



QSO Interferometer Systems AB

QISAB

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PROGRESS BY PHYSICS

CWS – Measurement system for in-line surface quality inspection

CWS - Coherent Wave Scatter System, a robust laser system for measurement of surface quality parameters in the nanometer range, suitable for in-line manufacturing processes.

The QISAB CWS (Coherent Wave Scattermeter) measurement system is based on the coherent and incoherent laser light scattering. The technique measures areas up to 100mm²/sec depending on the laser spot size and surface standard deviation (Sq) in the range of 0.010 – 0.350 μm. The measurement system is robust and therefore ideal suitable for automated in-line processes e.g. by integration into tool changing systems of robots.

The CWS makes it possible to scan the entire object quickly, in line within the production cell and to obtain information about the surface quality with corresponding positioning to the CAD data. The information consist of both statistical values for gloss and waviness as well as the detection of structures and their direction. This information is used as a feedback mandatory for automated manufacturing processes and are part of a more objective quality assurance. The detected data for surface roughness (Sq), gloss, symmetry, and structure (Str) correlates in relation to the surface texture with ISO 25178, part of the international standard GPS (Geometrical Product Specification).

CWS applications and significances

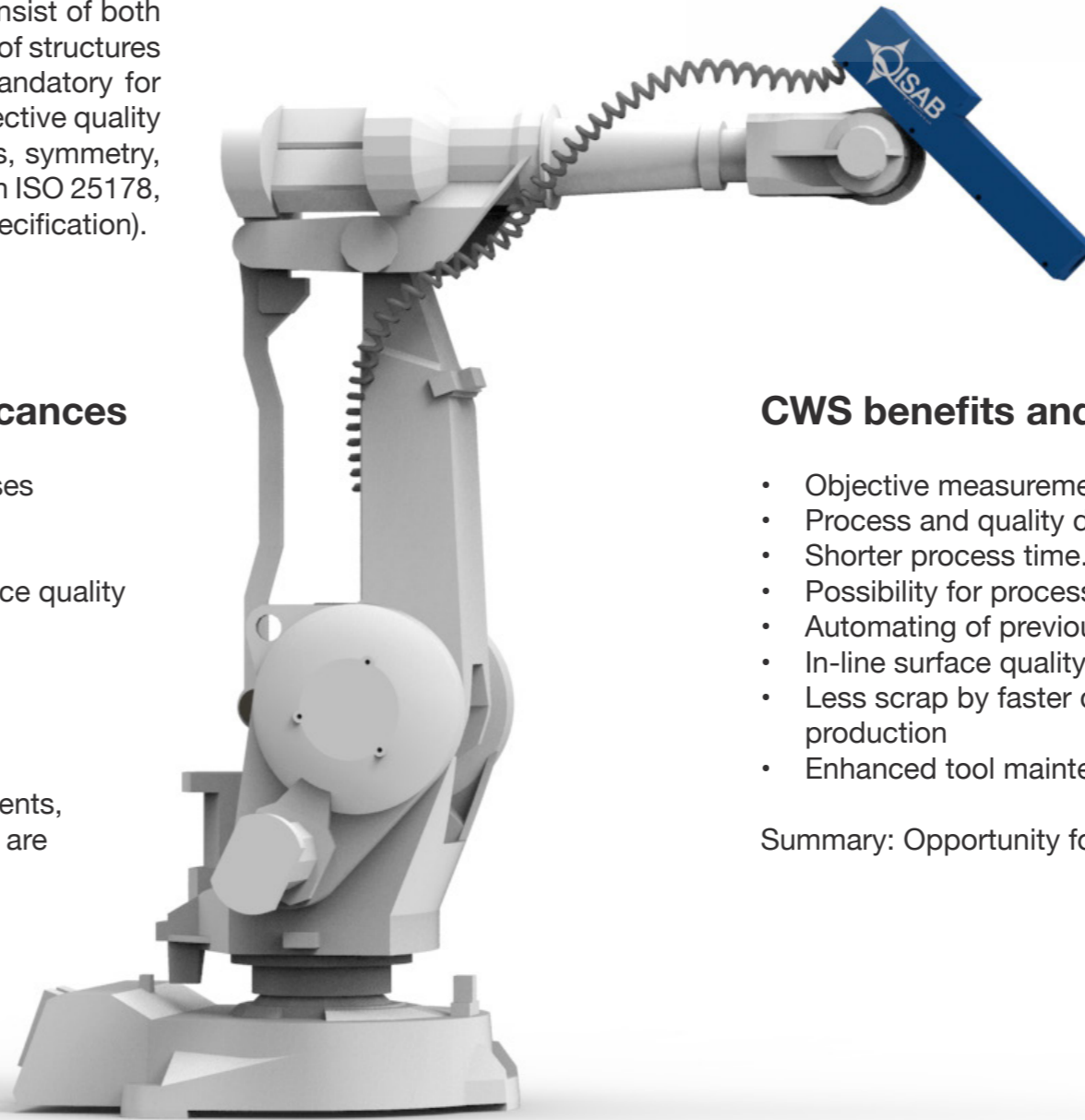
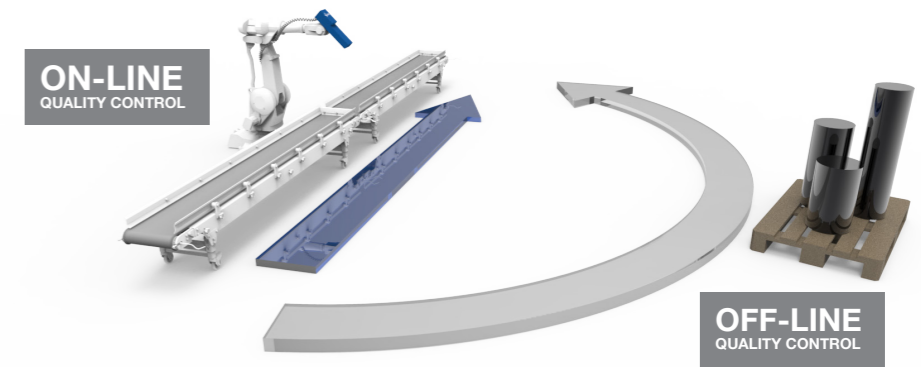
- Suitable for automated in-line processes
- Robust system
- Fast measurement
- Easy determine and follow up of surface quality
- Replaces manual inspections
- Non-contact measurement
- Areal surface measurement
- Independent on surface orientation

Summary: Wherever objective measurements, control and parameters of surface quality are required

The benefit

The main idea is basic and fundamental.

Robot assisted on-line control. By using an automatic on-line quality checkpoint the flow of the production are improved, and no samples has to be off the line. In addition, it is possible to maximize the amount of measured samples to verify the expected quality of the surface and material.



CWS benefits and added values

- Objective measurements
- Process and quality documentation
- Shorter process time.
- Possibility for process optimizations
- Automating of previous manual process
- In-line surface quality control
- Less scrap by faster detecting quality problems close to production
- Enhanced tool maintenance and replacement scheduling

Summary: Opportunity for significant total cost savings

CWS Technical Specification

Laser diode	640 nm @ 0,1 – 10,0 mW
Power requirement	10 W
SW platform	MS Windows
Electrical	110 – 240 VAC
Instrument rms resolution	Sq 10 – 350 nm
Depth of field	1 mm
Required positioning acc.	< 1 mm
Measurement area	≥ 4x4 mm
Measuring time	1 ms
Analysis time	<0.2
x, y resolution	2048x2048 pixels
x, y sensitivity	2 μm
Working distance	70 mm
Temperature range	-10 – +50°C
Weight sensor	< 2 kg
Dimensions sensor	300x100x50 mm
Control	Active X
Data output	Active X or to SQL database
Communication	-PC / back-end -Sensor / back-end
	GigE Ethernet, USB, max 1000 m Robot tube: 24 VDC, GigE E., optical fiber, max 100 m

