

## HELIOS

A different lighting for visual inspection (VT)

**HELIOS (HEMIspherical Light Oriented Sensor) is a true revolution in the way to perform and interpret industrial TV inspections**

### Challenge

TV inspections currently realized exhibit limits regarding their capacity to characterize indications. The idea of this innovation is to provide to the visual inspection the multi-elements dimension that will allow a better appreciation of the inspected surface as in the case of ultrasonic or magnetic inspections.

### Working Principle

HELIOS drastically improves TV inspections, offering a tool for interpretation and analysis of images according to different illumination angles.

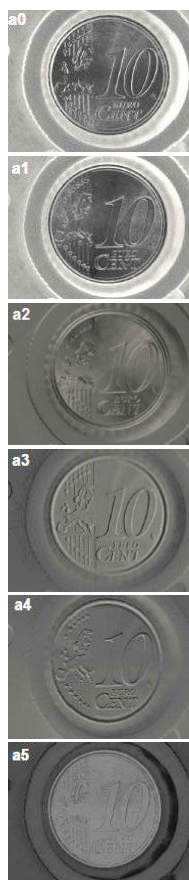
Based on the evaluation of the surface reflectance (BRDF and BTF), HELIOS can generate a batch of images resulting from the analysis.

The generated batch of images is the key of the process. Each image has its own physical component

For exemple :

- The image a5 represents the basic image which can be observed in classical TV inspection.
- Images a3 and a4 represent only the relief of the part in X and Y directions, thus displaying only the real distortions of the part.
- Images a0 and a1 represent the differences of reflectance

Thus, the analyst is able to determine if an indication is in relief (porosity, depression) or is on the surface with no form defect (crack, coloration, ...)



### 3D data generation

This process is also capable of generating an image in false color named « Normal Map »

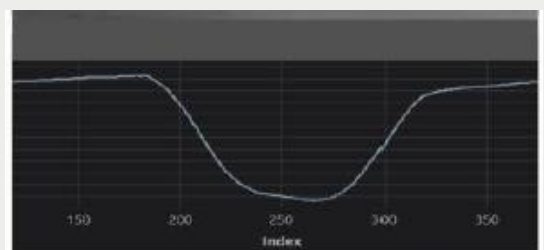
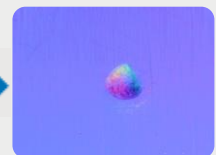
This image is a chromatic representation of the real orientation of the surface in every pixel.

By integrating all these datas, it is possible to generate a 3D mapping of the acquired zone and to make altimetric readings or to export these data

ACQUISITION IMAGE

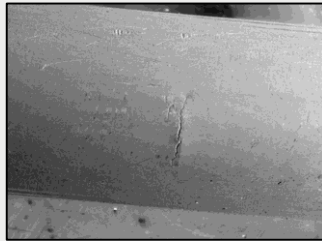
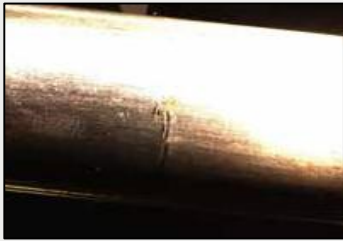


NORMAL MAP

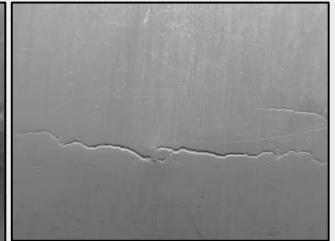
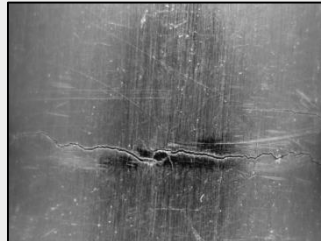


**Your performance,**  
**is our everyday commitment**

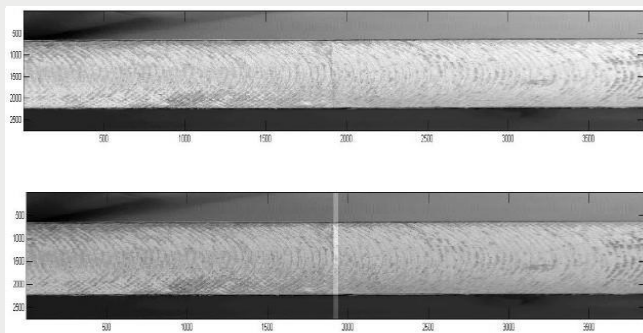
## Exemples of applications



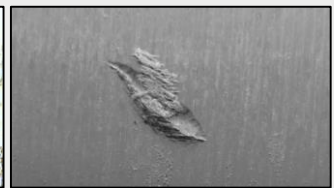
Raw TV image with direct illumination (left picture) compared to the image obtained with HELIOS processing (right picture)



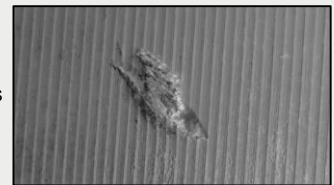
Improvement of the S/N ratio in the case of a crack in a steam generator mock up



Indication and automatic detection of a crack with a 40µm opening



Deletion of the colorimetric component and of the roughness on an images so as to show the defect without artefact



## Technical Features

### TECHNICAL CHARACTERISTICS

- Dome diameter : 50 mm
- Field of view : 9x9 mm
- Sensitivity : 10 µm
- Acquisition time : 5 s
- 2D reconstruction time : < 15 s
- 3D reconstruction time : < 30 s
- Adapted to all kind of roughness surfaces
- Robust : it admits loss of LEDs

### PHYSICAL CHARACTERISTICS OF THE HEAD MEASUREMENT

- Weight : 600 g
- Height : 210 mm
- Alimentation : PoE (max. 40 m)

### PC CONFIGURATION

- Windows 10 software
- Intuitive HIM
- Fix or portable computer
- Industrial touch tablet (in option)

## Supply

- Portable equipment constituted with a touch tablet and a head measurement with oriented LEDs.
- Comes as standard with a license to operate the HELI-OS software including the following modules :
  - Setting and sequencing
  - Direct visualization and acquisitions
  - Analysis and measurement

## Installation - Implementation - Update

- Supply in an industrial package
- Software installation / easy update
- Options :
  - Touch tablet
  - Waterproof version (IP68)
  - Formation
  - Deployment support

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