# AI IMAGE PROCESSING APPLIED TO COMPACT ON-LINE MICROSCOPE DATA

## Technical data

- Plug & Play
- Auto focus
- Field Of View: from 350µm to 3000µm
- Flash LED illumination time: 500ns
- Water cooling

## Purpose

Specialized in the field of optic measurement system, CRM Group has developed a low cost and compact on-line microscope (OLM) for the characterisation of any surface at microscopic level using machine learning.

This OLM is currently used to characterise the zinc grain size and surface aspect after hot dipping to quantify the reactivity and to determine link with process parameters.
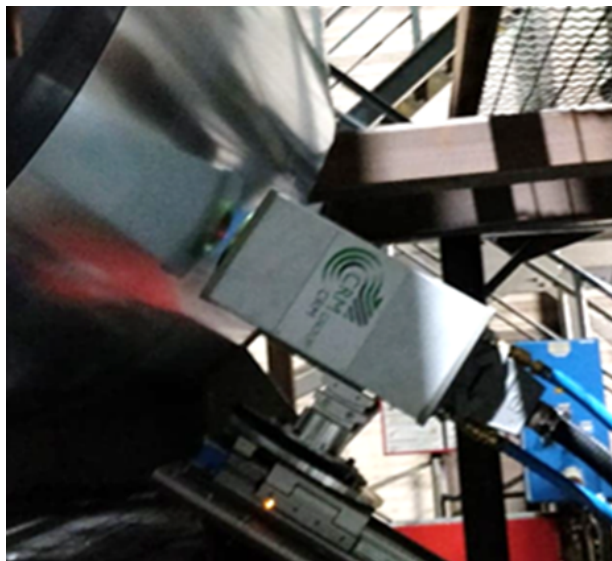


## Results

Recently, the same images from the OLM have been used to identify micro defects on the surface: zinc holes due to adhesion problems, scratches.

Recent advances in machine learning and CRM experience open so new perspectives in the analysis of images that were previously too complex to process automatically.

These new methods are the core of our detection algorithms and give promising results which could in the future help to identify for example adhesion problems and on any defects on galvanised products, and widely on any product for which surface quality is of high importance.

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## samples 1

Automatic segmentation of micro defects on images obtained during industrial measurement campaign with the OLM.

OLM image AI processing example: Scratches (green) - Zinc holes (yellow)
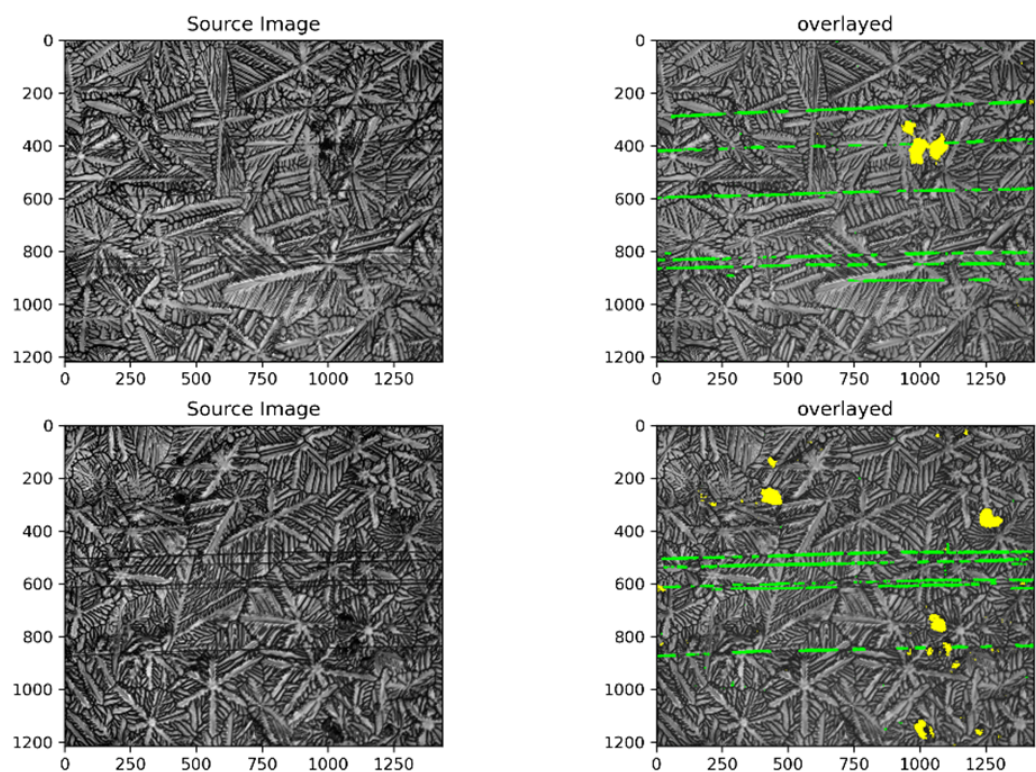
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## samples 2

Machine Learning for zinc aspect/reactivity classification to:
- Classify different aspects of the surface
- Find correlations with process parameters

Identified classes and On-line application example:



Class 1  Class 2  Class 3

Class 4  Class 5  Class 6

AHSS: DP600

Class 1
Class 2
Class 3
Class 4
Class 5
Class 6
Coil Start
LineSpeed
Zn Gauge
Jet Pressure

22:11:32  22:29:06  22:29:38  22:44:43  22:45:03  23:05:16

Grain Size ↑
Class 3 ↑
Class 4 ↓

Grain Size ↑
Class 1&2 ↑
Class 3 ↓

Grain Size ↓
Class 5 transient

Grain Size ↓
Class 4 ↑

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