

## CERAMIC BALL CHECK SYSTEM – CBCS

Fully automated quality check of surface and roundness of ceramic bearing balls



## CeDeD CENTER OF DEVICE DEVELOPEMENT



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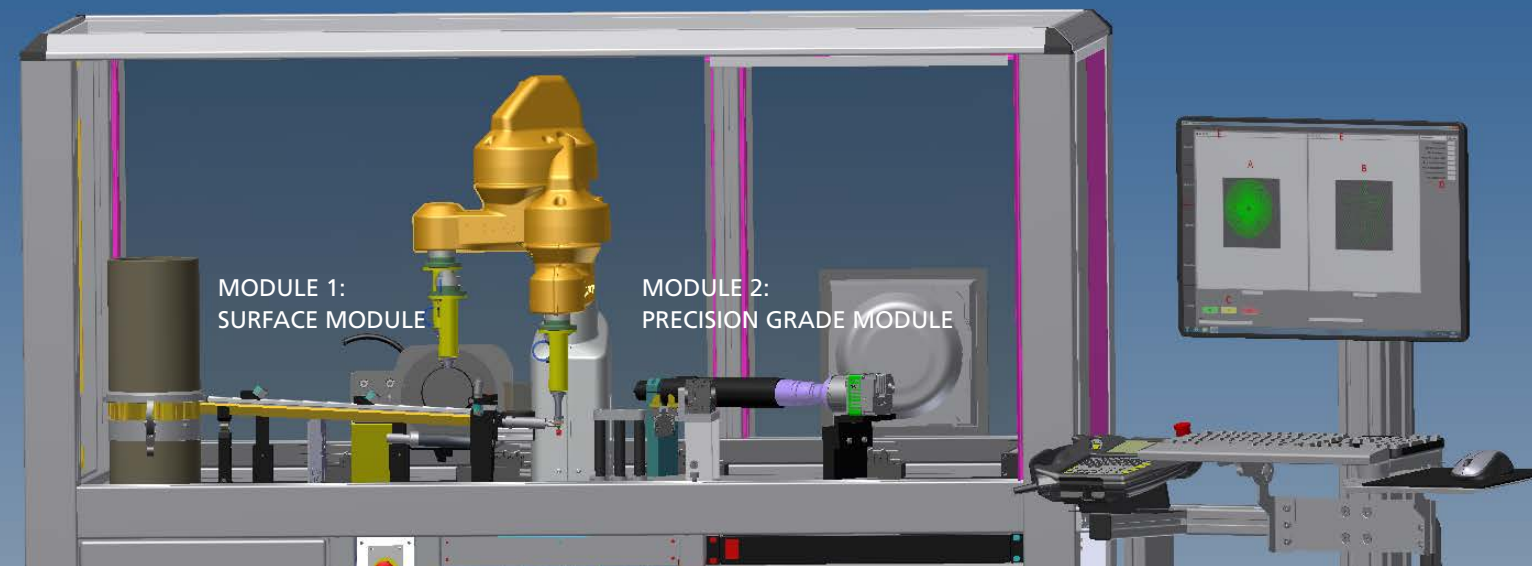


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## CBCS – CERAMIC BALL CHECK SYSTEM

The ceramic ball check system CBCS is designed to check the quality of surface and roundness of ceramic bearing balls with highest accuracy and fully automated. The most common material of ceramic bearing balls used is silicon nitride. Balls made from this material are hard, up to Rc78, and have a very smooth surface. Because of their hardness, corrosion and heat resistance, such bearing balls are well applicable in harsh environment as sea water application or steam turbines. To ensure the reliability of such bearing balls a quality check of surface smoothness and absolute roundness is essential.

The CBCS proves the zero defect production and smoothness of the surface (no cracks, scratches and flakes) of the ceramic balls and the accuracy of roundness according the precision grades listed in JIS B 1501.

The CBCS is designed to check ceramic balls with dimensions from 1/8" (3.175 mm) to 3/8" (9.525 mm) and is able to determine the precision grade up to G3.

To detect surface defects and precision grade of ceramic ball, two separated modules are used.

### MODULE 1: SURFACE MODULE

- Camera inspection with high resolution
- Special illumination to detect all kinds of defects
- Software package to analyse spheres

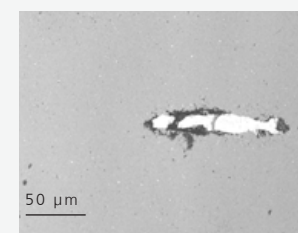
### MODULE 2: PRECISION GRADE MODULE

- Camera inspection with high resolution up to 0.8  $\mu\text{m}$
- Precision Grade up to G3 -> +/- 5  $\mu\text{m}$  limit
- Software package to analyse spheres

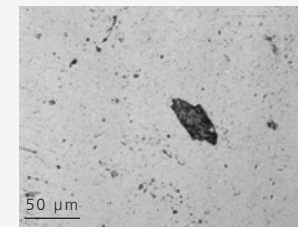
## DIFFERENT MODULES

### MODULE 1: SURFACE MODULE – SURFACE DEFECTS

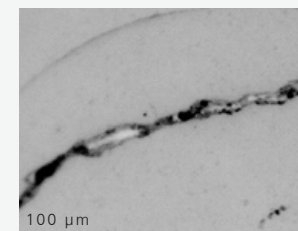
- dimension: 1/8" – 3/8" (3.175 mm – 9.525 mm)
- resolution: 2  $\mu\text{m}$  -> 0.8  $\mu\text{m}$  (pixel interlacing)
- 100% surface check (adjustable)
- automated ball guiding
- check time: 3 – 10s (adjustable)
- assignable defects: cracks, scratches, flakes



Defect 1 - Scratch

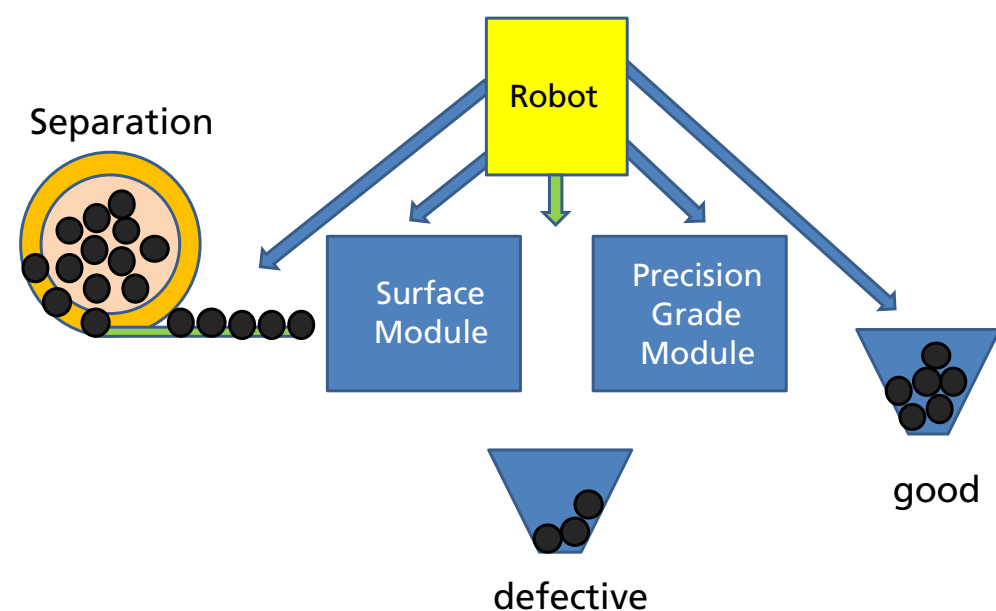


Defect 2 - Flakes



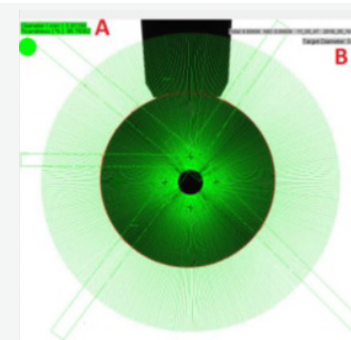
Defect 3 - Cracks

## PRINCIPLE

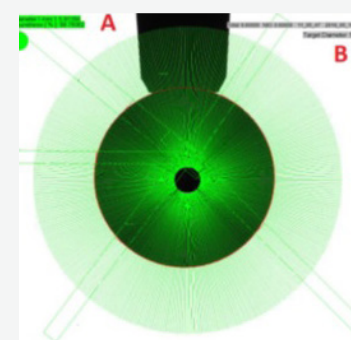


### MODULE 2: PRECISION GRADE MODULE – SHAPE DEVIATION

- dimension: 1/8" – 3/8" (3.175 mm – 9.525 mm)
- resolution: 2  $\mu\text{m}$  -> 0.8  $\mu\text{m}$  (pixel interlacing)
- up to 10 position check – full ball check (adjustable)
- automated ball guiding
- check time: 3 – 10s (adjustable)
- assignable precision grades: G3, G5, G10



View 1



View 1 rotated 90 degrees