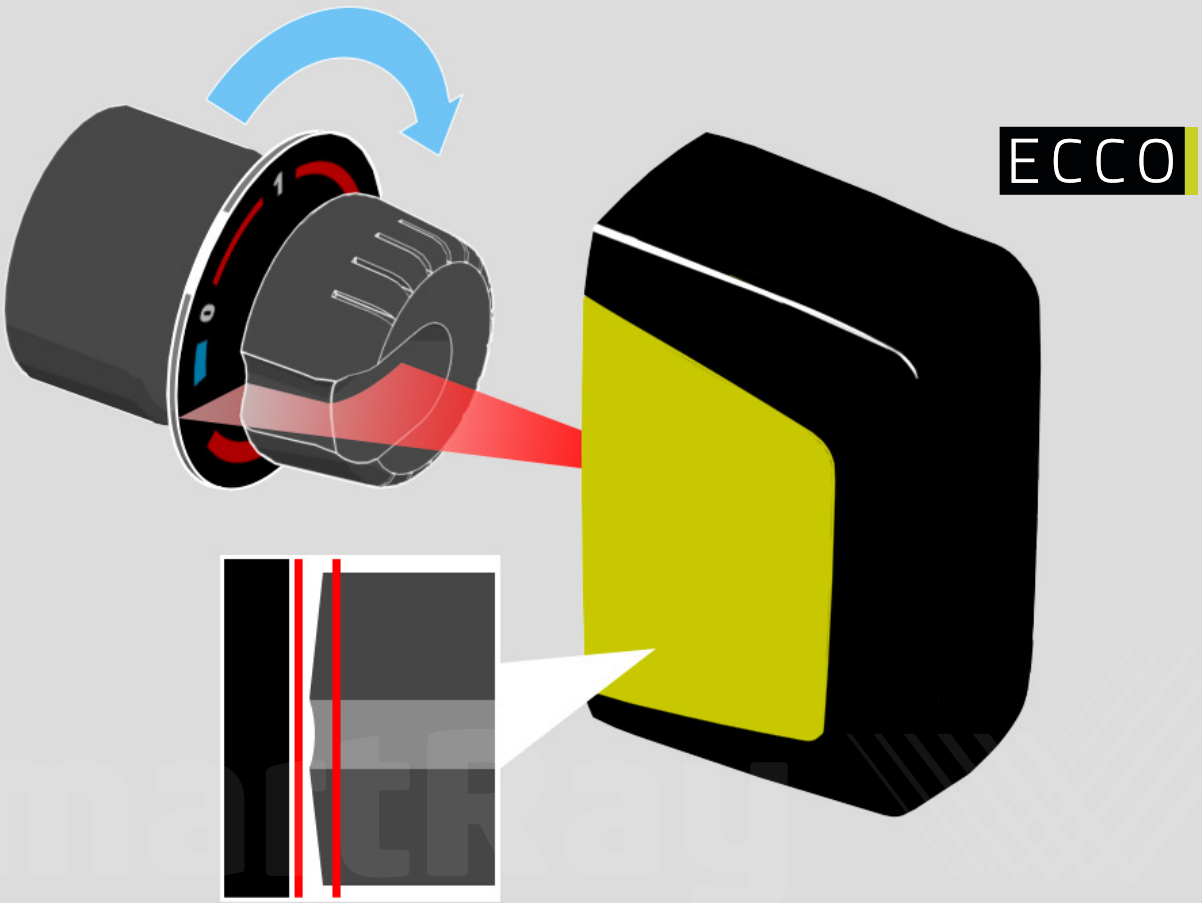
# AUTOMOTIVE | MEASUREMENT




## ROTARY SWITCH – EXCENTRICITY

The touch and feel of rotary switches in premium vehicles is important for the perception of quality. SmartRay 3D sensors inspect any excentricity in rotary switches as they are rotated during testing and checks that height of the switch relative to the dashboard moulding.

### Why SmartRay 3D?

- Single 3D sensor measures both excentricy and height
- Rapid setup of pre-calibrated sensing solution
- Compact 3D sensor takes up minimal space

### 3D Solution Benefits

- Detects any issues with switch operation
- Off-the-shelf packaged sensing solution
- Rapid integration with manufacturing system

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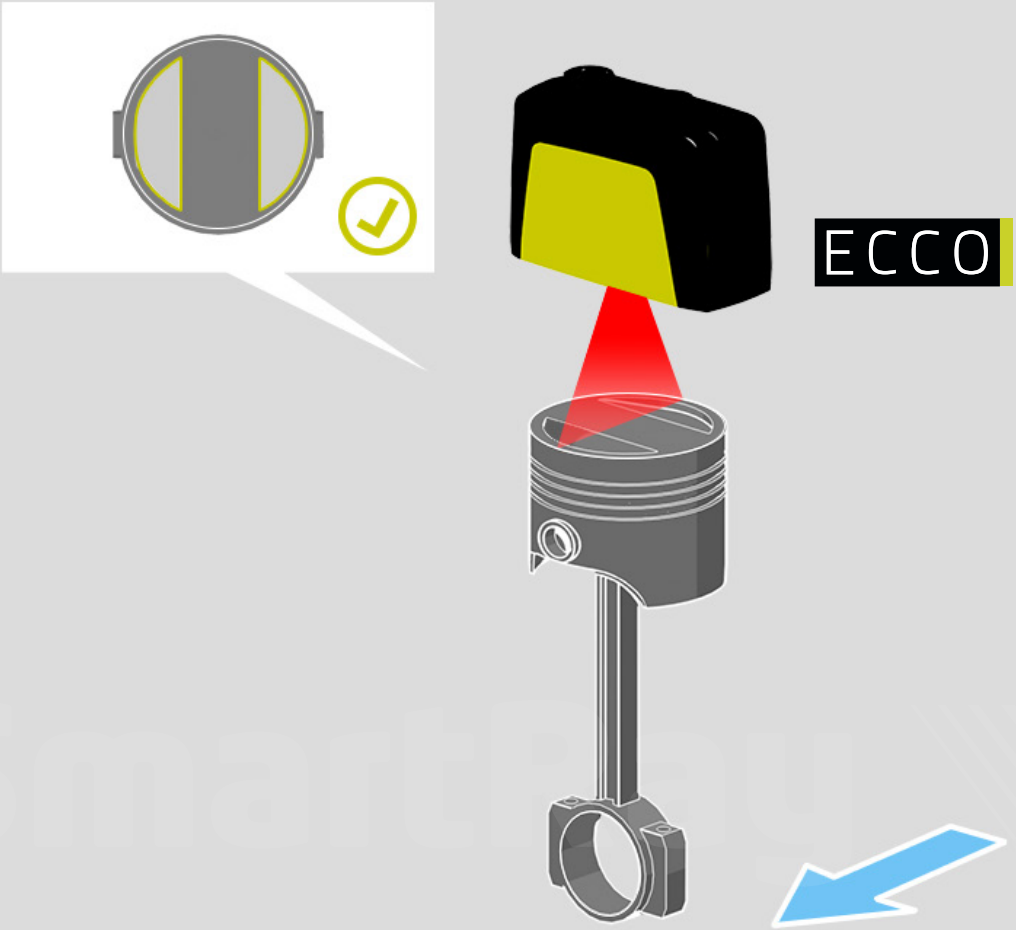
# AUTOMOTIVE | MEASUREMENT




## PISTON – CROWN PROFILE

OEM automotive machine builder application provide integrated machining and inspection solutions to a wide range of automotive customers. SmartRay 3D sensors measure the complex profiles of piston crowns to ensure that they have been cast and machined correctly.

### Why SmartRay 3D?

- High value, reliable, flexible 3D inspection for OEMs
- Wide range of product models for every application
- IP67 rated package ideal for automotive manufacturing environment

### 3D Solution Benefits

- High accuracy 3D measurement of complex profiles
- High speed sensors operate within machine cycle time
- Immediate feedback to machining centre

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# ELECTRONICS | APPLICATIONS

**The Electronics Industry clearly understands how 3D can help improve product quality, reduce manufacturing costs and enable advanced automation.** The following examples show how SmartRay 3D Sensors provide the ideal solution for all kinds of inspection, guidance and measurement applications within the electronics industry. All of these applications benefit from the pre-calibration, integrated optics, built in laser lighting and high accuracy advantages of 3D Sensors over 2D vision systems.

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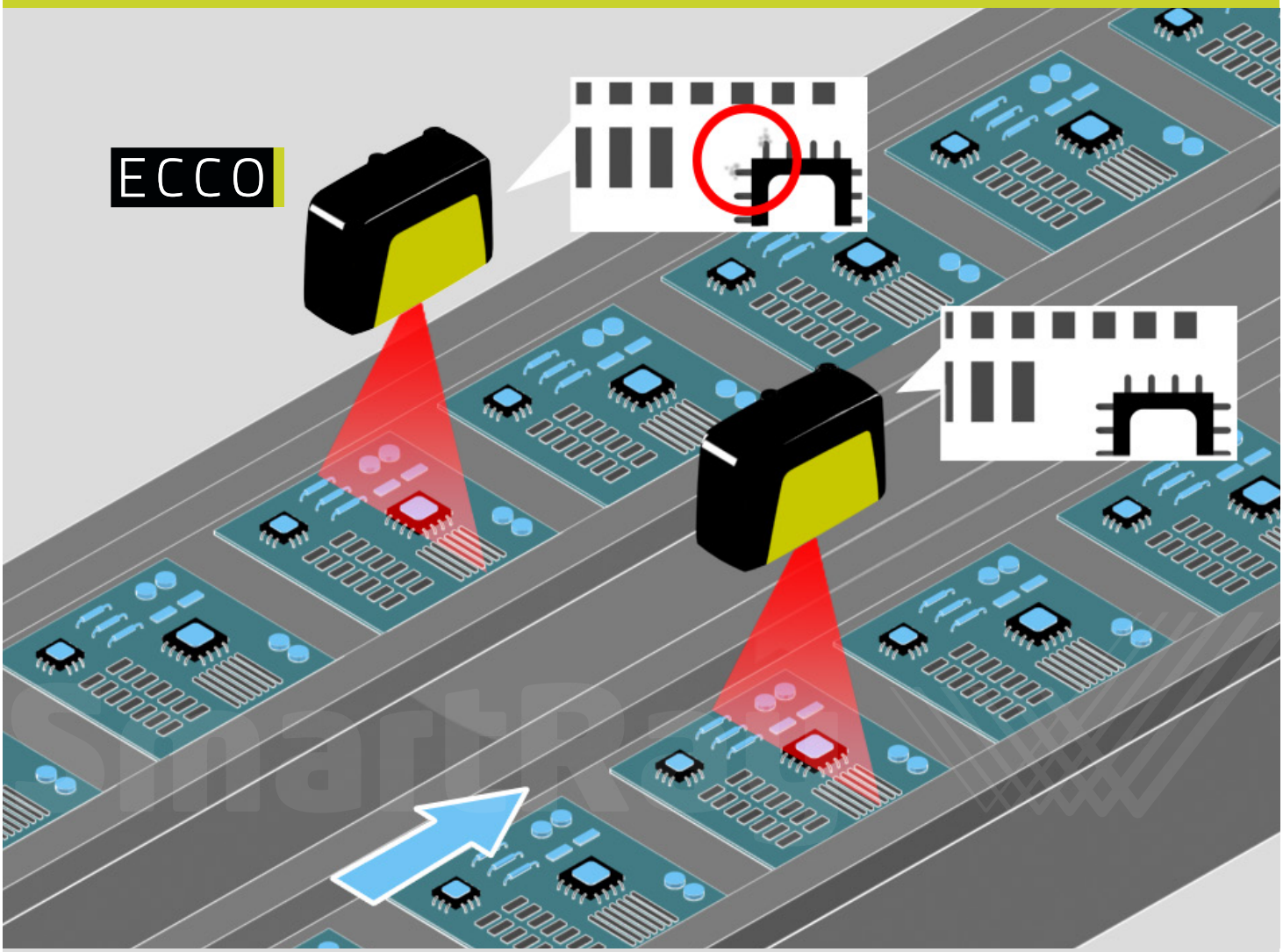
# ELECTRONICS | INSPECTION




## PCB – COMPONENT ORIENTATION

With any PCB it is critical that every component is correctly oriented, is in the right position relative to the solder pads and is seated correctly on the board. SmartRay 3D carries out a complete check of the board and all components both before and after soldering.

### Why SmartRay 3D?

- Checks parts are correctly positioned prior to soldering
- Checks parts are correctly positioned after soldering
- Helps identify incomplete soldering

### 3D Solution Benefits

- The key to "right-first-time" manufacturing
- Inproves yields and reduces scrap rates
- Achieves the quality levels demanded by customers

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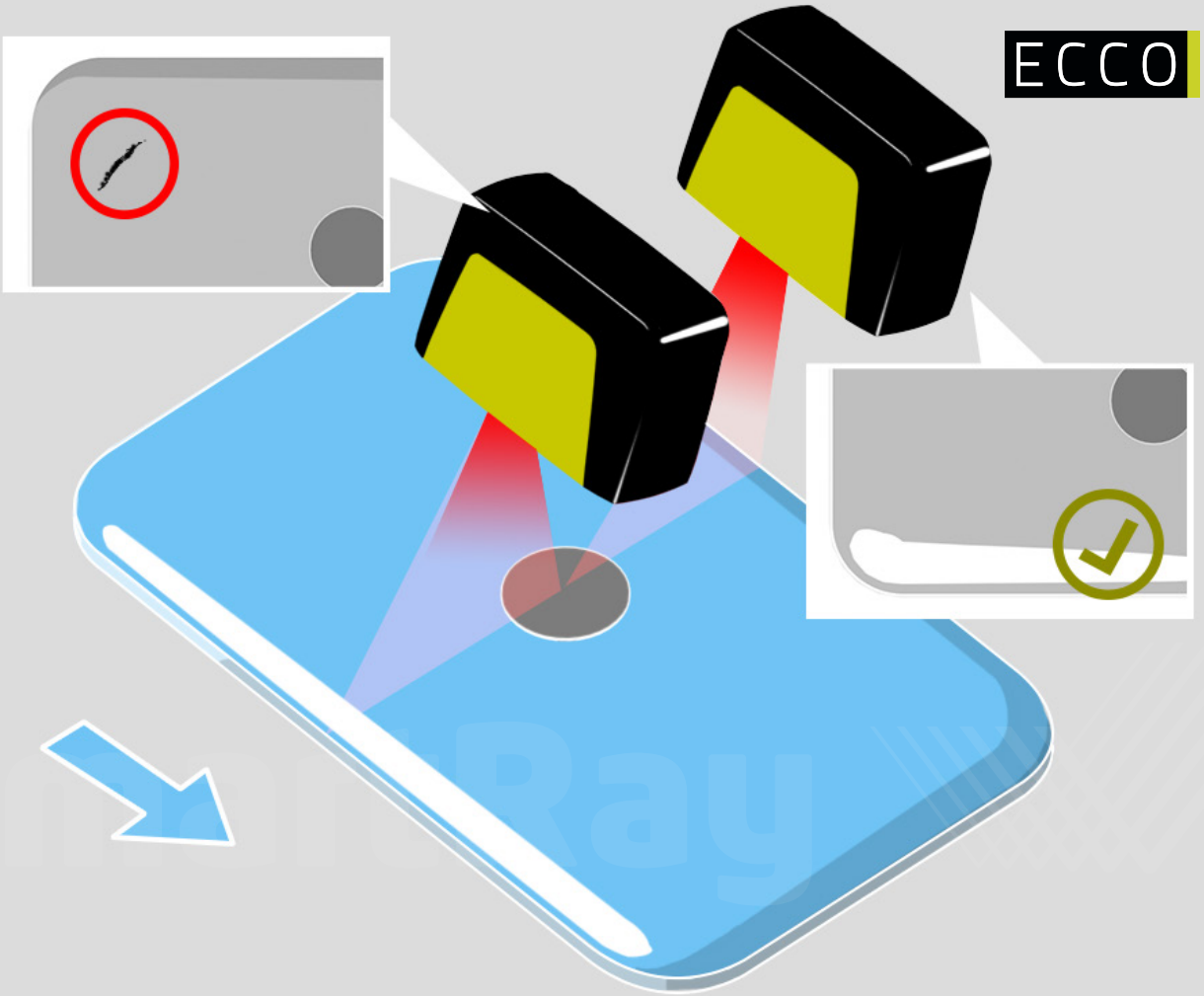
# ELECTRONICS | INSPECTION




## TABLET COMPUTER – SURFACE FINISH

Customer expectations for the quality of tablets is very high. SmartRay 3D helps maintain exceptional quality levels by inspecting the surface finish of both the front glass of the tablet and the rear case, for surface defects and other surface defects.

### Why SmartRay 3D?

- Quantifies surface defects and other surface defects
- Inspects metal, plastic and glass reflective surfaces
- High resolution and speed to detect the smallest defects

### 3D Solution Benefits

- Achieve the highest levels of product finish quality
- Ensure surfaces are defect free before packaging
- Eliminates subjective manual inspection operations

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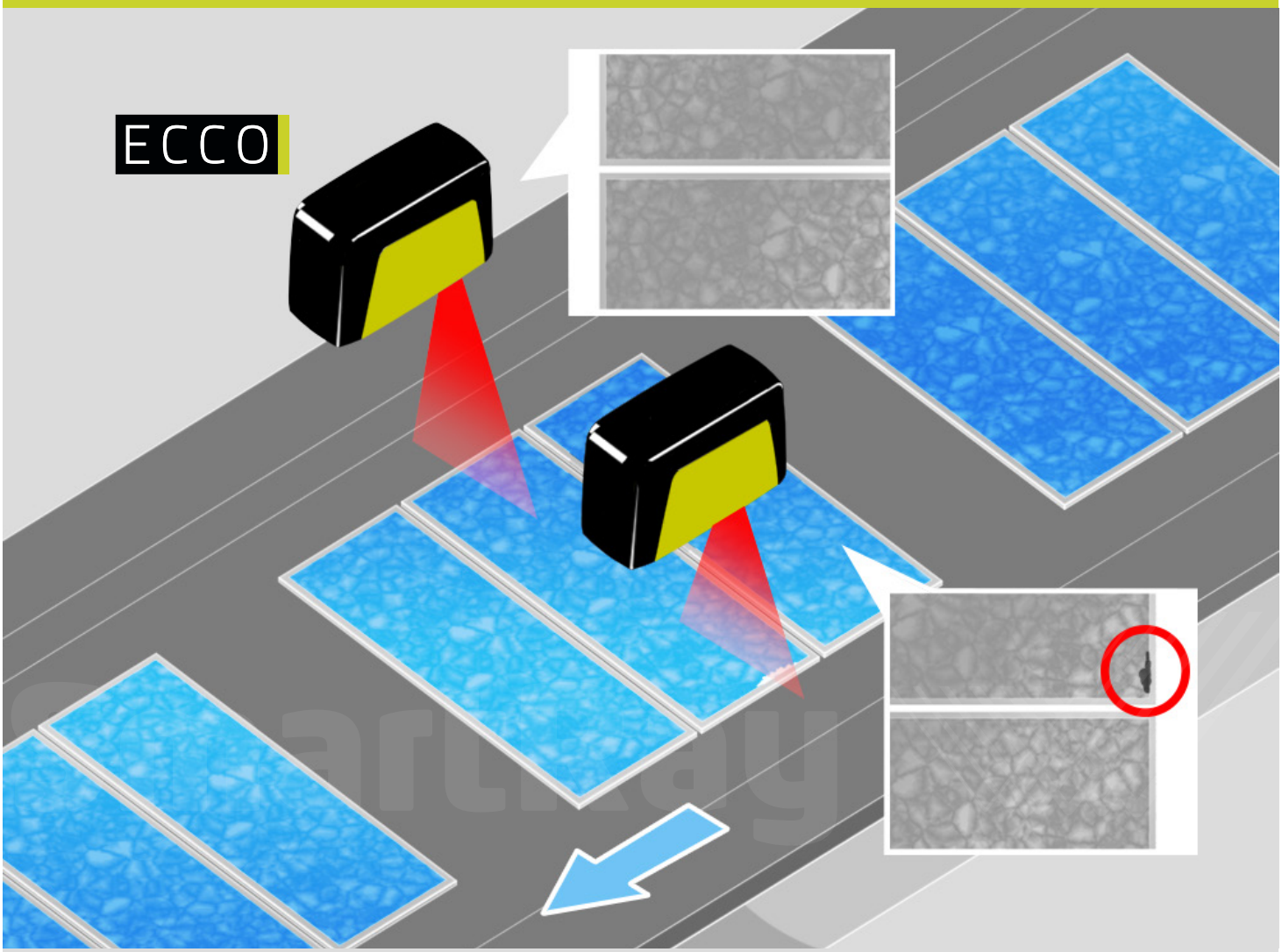
# ELECTRONICS | INSPECTION




## SOLAR CELL – EDGE DAMAGE

Any damage to a solar cell can dramatically reduce conversion effeciency. Inspection with SmartRay sensors during the manufacturing process, identifies and quantifies defects in 3 dimensions, to avoid additional processing stages being applied to faulty cells.

### Why SmartRay 3D?

- Ability to detect damage on low contrast surfaces
- Identifies small defects in brittle material
- Offers the highest resolution 3D sensor available

### 3D Solution Benefits

- Reliable, consistent inspection process
- Identifies defects that would be missed with 2D vision
- Improved product quality and conversion rates

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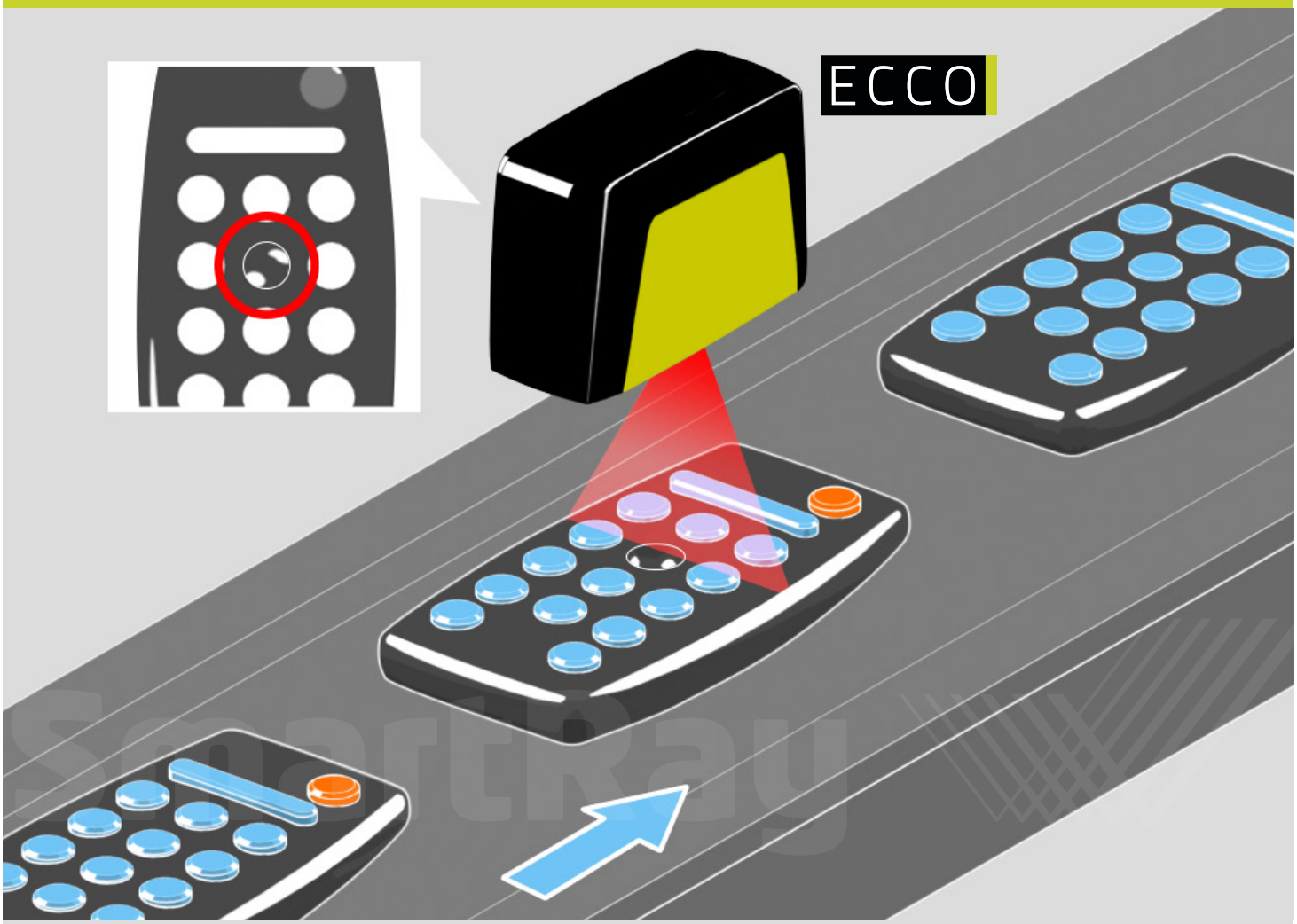
# ELECTRONICS | INSPECTION




## KEYPAD – MISSING OR INCORRECT KEYS

Keypads and keyboards are manufactured in high volume and contain multiple unique parts in each assembly. SmartRay 3D checks that all keys are present, each one is in the correct position, they are correctly oriented and that all the keys are the same height.

### Why SmartRay 3D?

- Check key position, type, orientation and height
- Reading and verifying text and numbers on keys
- Operates reliably even with low contrast parts

### 3D Solution Benefits

- Eliminates shipping defect products to customers
- Identifies production issues immediately they occur
- Helps achieve manufacturing cost reductions

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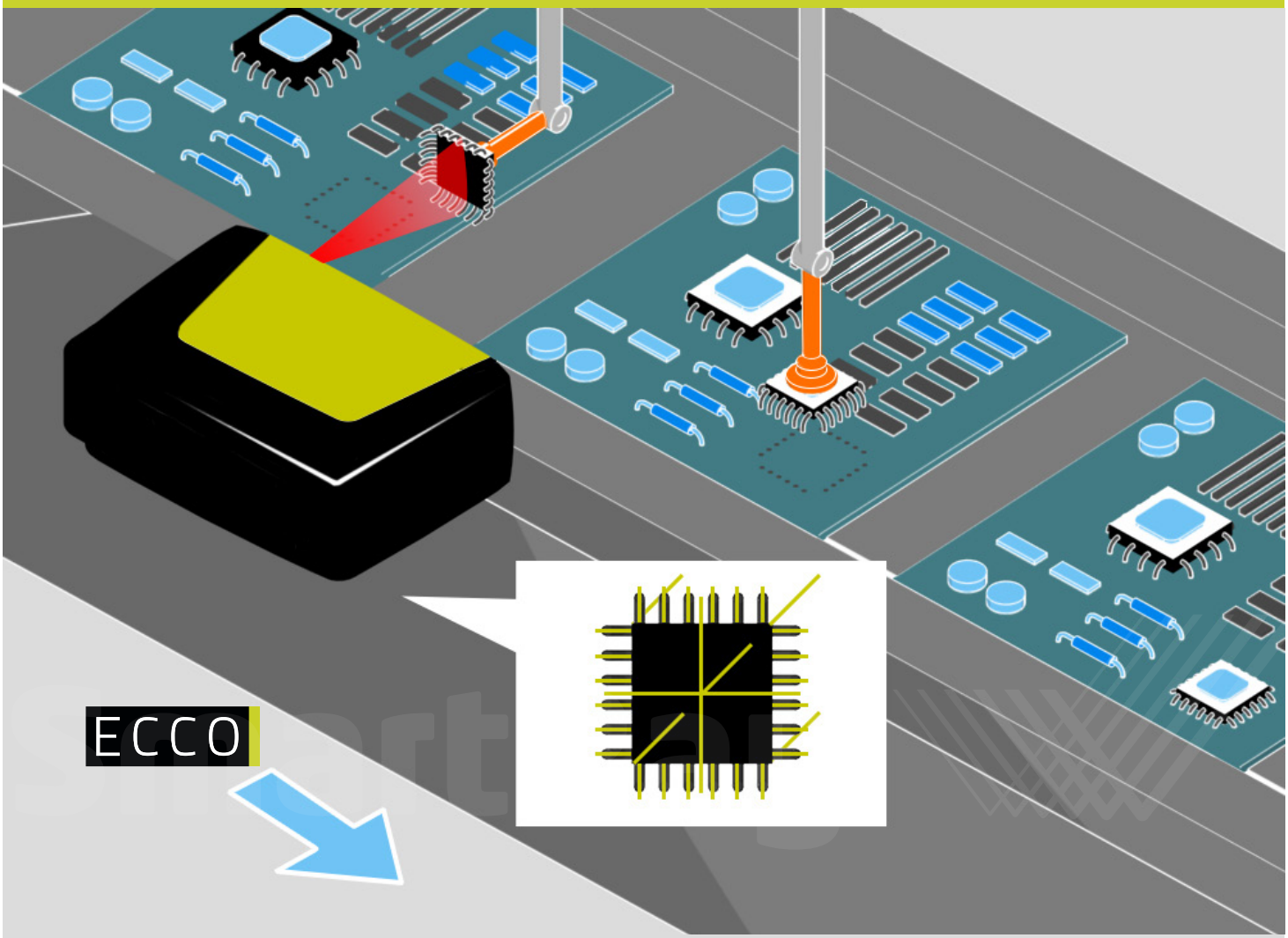
# ELECTRONICS | INSPECTION




## PCB ASSEMBLY – COMPONENT INSPECTION

OEM application with PCB assembly machine manufacturer. A SmartRay 3D sensor scans every component before it is positioned on the PCB. Checks include correct seating in gripper, component orientation, edge and surface damage, size and height.

### Why SmartRay 3D?

- High speed, compact, off-the-shelf solution for OEMs
- Inspection and positioning with single 3D sensor
- Cost effective option for OEM to offer their customers

### 3D Solution Benefits

- Improves PCB assembly machine reliability and performance
- Delivers built-in quality and accuracy control
- No impact on PCB assembly machine production rate

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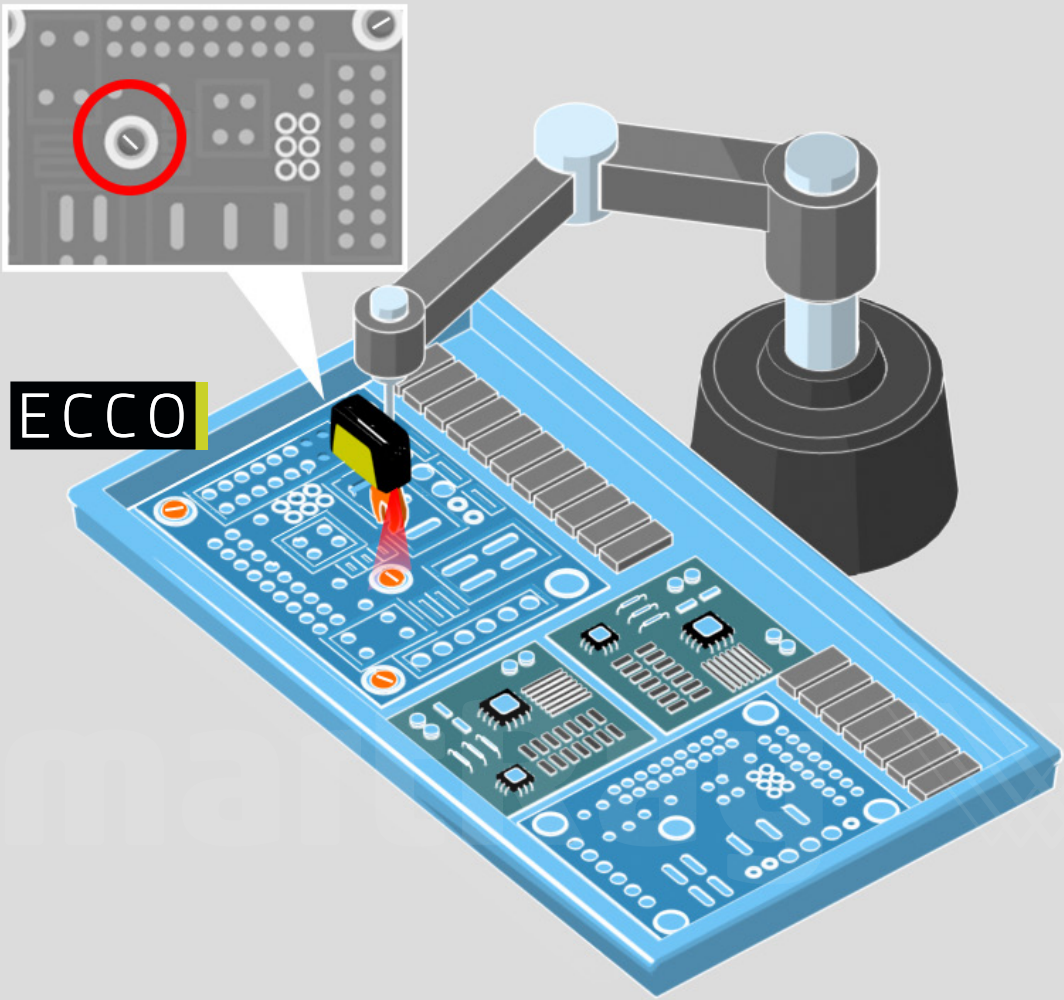
# ELECTRONICS | GUIDANCE




## TELEVISION – AUTOMATED ASSEMBLY

Using robots to assemble high volume products like TVs and Radios has helped drive manufacturing cost reductions. However, for some assembly operations robots need to be guided by SmartRay 3D sensors to ensure all parts are correctly inserted and positioned.

### Why SmartRay 3D?

- Ensures parts are assembled to correct position and height
- Guides robot path in 3D for inserting key components
- Compact 3D sensor built into robot gripper

### 3D Solution Benefits

- Ensures correct and accurate assembly
- Maximises product consistency and quality
- Replaces complex manual assembly processes

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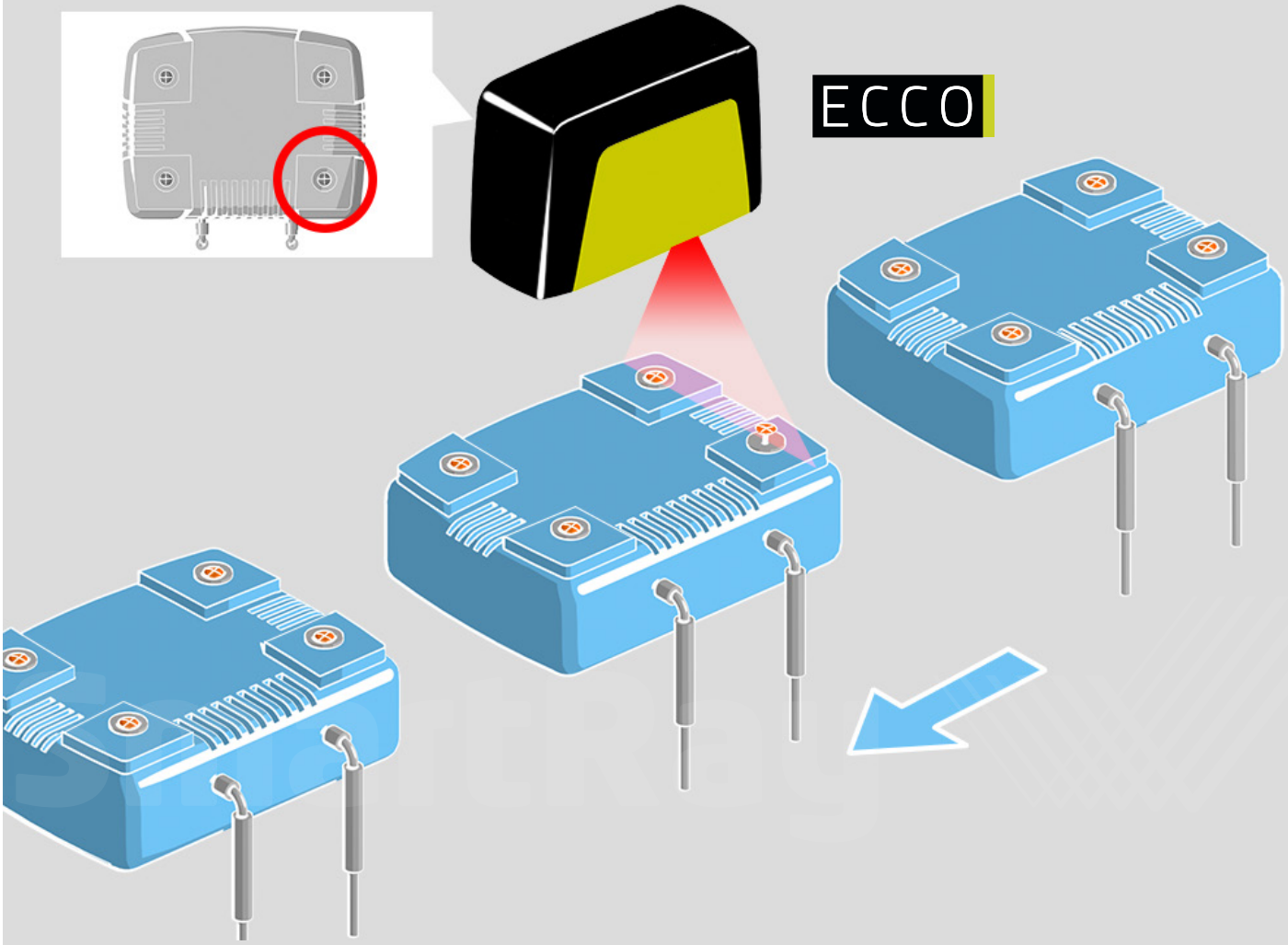
# ELECTRONICS | GUIDANCE




## WIFI ROUTER – SCREW INSERTION

In such a price competitive marketplace, minimising assembly costs and maximising quality are essential. SmartRay 3D sensors check that all screws in each router are correctly inserted and fully screwed down. Any faulty items are automatically sent for rework.

### Why SmartRay 3D?

- Guides screw inserter to correct locations
- Checks all screws are fully inserted to correct depth
- Identifies products that need to be reworked or repaired

### 3D Solution Benefits

- Identifies unseated screws that would be missed with 2D vision
- Operates reliably with black and reflective plastic part
- Reduces manufacturing costs and improves quality

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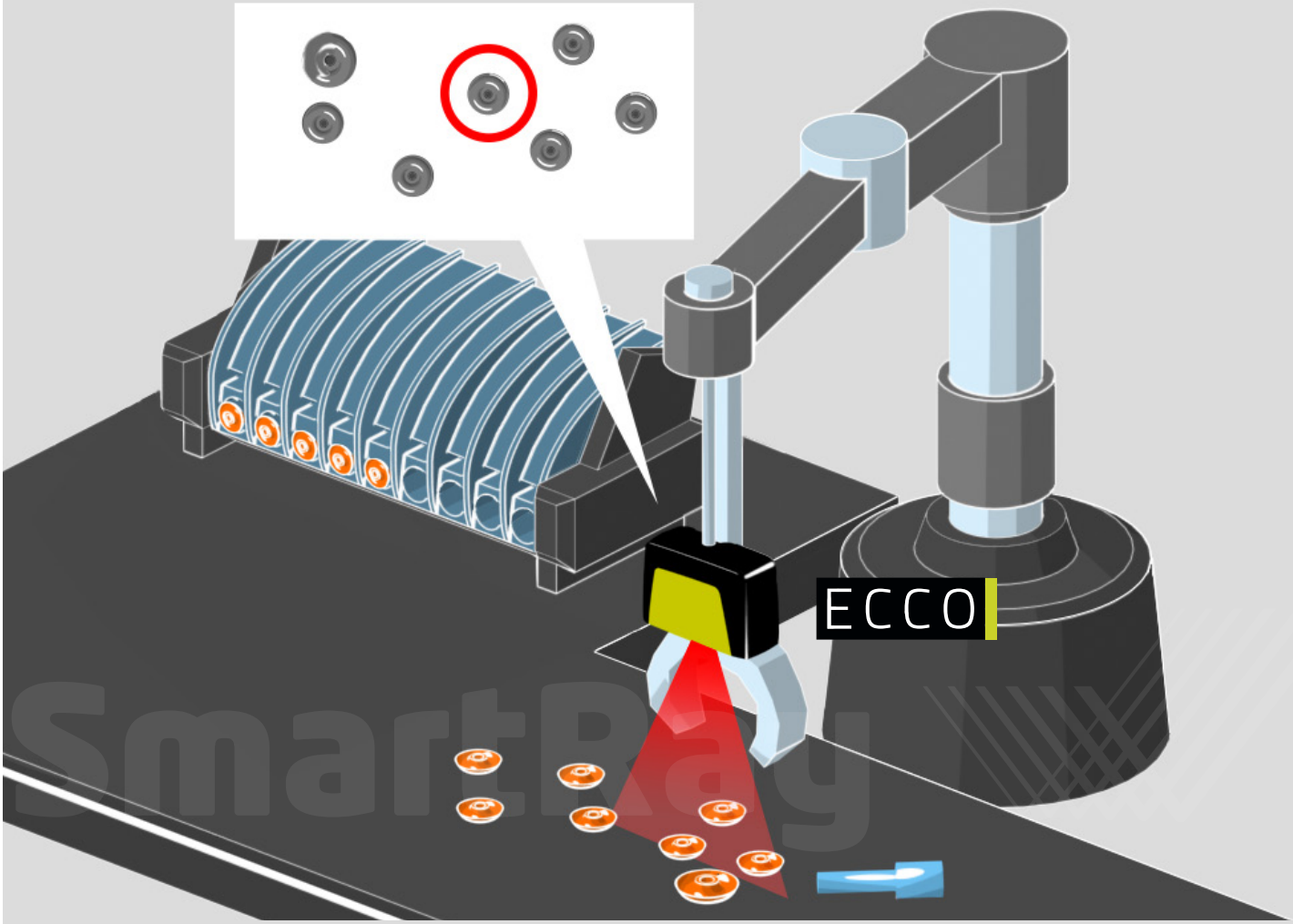
# ELECTRONICS | GUIDANCE




## PRINTER – PICK AND PLACE

During the assembly of ink jet printers, many different parts need to be picked up from various forms of transport packaging. SmartRay 3D sensors help robots and "pick and place" devices identify the location of each part and determine the optimum gripping point.

### Why SmartRay 3D?

- Identifies position and height of parts
- Guides robot to optimum part picking location
- Light weight 3D sensor built into robot gripper

### 3D Solution Benefits

- Allows parts to be picked directly from packaging
- Reduces assembly machine cost and complexity
- Maximises flexiblity for new and changed products

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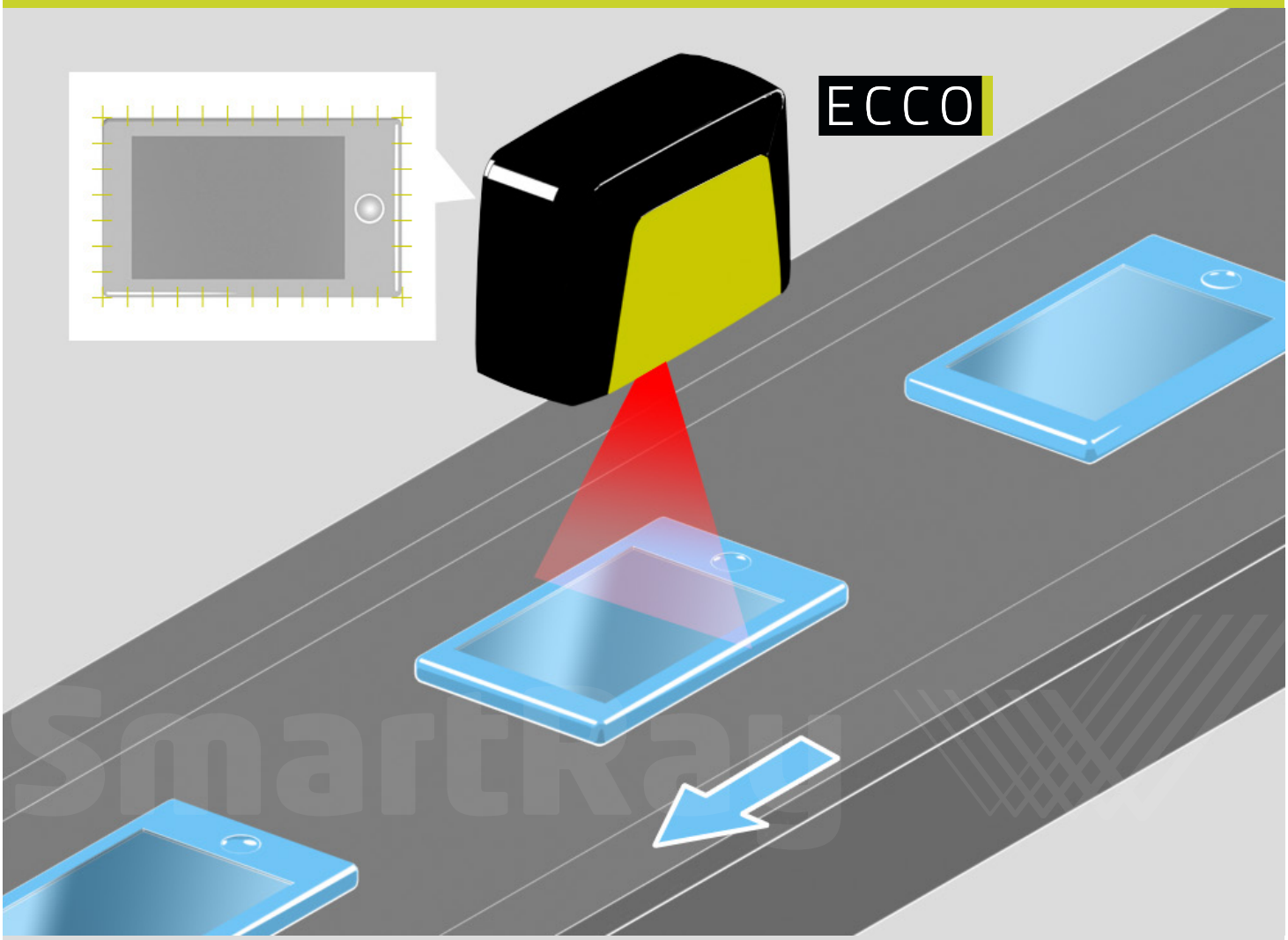
# ELECTRONICS | MEASUREMENT




## SMART PHONE – CASE ASSEMBLY

Smart phones are made to such exacting standards that automatic inspection of every stage of the manufacturing process is critical. SmartRay sensors measure critical gaps and the 3D alignment of key components at each step of the phone assembly process.

### Why SmartRay 3D?

- High precision gauging in all directions
- Measures part alignment and relative heights
- Compact 3D sensors can be fitted easily into production line

### 3D Solution Benefits

- Ensures correct assembly at every production stage
- Provides corrective feedback to production line
- Modular sensor solutions for flexible manufacturin

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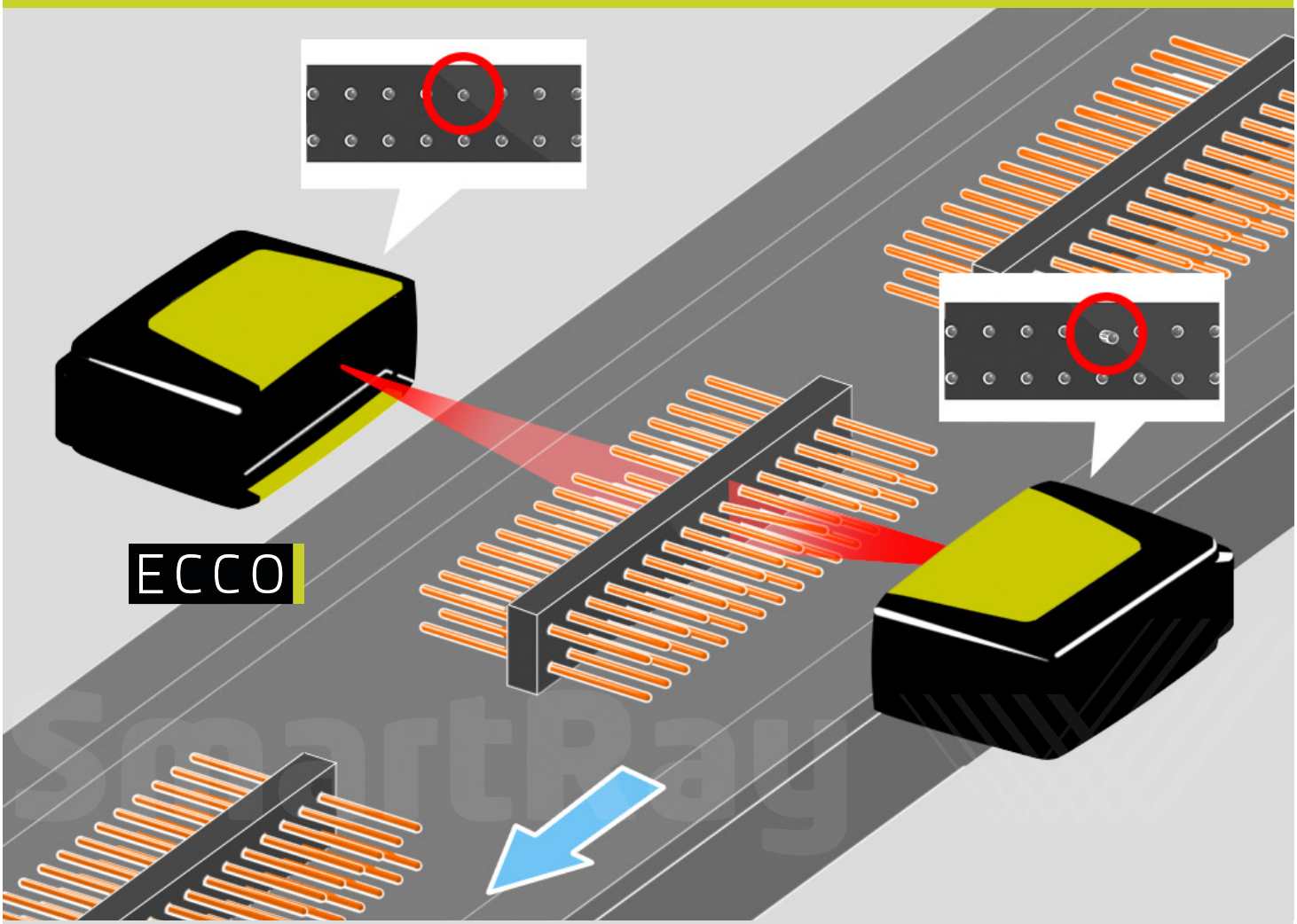
# ELECTRONICS | MEASUREMENT




## CONNECTOR – PIN ARRAY COPLANARITY

With multi-pin connectors, it is essential that all pins are completely aligned and accurately spaced so that they can be automatically inserted into any PCB. SmartRay 3D checks pin position, height and spacing, and also identifies broken, bent or missing pins.

### Why SmartRay 3D?

- Measures pin spacing, postion, height and angle.
- Identifies missing, damaged or broken pins
- Fast processing for the high speed production lines

### 3D Solution Benefits

- Confirms that all connectors meet product specification
- Avoids faulty connectors being shipped to customers
- Provides total control of the manufacturing process

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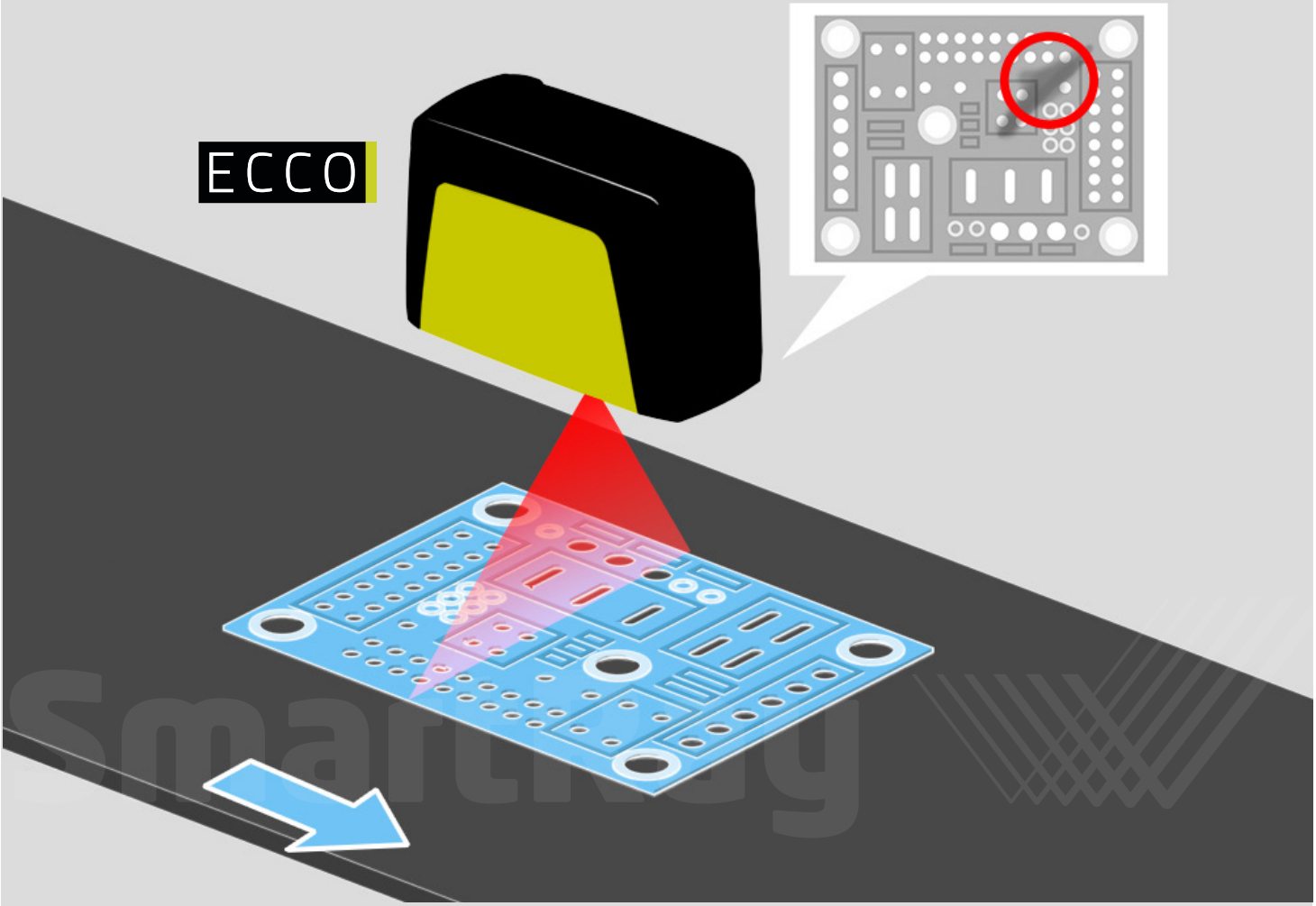
# ELECTRONICS | MEASUREMENT




## PCB BOARD – SURFACE HEIGHT VARIATION

PCBs with excessive variation in their surface height indicate that a problem has occurred at some stage in the manufacturing process. SmartRay 3D accurately measures the height of the entire PCB to indentify any unexpected variations in the surface profile.

### Why SmartRay 3D?

- Measures height of the entire PCB surface
- Cannot be achieved with 2D vision systems
- Unaffected by variations in surface colour or finish

### 3D Solution Benefits

- Ensures all PCBs are flat and without quality issues
- In-line inspection for rapid process feedback
- Pre-calibrated solution for rapid deployment

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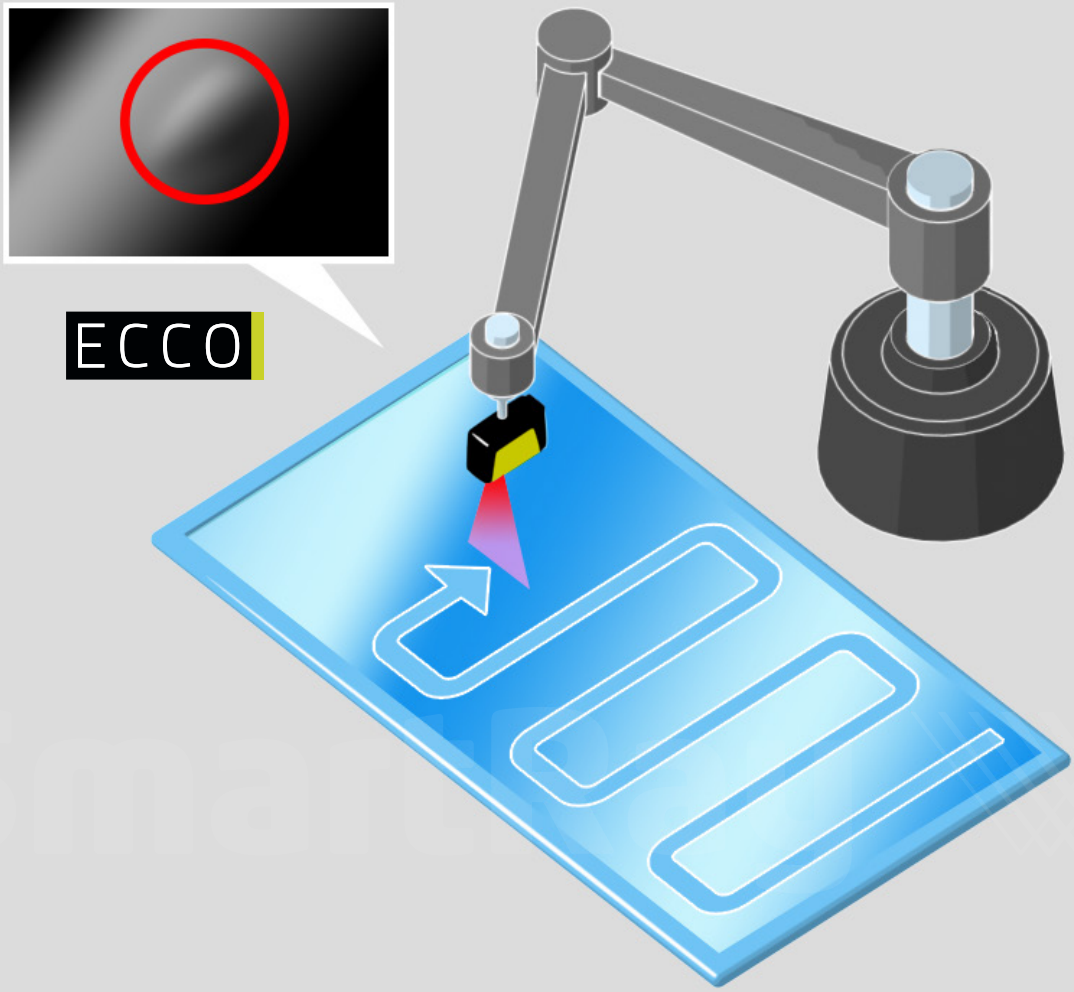
# ELECTRONICS | MEASUREMENT




## LCD DISPLAY – SURFACE DISTORTION

Any distortion in the surface of an LCD display is immediately visible to the viewer. With a SmartRay 3D sensors scanning across the front glass panel of the LCD display, small local variations and larger distortions across the panel can be measured and quantified.

### Why SmartRay 3D?

- Measures variations in height of the entire display
- Operates reliably with transparent glass surfaces
- 2D vision system are unable to make these measurements

### 3D Solution Benefits

- Identifies faulty displays quickly and efficiently
- Eliminates subjective manual inspection
- Cost effective solution to demanding application

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# INDUSTRIAL | APPLICATIONS

**The manufacture of virtually every Industrial Product can be enhanced with the application of 3D Sensors to improve product quality, optimise the manufacturing process and reduce production costs.** SmartRay 3D Sensors are already being used in a wider range of applications, by more companies than ever before. Due to their compact size and light weight, they are easy to fit on any production line. Being pre-calibrated and available in a large range of models they are simple to deploy and highly cost effective.

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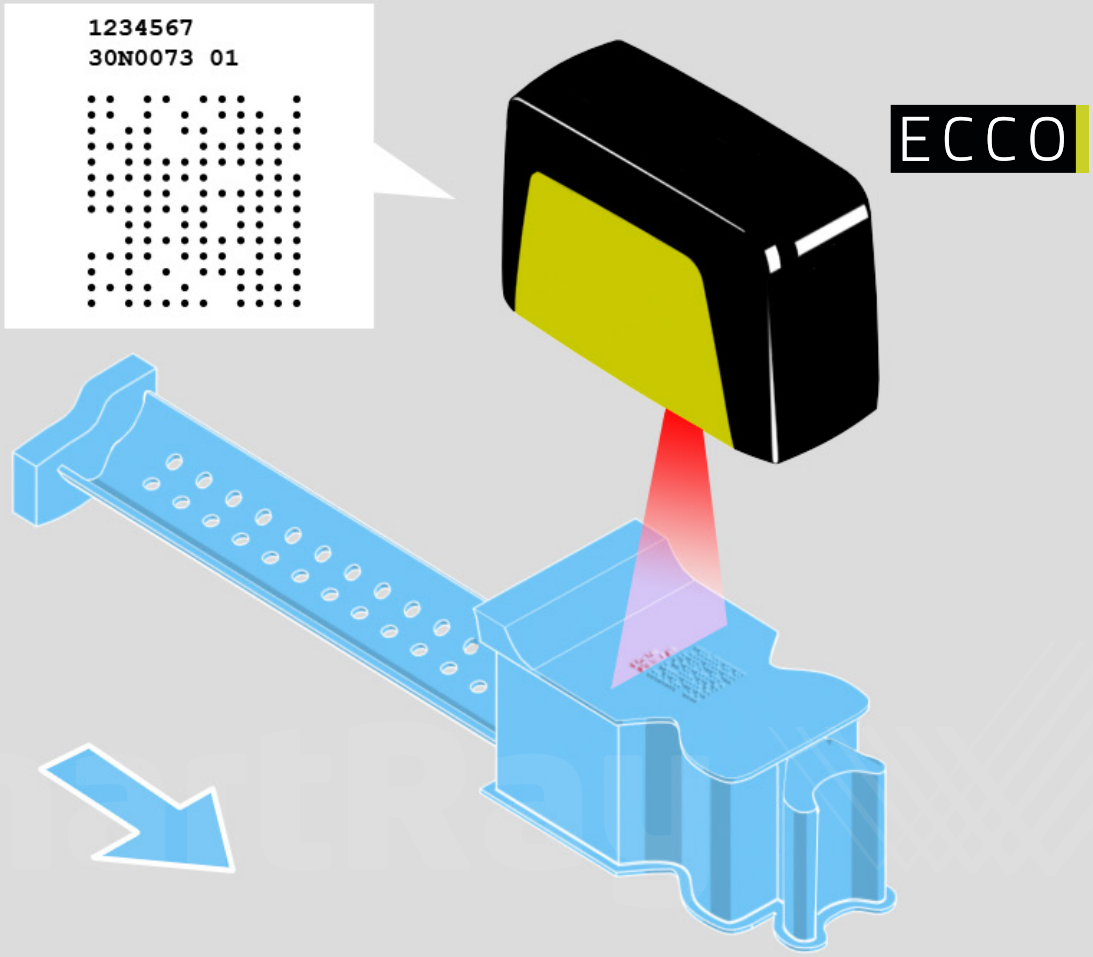
# INDUSTRIAL | INSPECTION




## TURBINE BLADES – READING 2D DOT PEEN CODES

Dot pean code marking is used on many jet engine components so they can be uniquely identified throughout there lifecycle. SmartRay 3D sensors obtain clear, consistent images of these 2D codes irrespective of the surface finish or temperature effects on the turbine blades.

### Why SmartRay 3D?

- Clear image of codes from low contrasts surfaces
- No special or additional illumination is needed
- Feeds images directly to code reading software

### 3D Solution Benefits

- Reliable code reading over lifetime of blade
- Unaffected by changes in blade appearance
- Low cost 3D sensor solution

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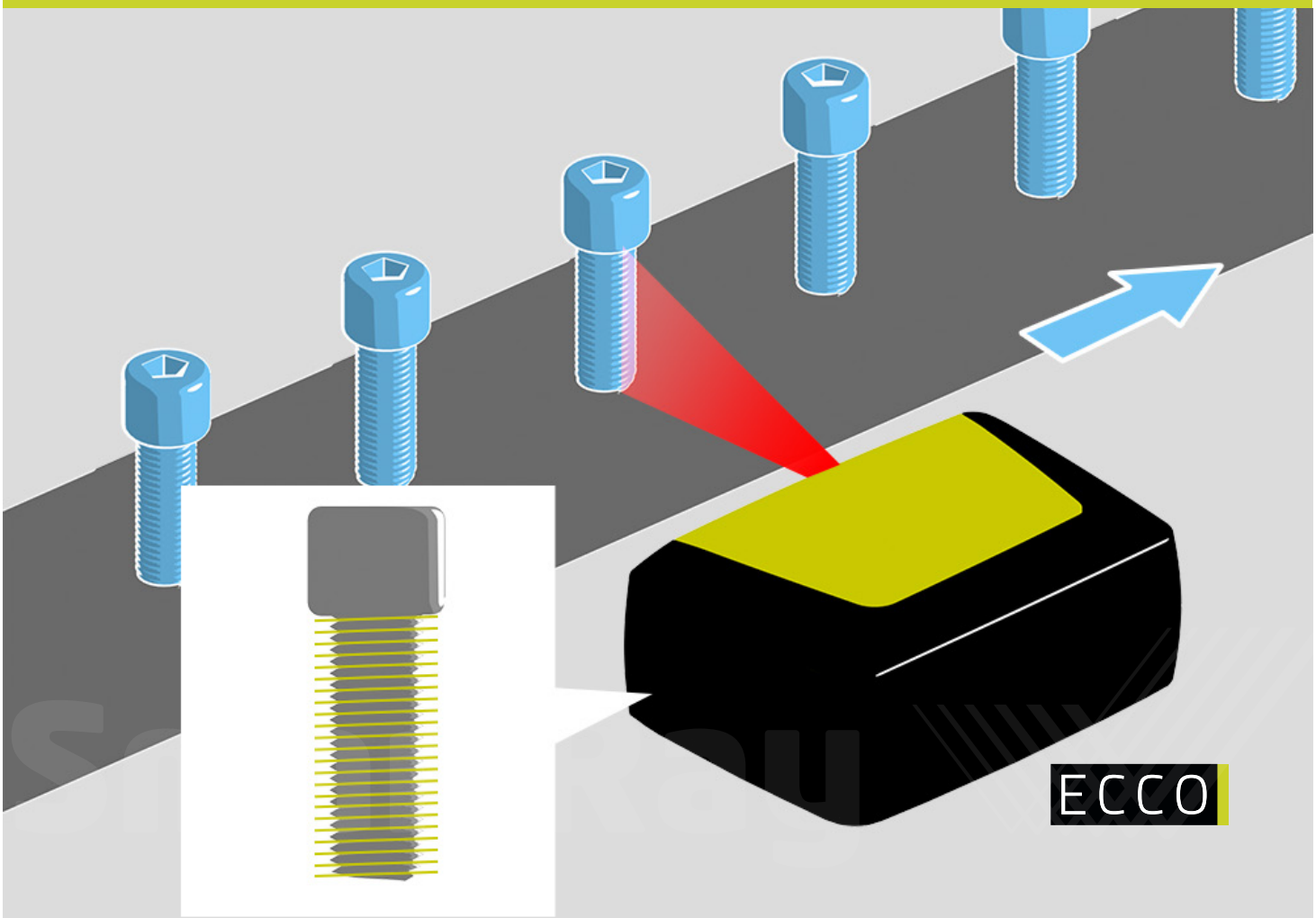
# INDUSTRIAL | INSPECTION




## BOLT – THREAD INSPECTION

Bolts are relatively low cost components, but if a bolt with a damaged or incorrect thread is screwed into a complex metal casting it can cause an expensive problem. SmartRay 3D sensors inspect threads for thread profile, damage and diameter in a single operation.

### Why SmartRay 3D?

- Detects incorrect and damaged threads
- Inspects thread size and profile
- Checks overall length of bolt

### 3D Solution Benefits

- Removes faulty bolts from production process
- Prevents damage and issues with assembled products
- Highly cost effective inspection solution

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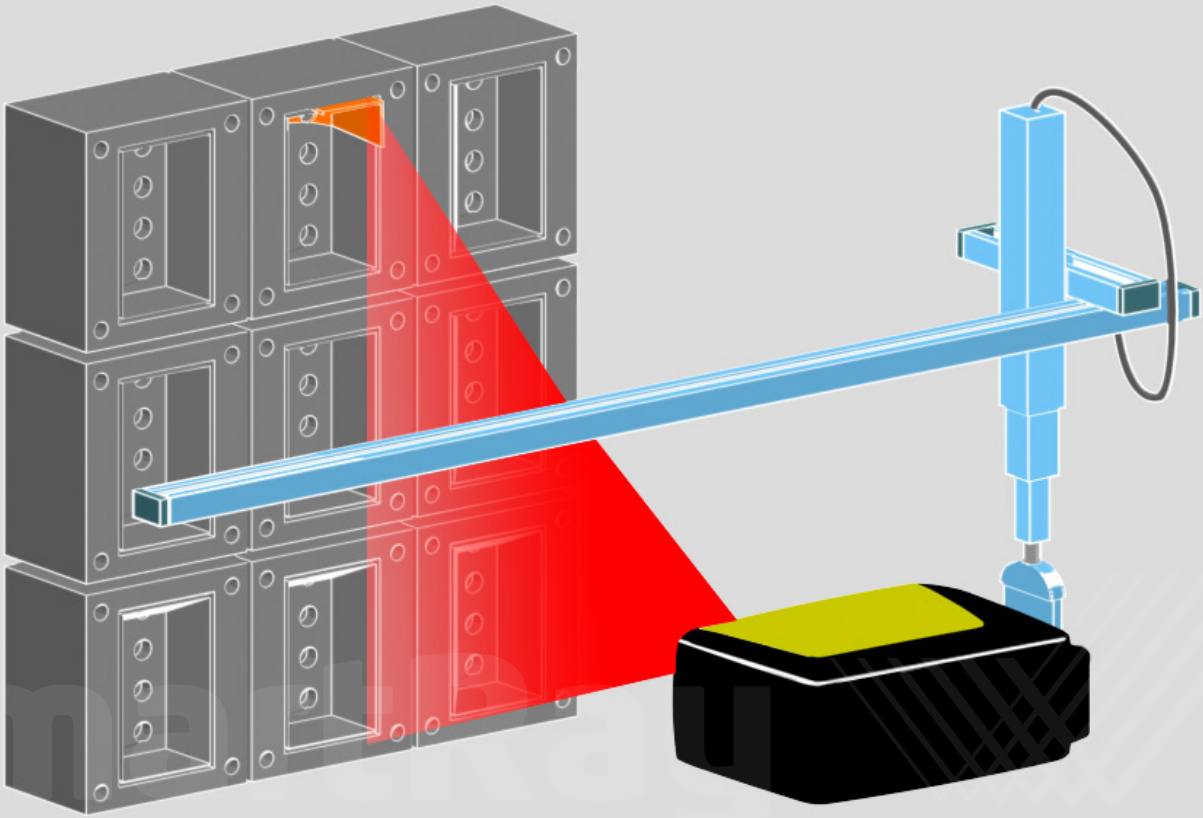
# INDUSTRIAL | INSPECTION



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## INJECTION MOULD – TOOL EJECTION CHECK

If any material is left inside a plastic injection mould tool between cycles, not only is the part that has just been made incomplete, but the following parts will also be faulty. SmartRay 3D inspects the mould tool to make sure that every part has been fully ejected.

### Why SmartRay 3D?

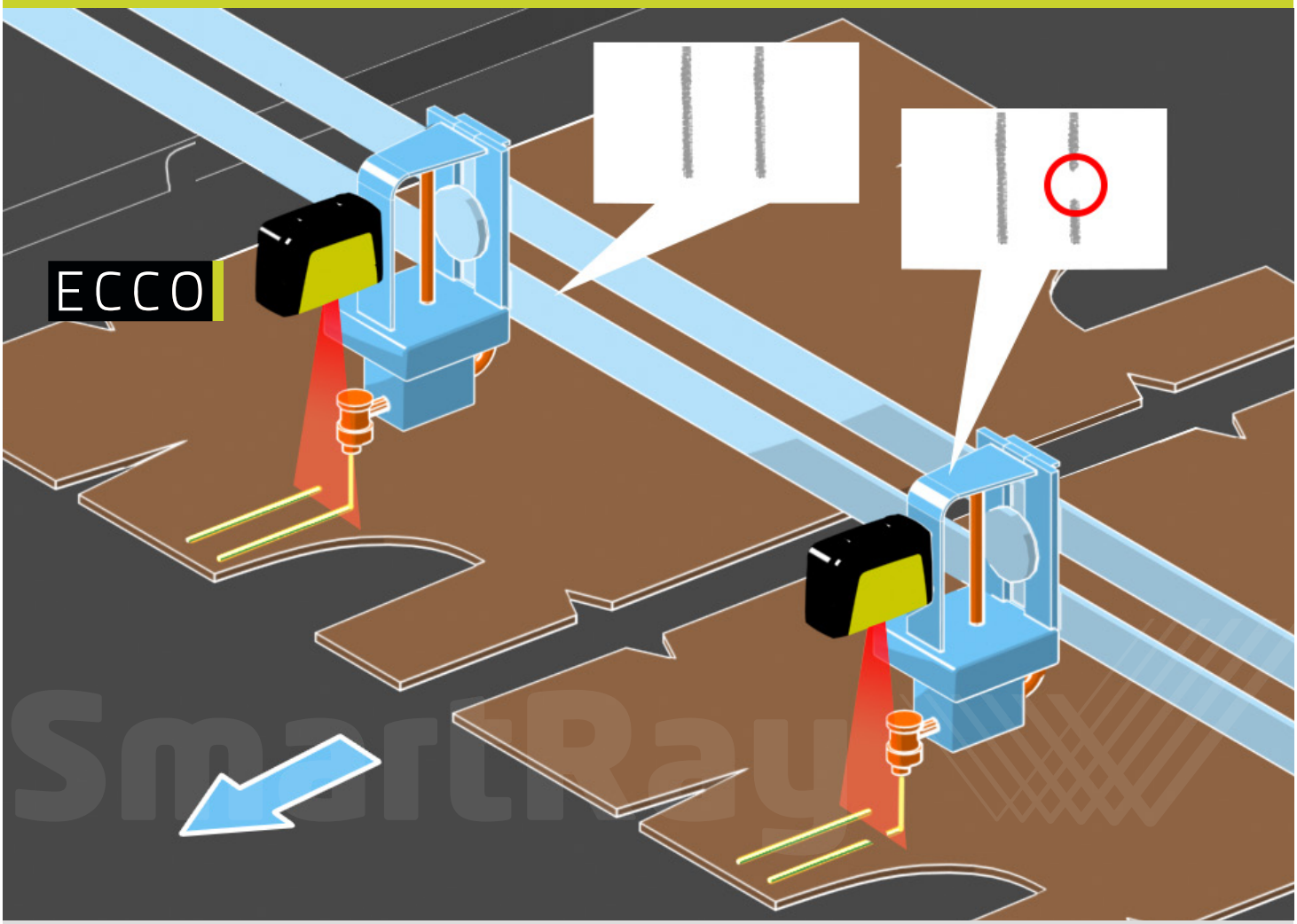
- Detects small plastic parts within mould cavity
- Unaffected by reflective mould tool surface
- Minimal loading on robot from compact, leightweight sensor

### 3D Solution Benefits

- Improves injection moulding yields
- Identifies issues as soon as they occur
- No impact on injection moulding cycle time

SmartRay

# INDUSTRIAL | INSPECTION




## PACKAGING – ADHESIVE DISPENSING

For products to be shipped securely it is vital that they are packaged correctly. Inspecting the coverage and volume of transparent glue on a cardboard surface is hard to monitor manually. But with SmartRay 3D, consitent packaging quality is much easier to achieve.

### Why SmartRay 3D?

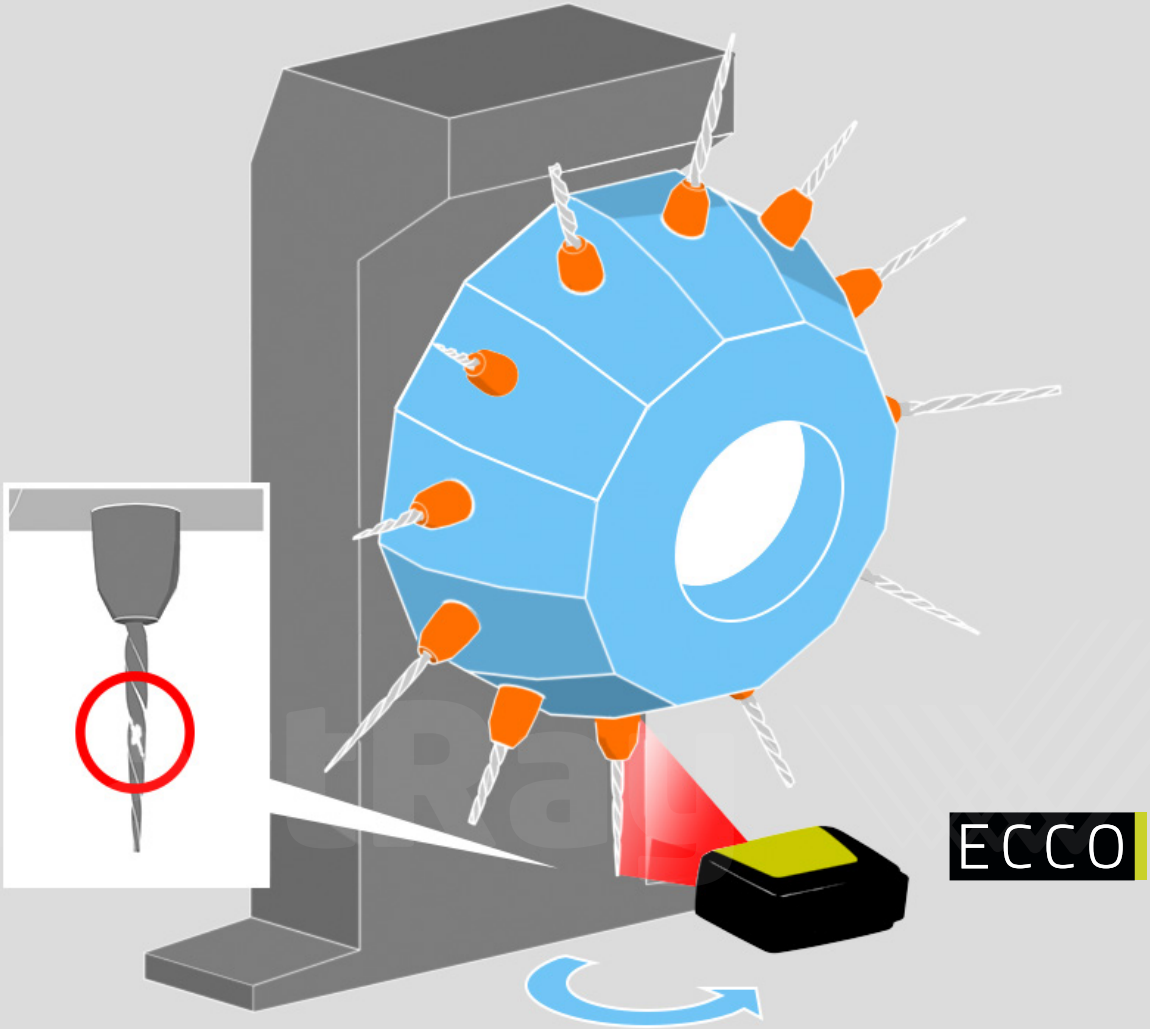
- Checks coverage and detects missing areas of adhesive
- Measures depth of adhesive over contact area
- Unaffected by variations in surface colour or finish

### 3D Solution Benefits

- Identifies issues with adhesive dispensing
- Gives immediate feedback to production line
- Ensures integrity of assembled packaging

SmartRay

# INDUSTRIAL | INSPECTION




## MACHINING CENTRE – TOOL DAMAGE

Machining centres use a vast array of different interchangable tools and often run for long periods without human intervention. SmartRay 3D is ideal for inspecting each tool for damage before the start of the machining operation it is about to be used for.

### Why SmartRay 3D?

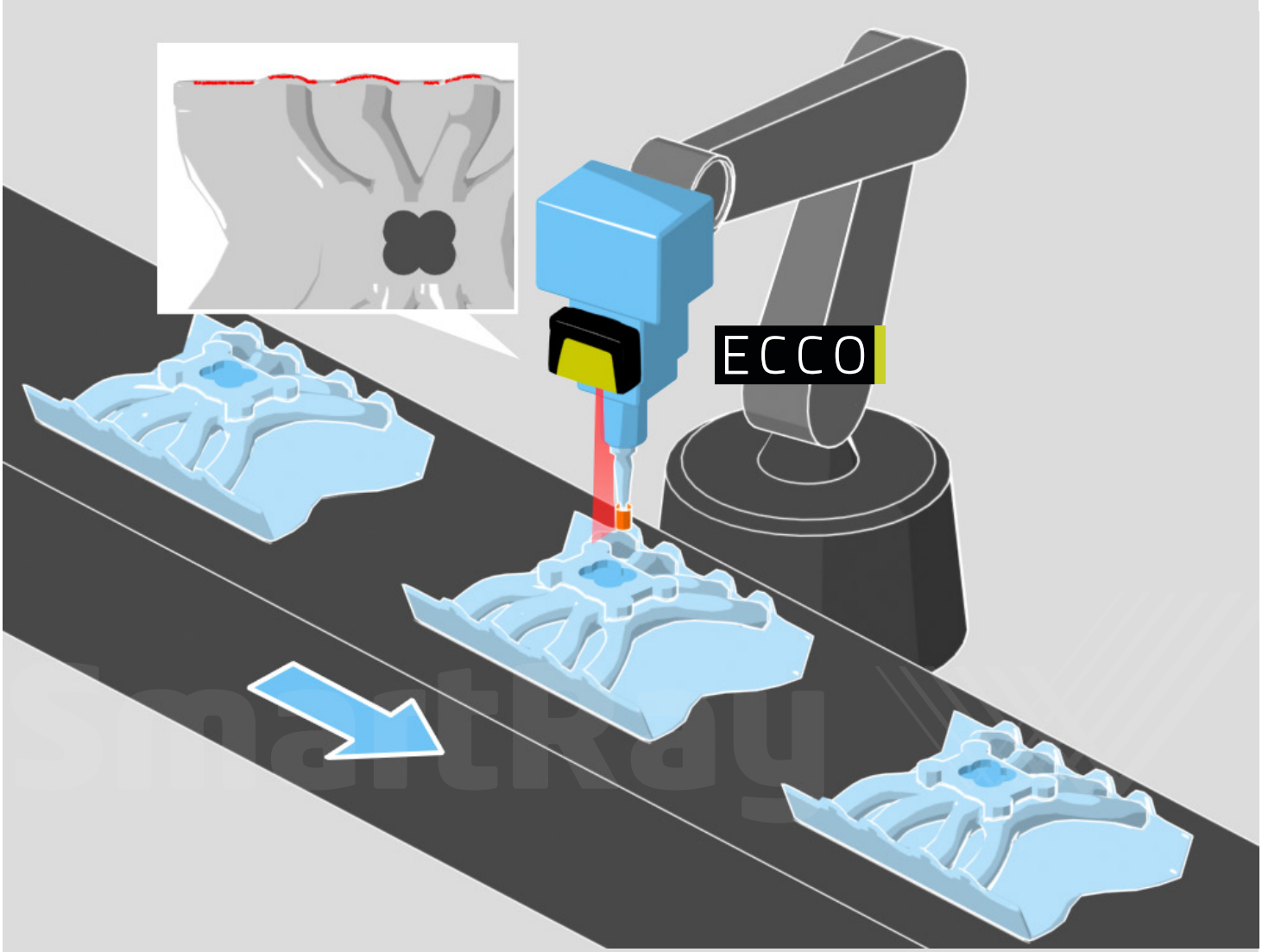
- 3D dimensional verification of entire tool
- Compact and self-contained 3D sensor
- IP65 rated 3D sensor housing

### 3D Solution Benefits

- Detects damaged tooling before machining starts
- Monitors tool wear
- Simple mechanical installation

SmartRay

# INDUSTRIAL | GUIDANCE




## CASTING – DEBURING TOOL CONTROL

There are inevitable variations in the shape and size of burrs on aluminium castings. A deburring robot fitted with a SmartRay 3D sensor automatically identifies the burrs to be removed and is guided to remove just the right amount of material.

### Why SmartRay 3D?

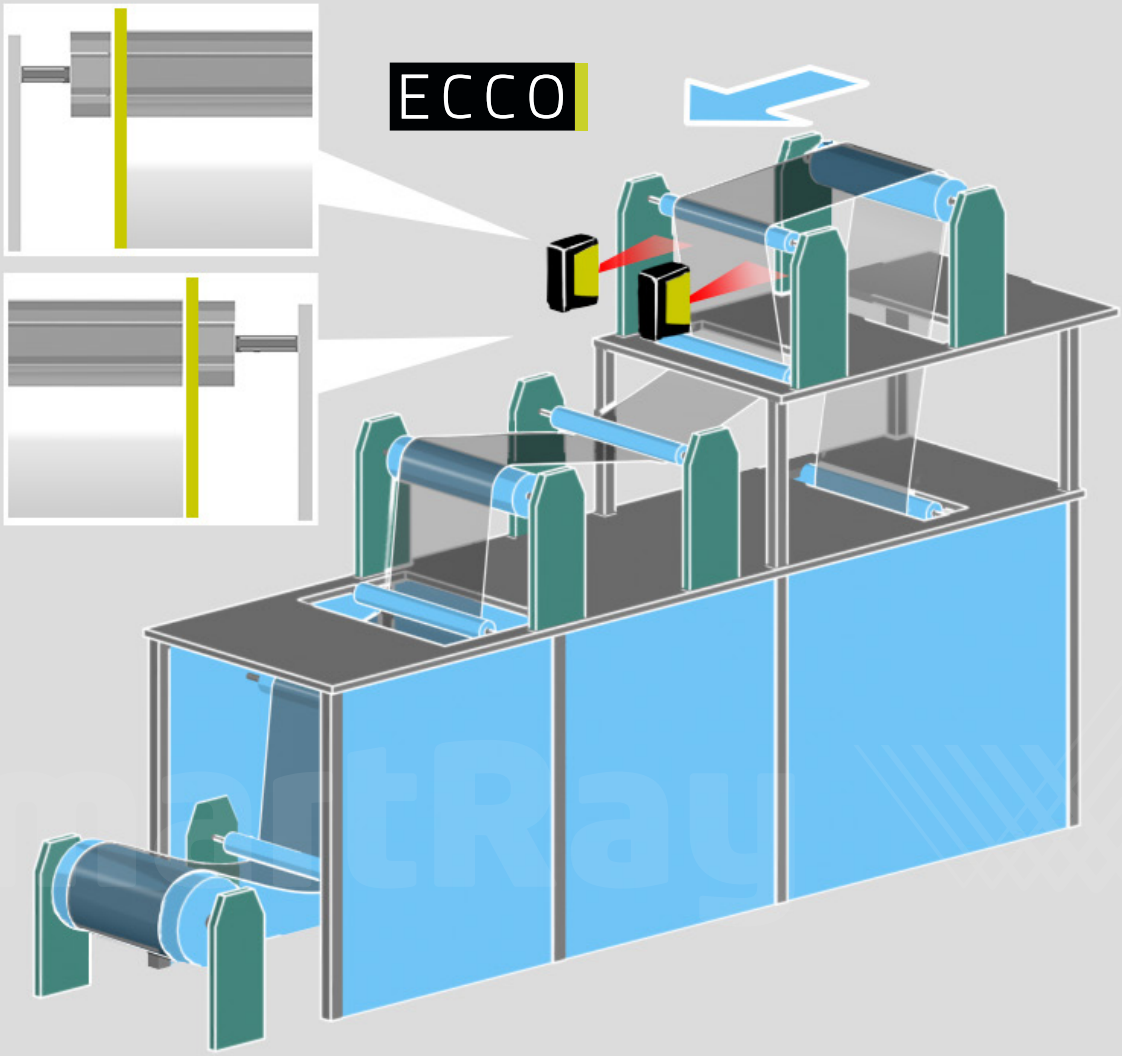
- Precise measurement of burrs requiring removal
- Guides robot deburring path
- Inspects casting after deburing process

### 3D Solution Benefits

- Fully automated deburring process
- Compensates for variations in size of burrs
- Eliminates unpleasant manual process

SmartRay

# INDUSTRIAL | GUIDANCE




## PLASTIC FILM – CONTINOUS EDGE TRACKING

When manufacturing continuous flat sheet material it is important to be able to track the position of both edges to control the width, position and thickness of the sheet. SmartRay 3D sensors provide continuous dimensional feedback even with very thin or transparent material.

### Why SmartRay 3D?

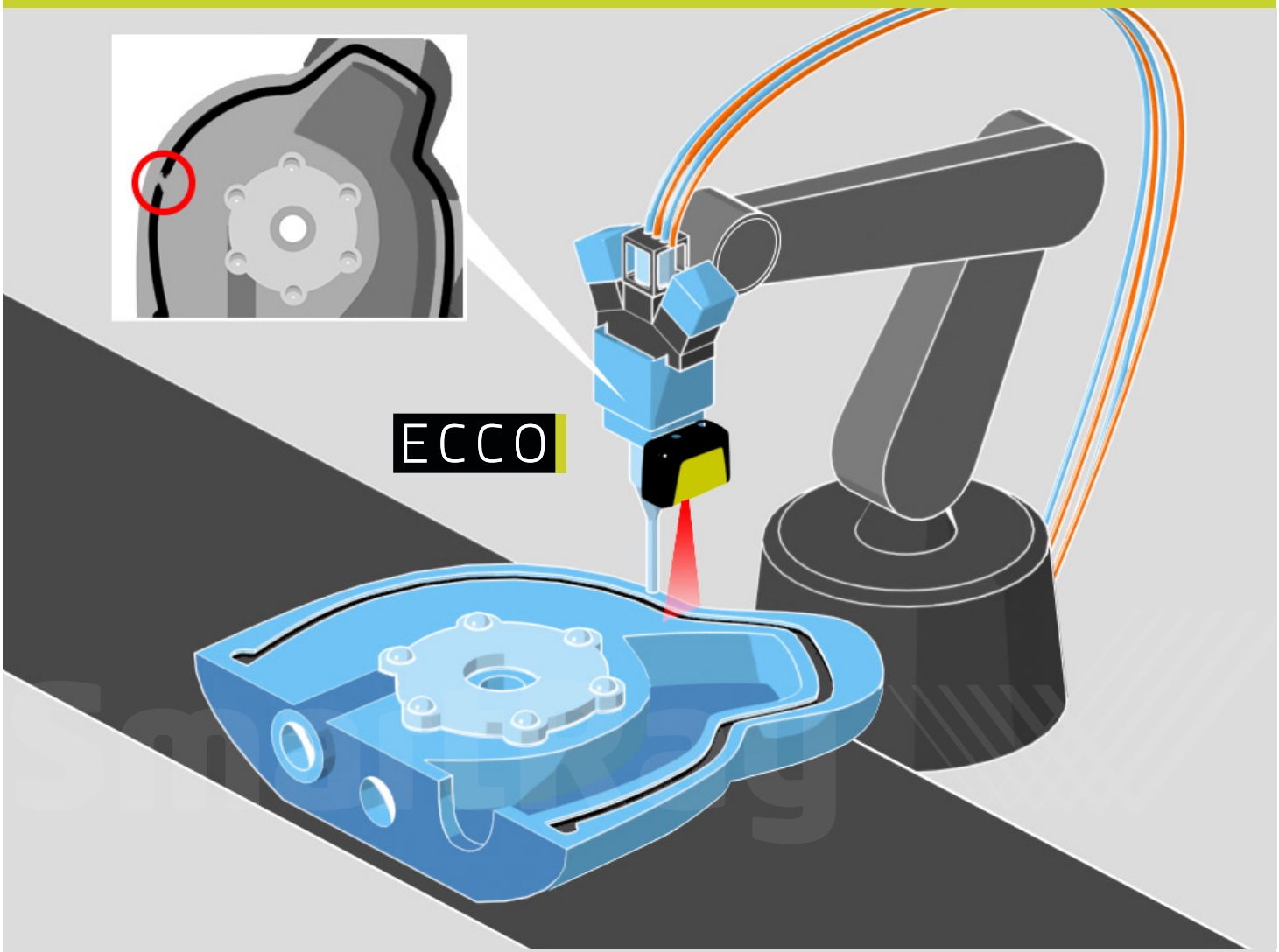
- Measures edge position and checks material thickness
- Operates reliably with transparent and reflective material
- Self contained, compact 3D sensors

### 3D Solution Benefits

- Provides closed loop control of manufacturing process
- Able to operate with any sheet material
- Easily fitted to any production line

SmartRay

# INDUSTRIAL | GUIDANCE




## PUMP – SEALANT BEAD APPLICATION

Applying a bead of sealant to a complex pump housing, prior to the next assembly operation, needs to be carefully controlled. SmartRay 3D accurately guides the robot dispenser around the housing to ensure the correct placement of the sealant around the entire path.

### Why SmartRay 3D?

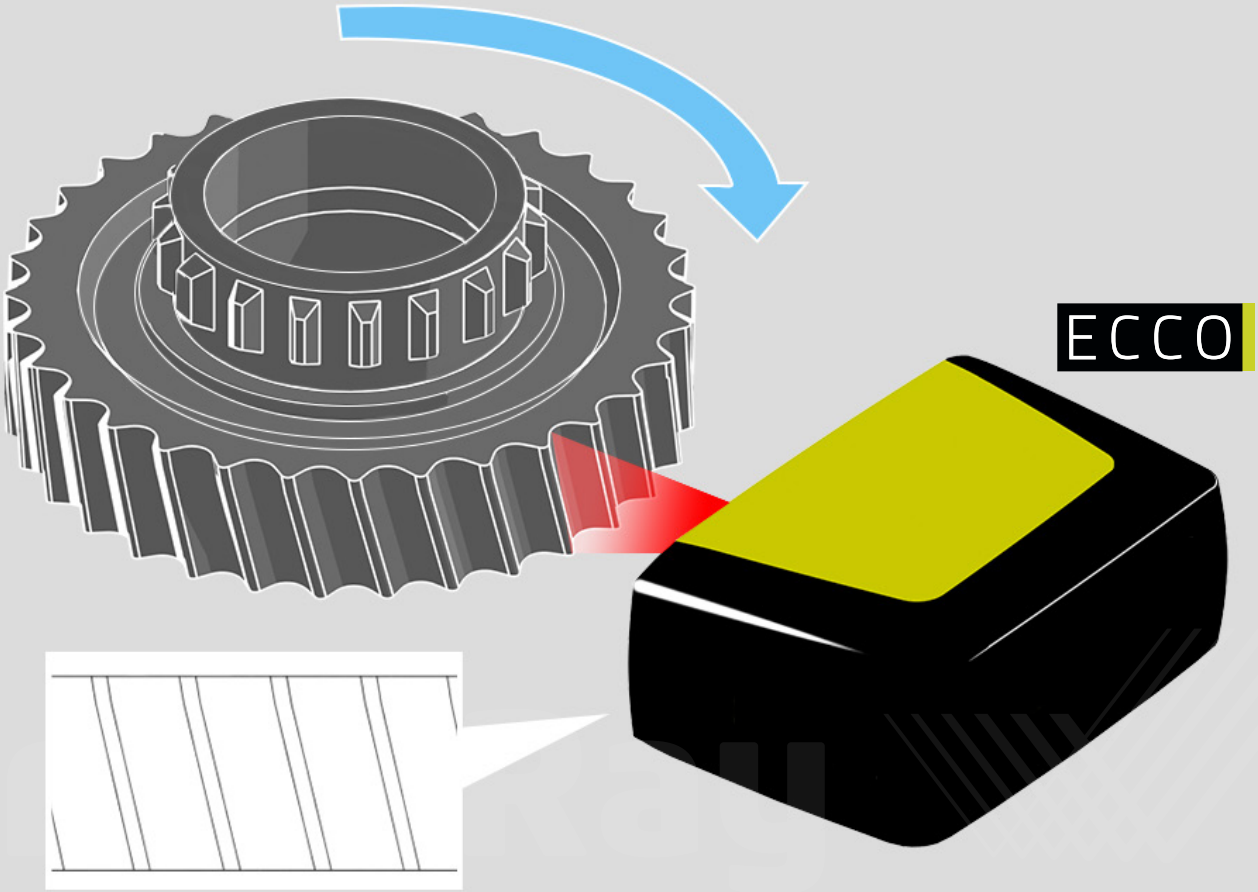
- Guides robot dispenser around the pump seal area
- Monitors profile of sealant bead
- Accomodates variations in pump position

### 3D Solution Benefits

- Complete control of the manufacturing process
- Indicates when reworking required before assembly
- Delivers improved seal integrity

SmartRay

# INDUSTRIAL | MEASUREMENT




## GEAR WHEEL – TOOTH MEASUREMENT

Precision gear wheels used in high performance gearboxes have to be manufactured to very tight tolerances to ensure they operate smoothly and reliably. SmartRay 3D sensors provide the ideal solution for measuring the height and shape of complex gear teeth profiles.

### Why SmartRay 3D?

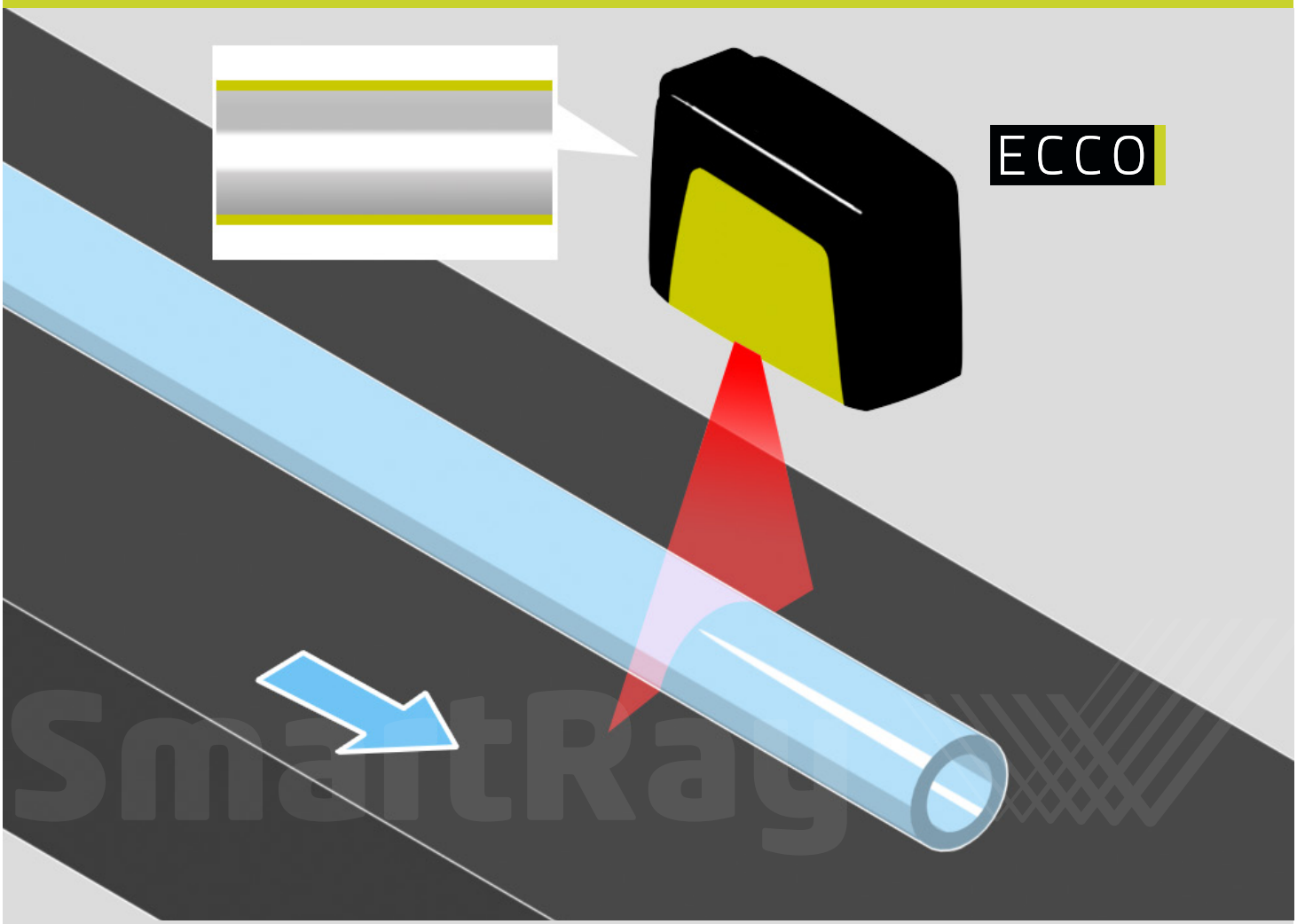
- 360 degree measurement of the entire gear wheel
- High precision measurement of individual gear teeth
- Unaffected by machined surface finish

### 3D Solution Benefits

- Rigorous quality control of machining process
- Ensures all dimensions fall within tolerances
- Flexibile solution for inspecting range of gears

SmartRay

# INDUSTRIAL | MEASUREMENT




## PIPE – STRAIGHTNESS

Stainless steel pipes used in high flow-rate process industries must be manufactured with a controlled level of straightness to avoid unnecessary flow turbulence when in use. SmartRay 3D measures the straightness of long lengths of pipe in all dimensions simultanously.

### Why SmartRay 3D?

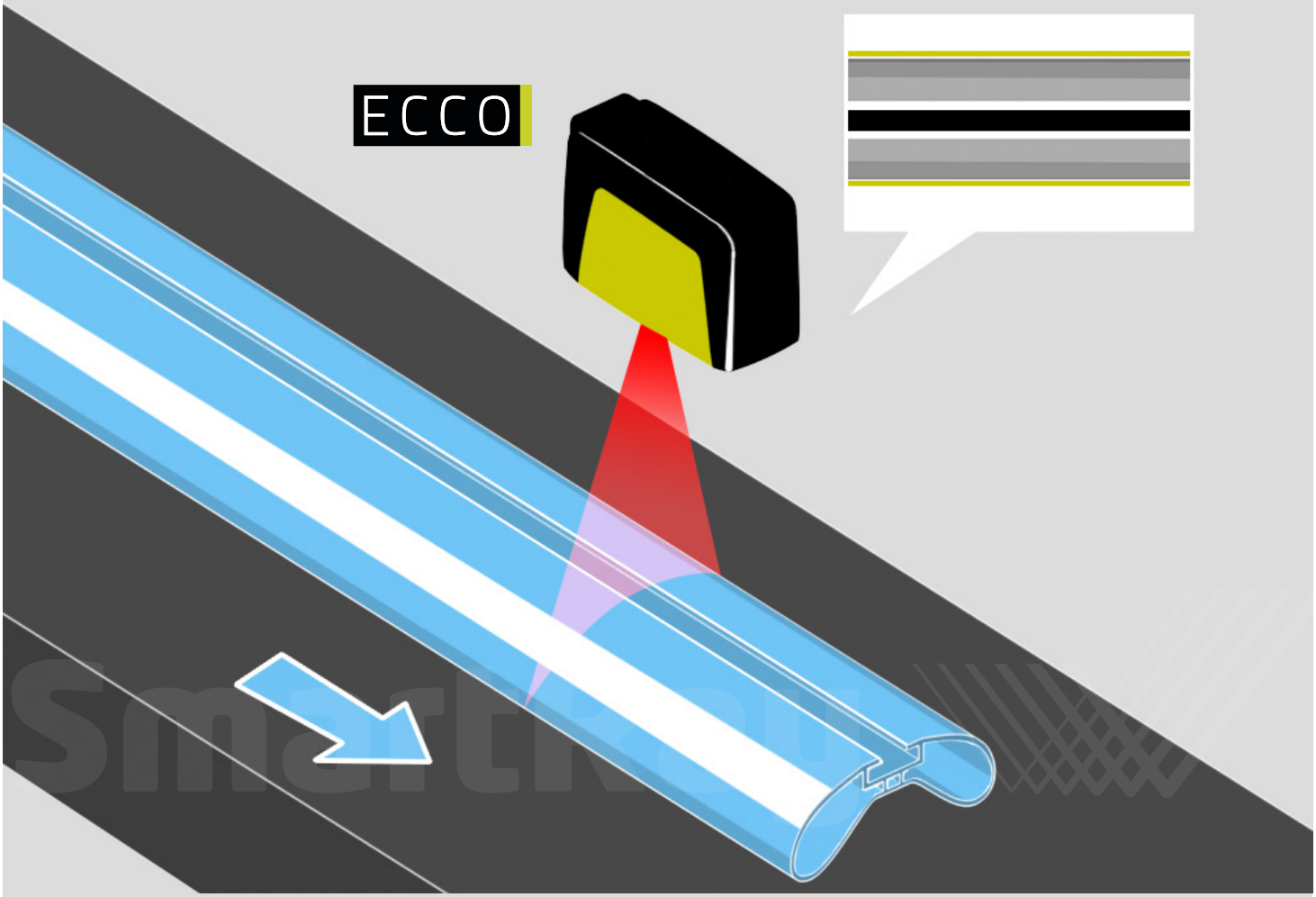
- High precision measurement over entire length of pipe
- Determines straighness of pipe in all directions
- Reflective surfaces do not effect measurement accuracy

### 3D Solution Benefits

- Single sensor measures pipe straighness in all axis
- Rapid, high accuracy scanning process
- Non-contact measurement technique

SmartRay

# INDUSTRIAL | MEASUREMENT




## EXTRUSION – PROFILE GAUGING

There are many factors that effect the dimensional stability of aluminium extrusions as they are being produced. SmartRay 3D measures key dimensions of the extrusion profile as it is being manufactured, to provide real-time feedback to the extrustion machine.

### Why SmartRay 3D?

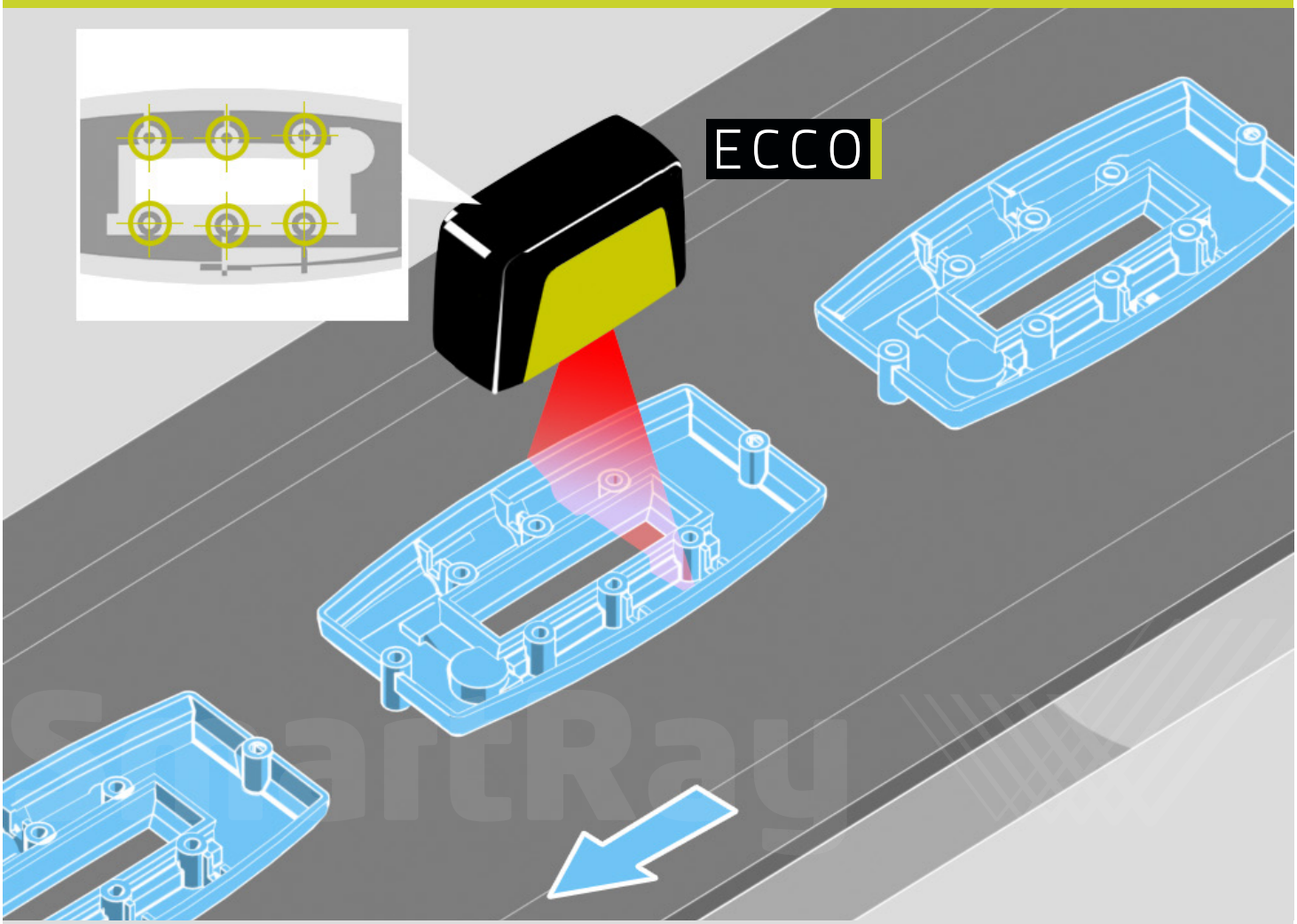
- Real-time profile gauging during extrusion process
- Measures height of grooves and indents within profile
- Self contained, no lighting or lens selection required

### 3D Solution Benefits

- Closed loop control of extrusion process
- Improved profile dimensional consistency
- 3D Sensor easily installed on production line

SmartRay

# INDUSTRIAL | MEASUREMENT




## PLASTIC MOULDING – DEVIATION FROM CAD DATA

Checking that a metal moulding conforms to the original CAD data for the part, can be a challenging process to carry out during manufacturing. SmartRay 3D carries out a complete form and dimensional analysis of each part during the manufacturing process.

### Why SmartRay 3D?

- Measures the location of all surfaces and features
- Detects cracks or other surface deformations
- Precision measurement accuracy

### 3D Solution Benefits

- Carries out complete form and dimensional analysis
- Detects deviation between CAD data and the moulding
- Comprehensive manufacturing quality control

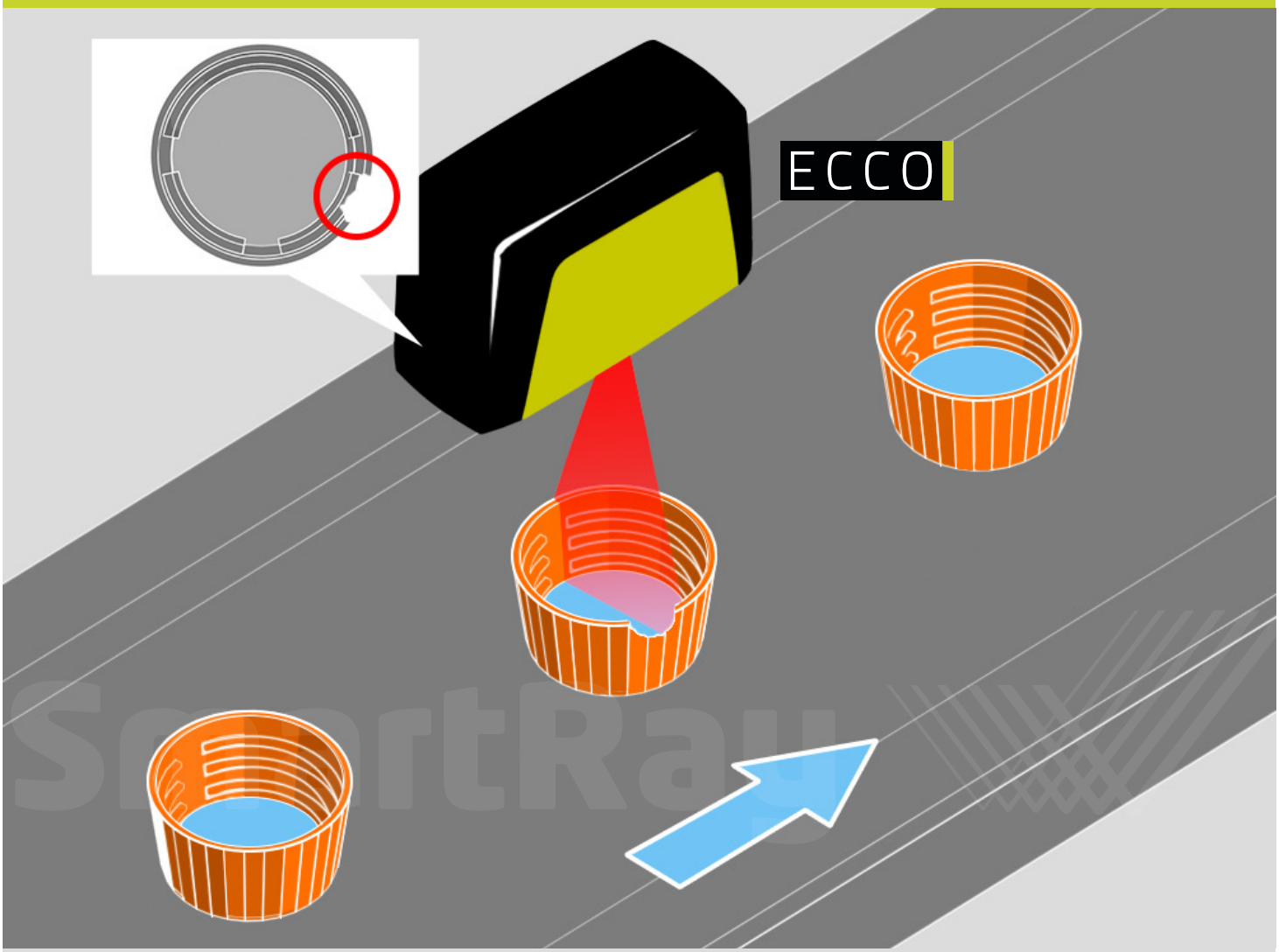
SmartRay

# CONSUMER | APPLICATIONS

**Consumer Products are produced in higher volumes than in any other industry.** Achieving high quality levels, consistent appearance and reliable operation of these products is vital for maintaining customer satisfaction and growing market share. SmartRay 3D Sensors help an ever increasing range of Consumer Product manufacturers improve their manufacturing operations by inspecting their products, measuring critical dimensions and guiding advanced automation that reduces production costs.

SmartRay

# CONSUMER | INSPECTION




## WATER BOTTLE – CAP SHORT SHOT

An incomplete plastic moulded bottle cap can result in a failed seal and leakage from the bottle after manufacture. To avoid negative feedback from retailers and consumers, SmartRay 3D detects incomplete mouldings to ensure faulty parts never reach the filling line.

### Why SmartRay 3D?

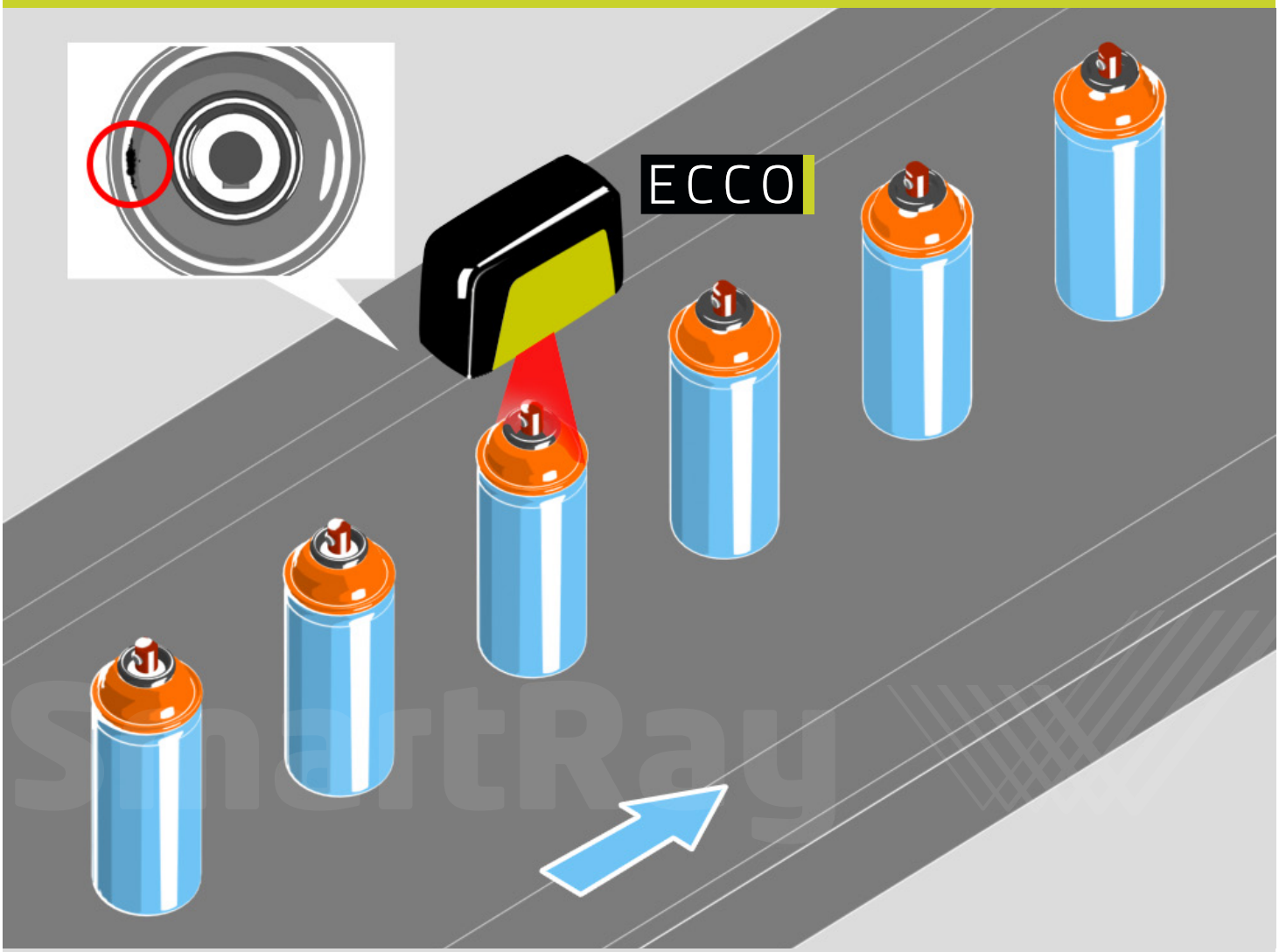
- Checks the entire perimeter of the cap
- Operates reliably with any colour of bottle cap
- Cost effective inspection solution

### 3D Solution Benefits

- Prevents bottle leaks after filling and capping
- Improves production efficiency
- 3D sensor can be fitted to existing production line

SmartRay

# CONSUMER | INSPECTION




## AEROSOL CAN – DAMAGE AFTER FILLING

If the top of an aerosol can is damaged during the filling process there is a danger of leakage and it may be impossible to fit the cap to the can. SmartRay 3D is able to check the shape and profile of the top of the can to detect any damage that may have occurred.

### Why SmartRay 3D?

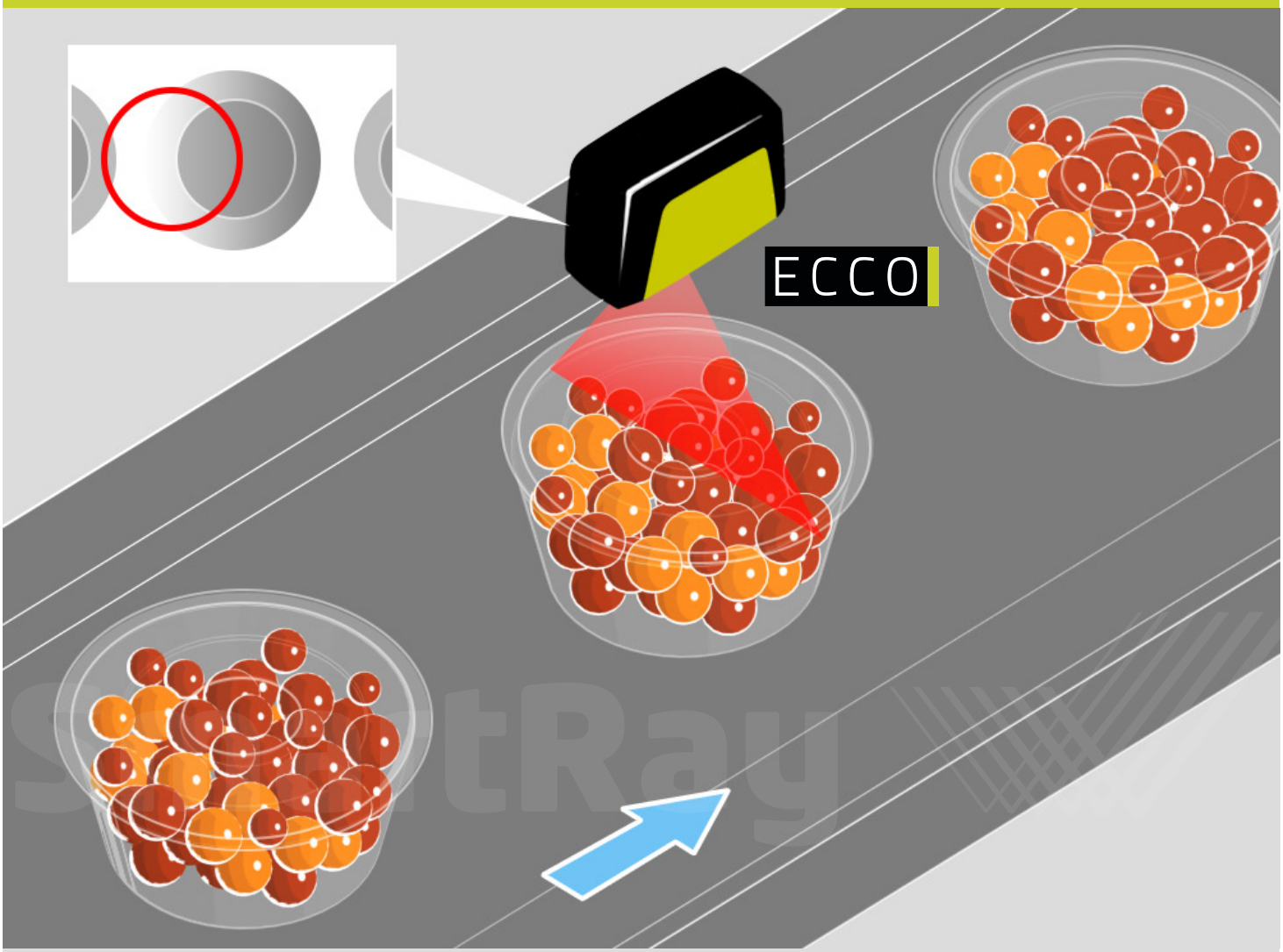
- Identifies damage to the top of the can
- Detects distortion and unexpected height variations
- IP65 rated 3D sensor housing

### 3D Solution Benefits

- Minimises risk of leakage
- Makes sure that cap will fit to can correctly
- Ensures can will operate correctly after purchases

SmartRay

# CONSUMER | INSPECTION




## FOOD CONTAINER – LID SEATING

For perishable foods, it is particularly important that the packaging is airtight and correctly sealed. SmartRay 3D sensors check the height of food lid, to ensure that they are fully seated onto the food container, 360 degrees around the edge.

### Why SmartRay 3D?

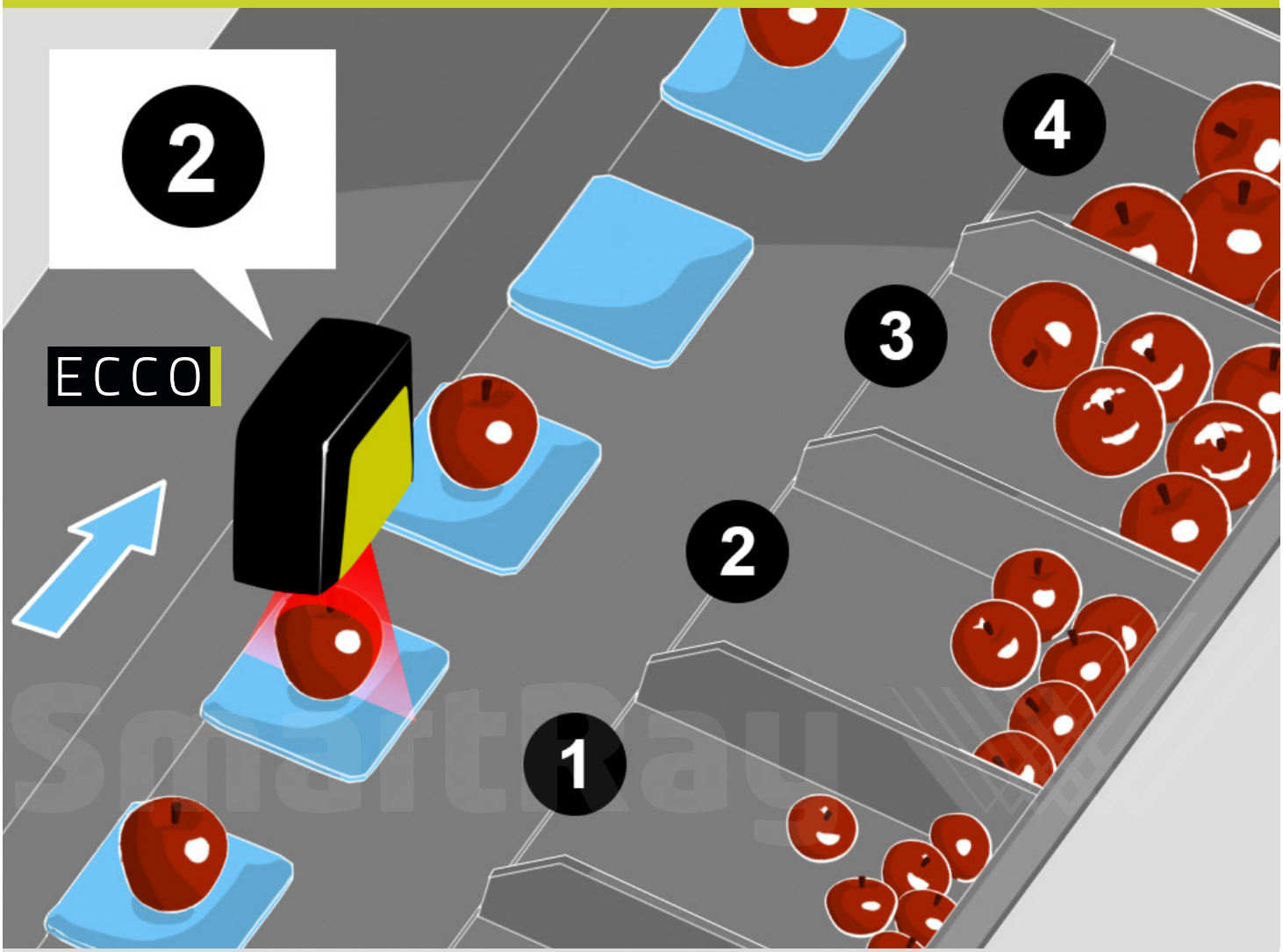
- Verifies the height of the entire edge of the lid
- Identifies any misalignment or damage to the lid
- 3D sensor has IP65 rated housing

### 3D Solution Benefits

- Identifies containers with possible incomplete seal
- Isolates faulty containers
- Avoids expensive product recalls

SmartRay

# CONSUMER | INSPECTION




## FRUIT – SHAPE AND SIZE SORTING

Supermarkets like to present fruit to their customers in consistent sizes and regular shapes. SmartRay sensors can build a 3 dimensional model of any object, so that it's size, shape and volume can be calculated. This data is used to control the automatic fruit sorting system.

### Why SmartRay 3D?

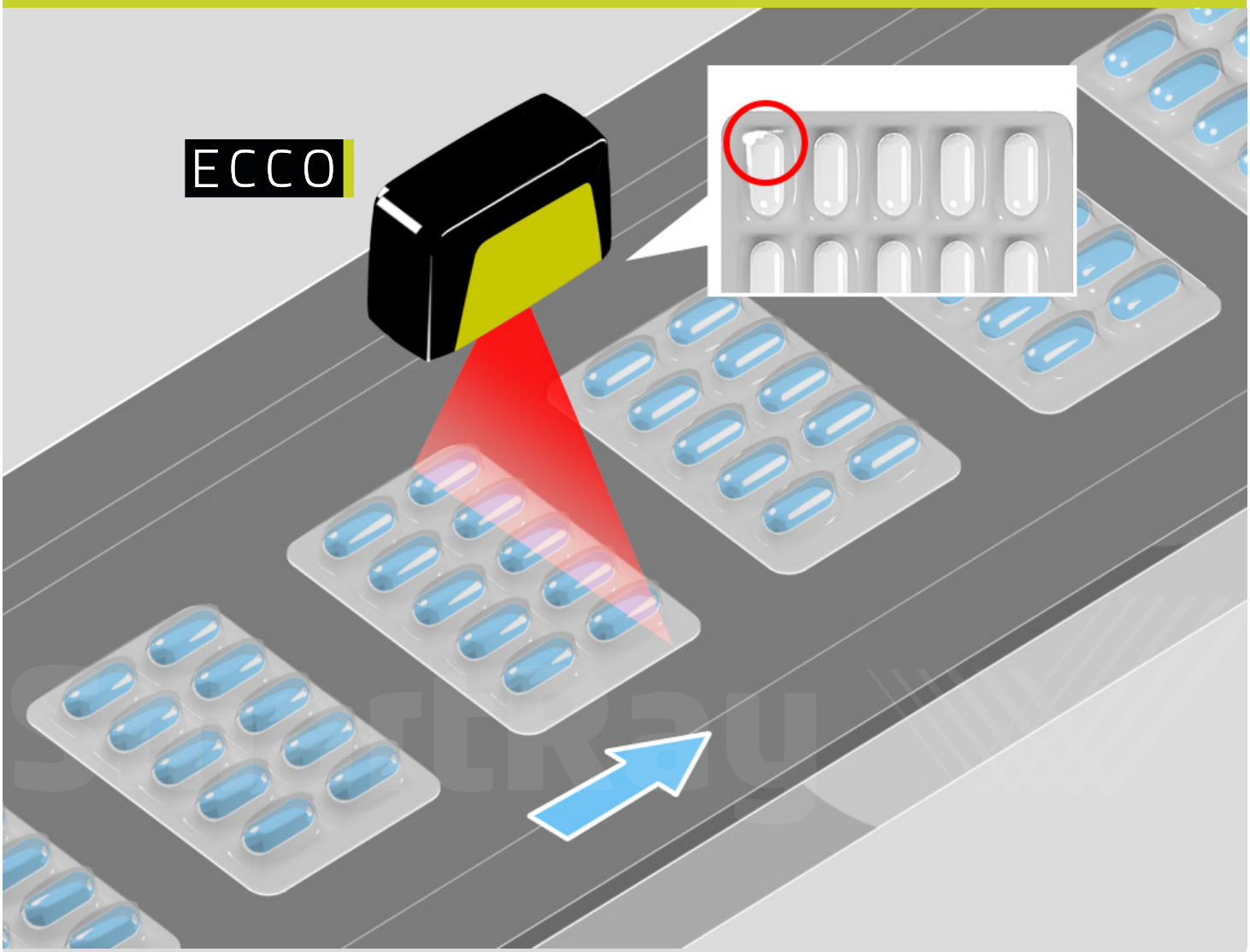
- High speed non-contact categorisation process
- Unaffected by fruit colour or appearance
- IP65 rated 3D sensor housing

### 3D Solution Benefits

- Fully automatic process replaces manual sorting
- Flexible solution for range of different fruits
- Satisfied customers at point of purchase

SmartRay

# CONSUMER | INSPECTION




## BLISTER PACK – DAMAGED CONTENTS

It sometimes happens during the blister pack filling process that the content can get damaged or trapped in the packaging. SmartRay 3D checks that all pockets in the blister pack are filled, that the contents are undamaged and that there is no deformation in the packaging.

### Why SmartRay 3D?

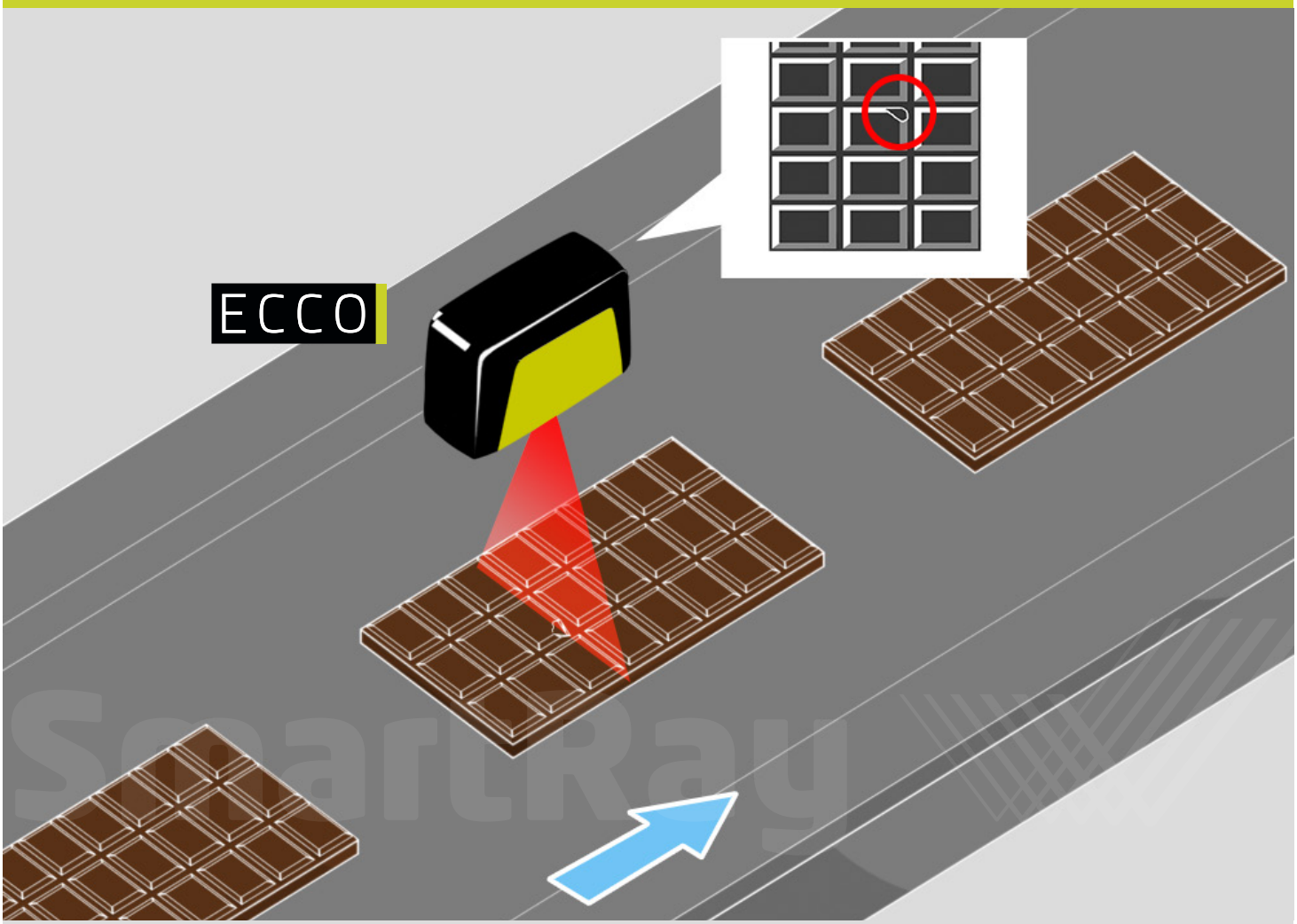
- Checks contents of each blister pocket
- Identifies damaged content
- Detects deformations in the packaging

### 3D Solution Benefits

- Continous monitoring of the packaging process
- Faulty packages are immediately detected
- Helps eliminate customer complaints

SmartRay

# CONSUMER | INSPECTION




## CHOCOLATE BAR – DAMAGE AND INCOMPLETE

Taking a chocolate bar out of it's wrapper and discovering that part of it is missing is frustrating for the consumer and bad for the manufacturer's reputation. SmartRay 3D checks that chocolate bars are fully formed, undamaged and ready to be packaged.

### Why SmartRay 3D?

- Detects both missing pieces and damaged surfaces
- High speed operation for typical production lines
- No heat generated by 3D sensor or laser light

### 3D Solution Benefits

- Eliminates defective product reaching consumers
- Identifies issues as soon as they occur
- Increases customer repeat purchase levels

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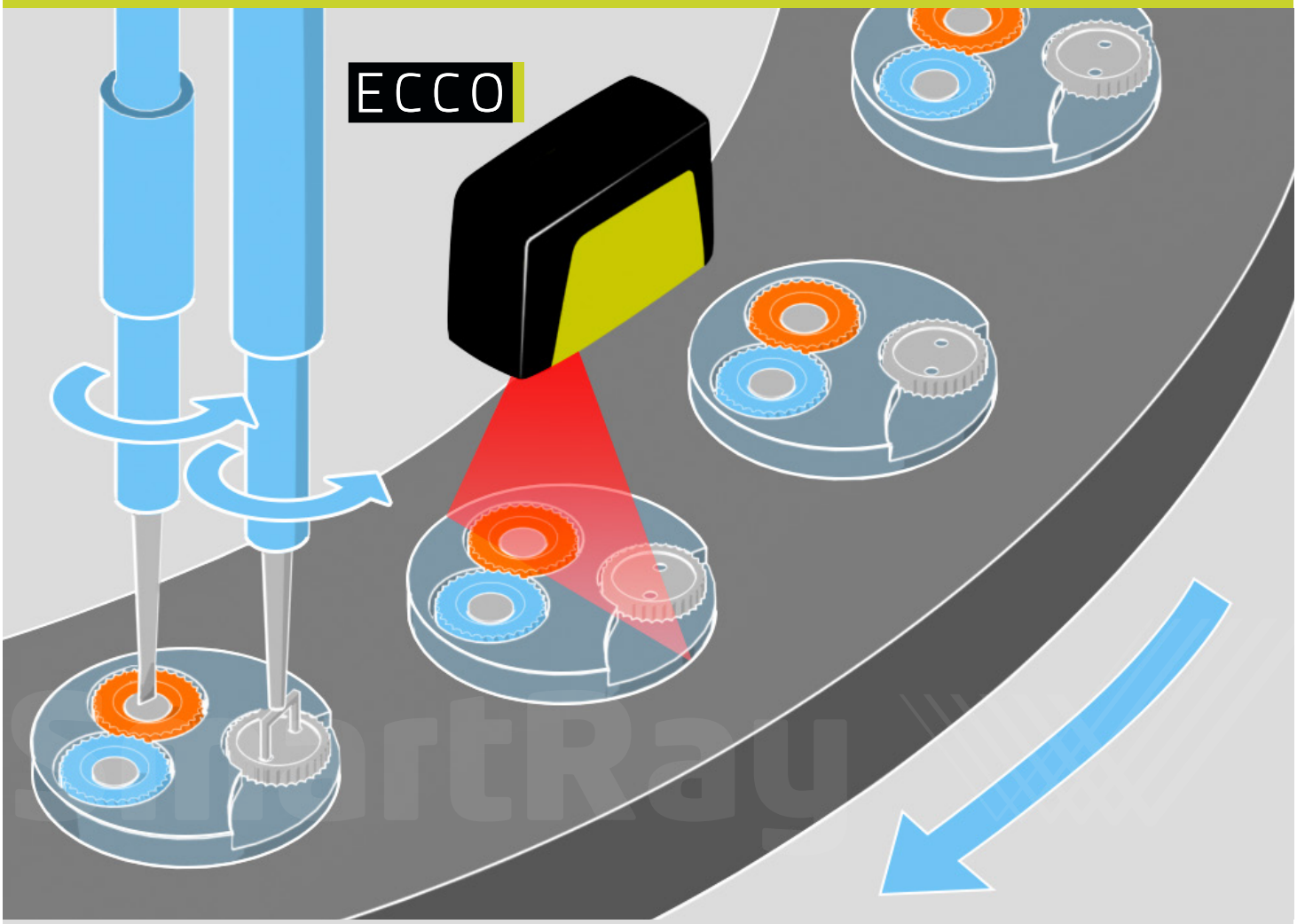
# CONSUMER | GUIDANCE




## WATCH – MECHANICAL CALIBRATION

Mechanical watches require careful assembly of delicate components and precise calibration of the final product to ensure accurate time keeping. SmartRay 3D inspects the position of key components in all dimensions and guides the mechanisms that control the calibration.

### Why SmartRay 3D?

- Accurate 3D positioning of miniature components
- Precision guidance for mechanical adjustment
- Compact 3D sensors that can fit in small space

### 3D Solution Benefits

- Guidance and inspection for assembly automation
- Complements existing production processes
- Improved time keeping and product reliability

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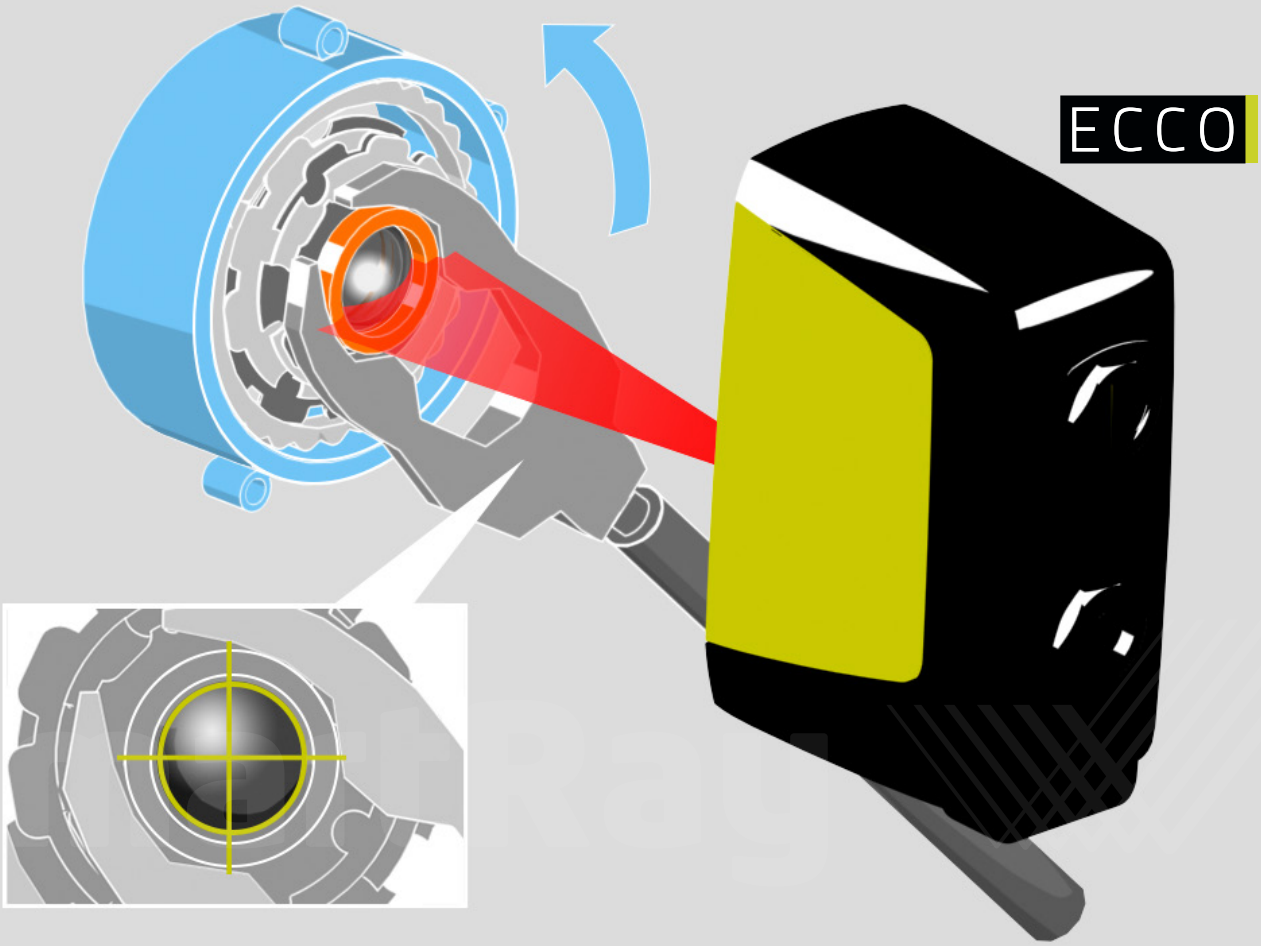
# CONSUMER | GUIDANCE




## CAMERA – OPTICAL ADJUSTMENT

The latest digital cameras contain tiny optical components that require accurate and repeatable assembly. SmartRay 3D sensors help monitor and control the final adjustments to the positions of these key components during the manufacturing process.

### Why SmartRay 3D?

- Guides components in 3D during assembly process
- Precision adjustment of component positioning
- Various working distance 3D sensor models available

### 3D Solution Benefits

- Total control of the assembly process
- Detailed 3D feedback during manufacture
- Enhances camera brand reputation

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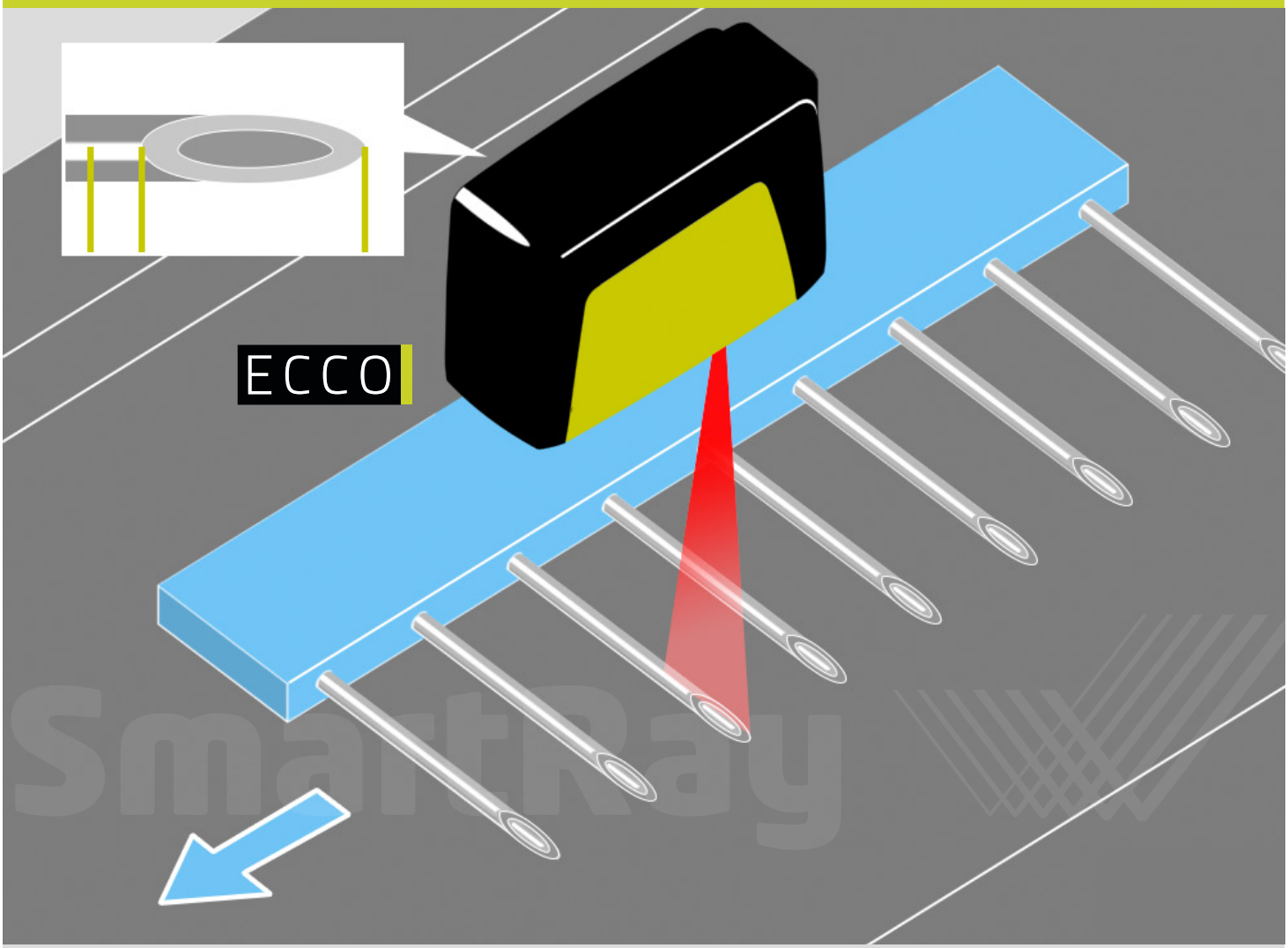
# CONSUMER | MEASUREMENT




## SYRINGE NEEDLE – SHAPE AND DIMENSIONS

To satisfy the world market for medical treatments, syringe needles are manufactured at high speed in very large volumes. To ensure that each and every needle tip is sharp and correctly formed SmartRay 3D sensors measure their shape and dimensions on the production line.

### Why SmartRay 3D?

- High speed, high-accuracy measurement of needle tip
- Detects damaged or deformed needle tips
- Non-contact inspection and quality control solution

### 3D Solution Benefits

- Meets demanding pharmaceutical standards
- Delivers consistent, high quality product
- Enhances reputation in medical profession

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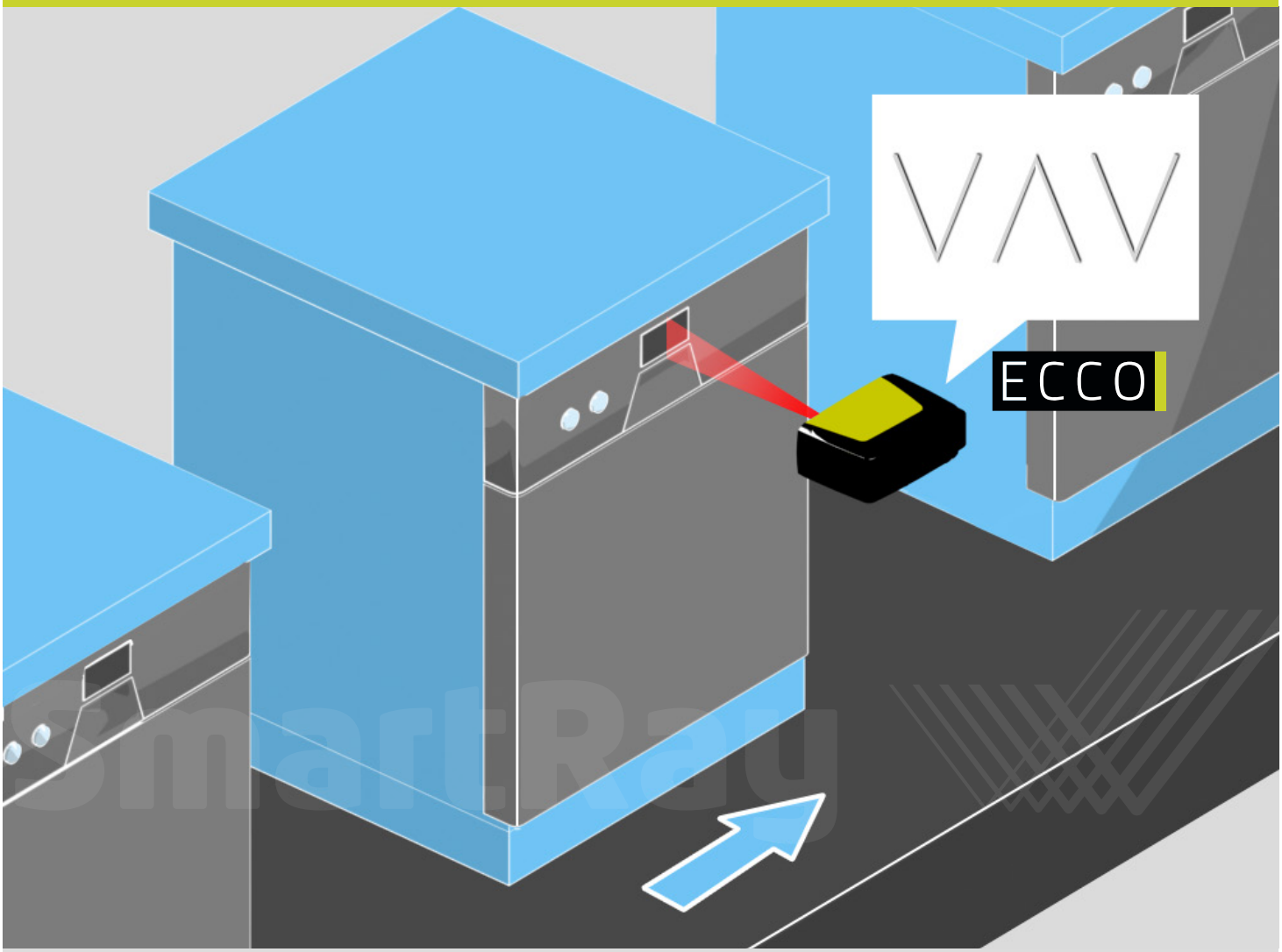
# CONSUMER | MEASUREMENT




## DISH WASHER – LASER ENGRAVING

Modern white good brands are differenting themselves with curved shapes instead of the traditional white boxes. Inspecting logos created by laser engraving on curved surfaces is impossible with 2D vision systems. SmartRay 3D sensors check the engraving shape and depth.

### Why SmartRay 3D?

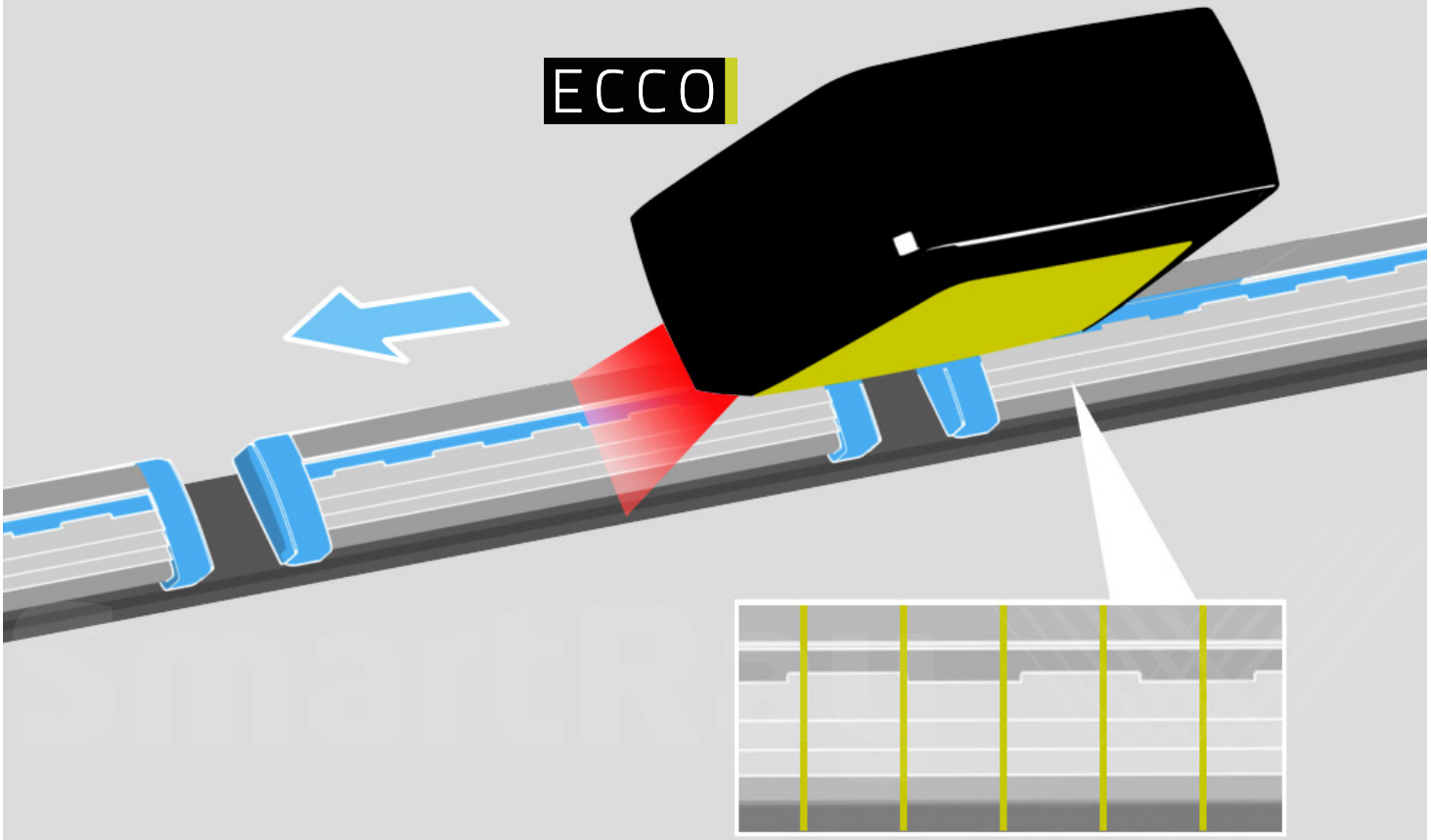
- Accurate measurement of engraving depth and shape
- Unaffected by complex curved surfaces
- Pre-calibrated sensor for rapid deployment

### 3D Solution Benefits

- Rapid feedback to laser marking system
- Low cost, off the shelf sensing solution
- High quality product finish

SmartRay

# CONSUMER | MEASUREMENT




## RAZOR – BLADE ALIGNMENT

Multi-blade razor cartidges have become complex assemblies that have to be very accurately assembled to ensure the best possible shaving experience. SmartRay 3D checks the height, spacing and angle of all the blades in each cartridge to ensure total product consistency.

### Why SmartRay 3D?

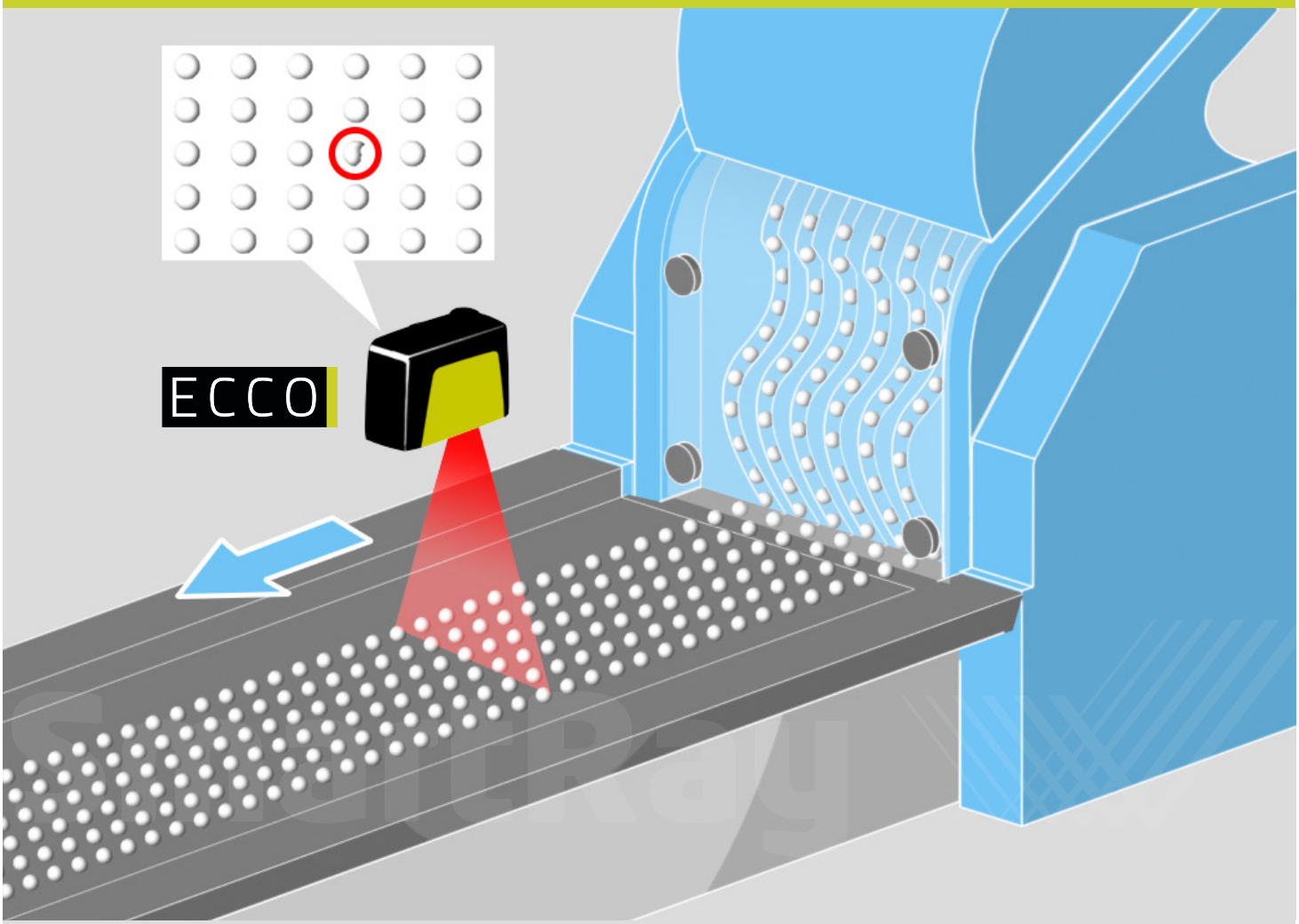
- Checks height, spacing and angle of bladess
- High accuracy in all directions
- No calibration required

### 3D Solution Benefits

- Eliminates assembly defects
- Improved process control
- Consistent shaving performance

SmartRay

# CONSUMER | MEASUREMENT




## PHARMA TABLET – VOLUME

Checking the size and shape of individual pharmaceutical tablets is important to ensure the correct dosage is given to patients every time. SmartRay 3D measures the volume of tablets and detects any surface damage or cracking that may have occurred.

### Why SmartRay 3D?

- Delivers accurate 3 dimensional measurement
- Operates consistently with any colour of tablet
- Detects missing parts and surfact damage

### 3D Solution Benefits

- Accurate control of the manufacturing process
- Rapid feedback if damage is occuring to tablets
- Improved reputation with medical dispenaries

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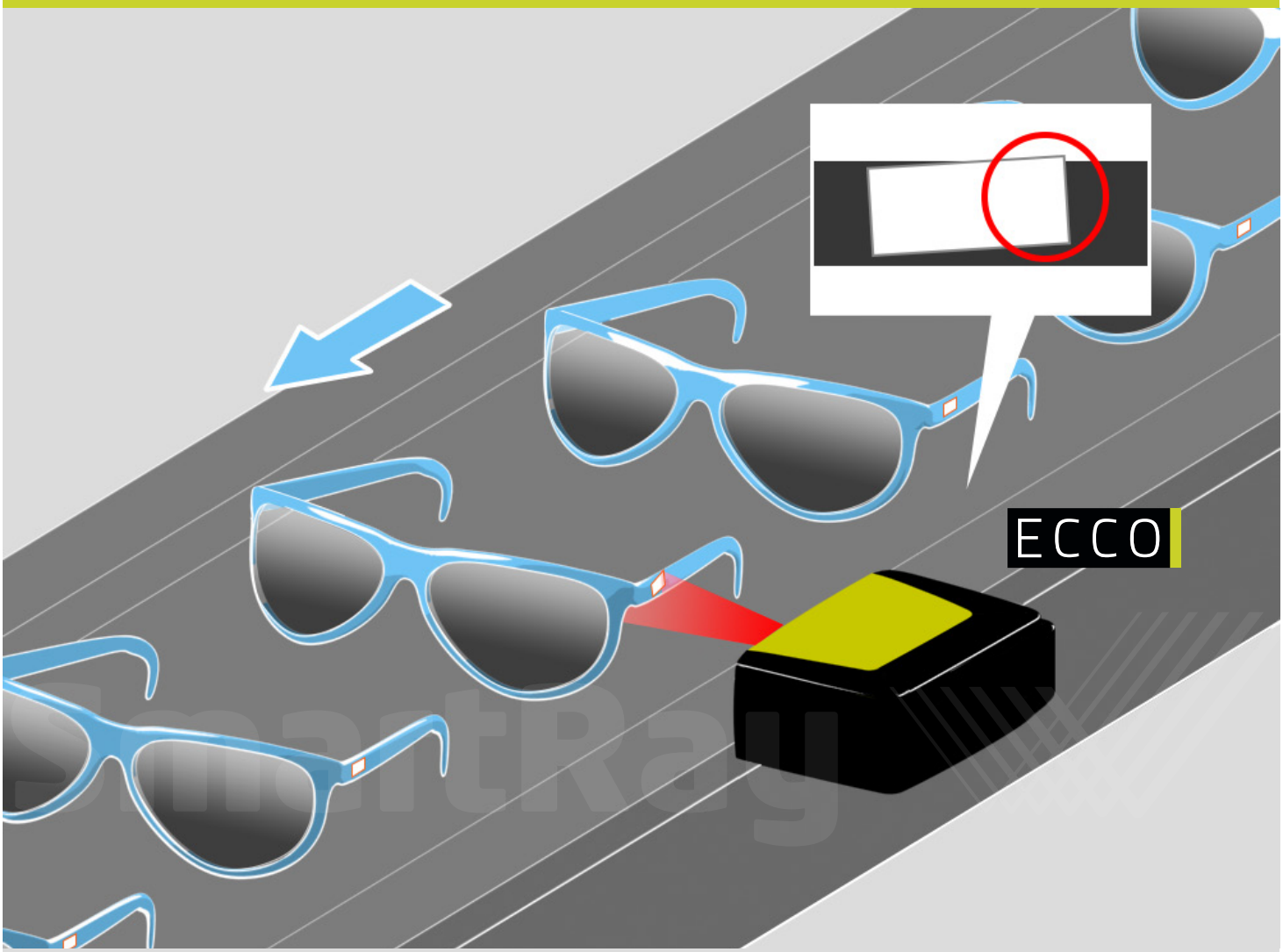
# CONSUMER | MEASUREMENT




## DESIGNER GLASSES – BRAND LABEL POSITION

For many people brand labels on glasses are very important, so it is vital that they are correctly attached every time. SmartRay 3D identifies the exact location of the glasses, checks the application of the glue and then measures the final position of the labels.

### Why SmartRay 3D?

- Identifies position of glasses during labeling process
- Checks glue coverage and depth
- Confirms correct positioning of label on glasses

### 3D Solution Benefits

- Repeatable and accurate assembly process
- High level of customer satisfaction
- Premium brand reputation maintained

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# FOR MORE INFORMATION PLEASE CONTACT US:

**SmartRay GmbH**
Bürgermeister-Finsterwalder-Ring 12
82515 Wolfratshausen
GERMANY

**P + 49 (0) 8171 9683 400**
**info@smartray.de**
**www.smartray.de**