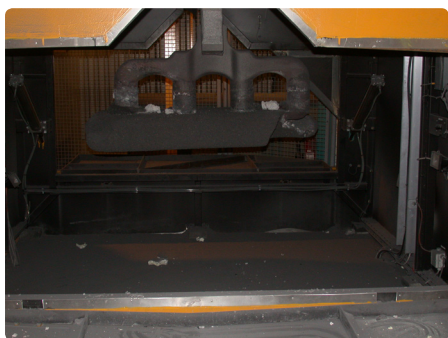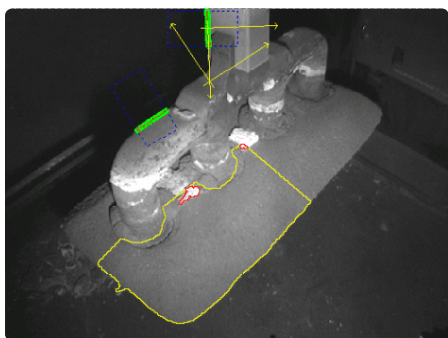# Bath Detection Vision System Aluminium Smelter

The system performs an automatic bath detection of cleaned butts to confirm adequate cleaning.

The upper and side surfaces of the butts are checked to determine the cleanliness based on the percentage of surface area which is white.

Butt with bath seen as white areas

The white areas here identified with red borders are not properly cleaned.

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System description

The Bath Detection Vision System cabinet is equipped with 4 cameras to avoid rotation of the anode. The butt is stopped within the cabinet and images captured from all 4 cameras within 5 seconds after the butt is brought to a stop.

Each butt is checked for bath on the upper and partly the side surface. The size of bath and the percentage of bath are calculated. By using two cameras angled 45 degrees down towards the butt, the upper and all side surfaces are covered during a 180 degrees rotation.

Light areas are detected in the image analysis. In each image the cameras have a region of interest of approximately 1200 x 750 mm. Thus white areas of 50 mm2 are detected.

Limit values are easily adjusted in a graphical screen image.

Measured Values

- Area of coal in mm2
- White area (bath area) in mm2
- Largest white area (bath area) in mm2
- White area in percentage %

Technical Data

Equipment: 19" cabinet IP56 and cooling device, Industrial Computer, Color Touch Screen, Scorpion Vision Software, Four digital cameras, Four halogen lamps, Devicenet interface, Ethernet connection for remote control

Cabinet dimension: The interior dimension of the enclosure is: width=2000 mm, length=1500 mm and height = 2400 mm

Measurement cycle time: 15 sec

Classification

based on the measured values, the system classifies each butt in one of the following states:

- **Pass**, all measurement values within range
- **Fail**, one or more measurement values out of range
- **Cannot Measure**, system out of calibration or image processing failure
- **System Failure**, lighting or camera failure

Results

The system displays the following information on screen, for each butt:

- The classification state
- The measured values

In addition the system has the following features:

- Real time presentation of camera images with fault indication
- Curves for all measured parameters
- Pareto, a pareto distribution is available for the classification states
- A classification counter

For all vision tasks, the software of choice is Scorpion Vision Software®. Scorpion is an independent, configurable and open software tool for industrial vision. It is ideal for increased automation and improved quality in production output.

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