

Porosity and Crack Analysis Image Analysis Report 389

Sample Description

Two images (GIF) were submitted for analysis. One showed porosity and the other porosity and cracks. No calibration tools were available with the image.

Purpose of Analysis

Demonstrate the ability of the Clemex Vision image analyzer to measure the porosity percentage and the crack anisotropy.

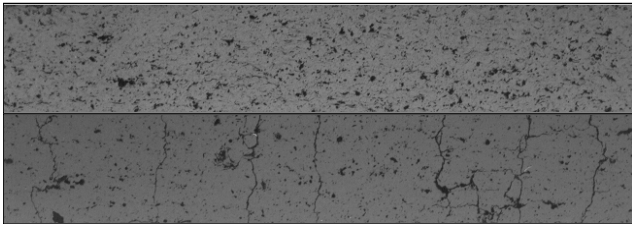


Figure 1: Original images (Top: IPM-12-TBC, Bottom: IPM-4-TBC). Calibration factor used = 1 $\mu\text{m}/\text{pixel}$.

Procedure

The **porosity** analysis is straightforward: Gray Threshold and Measurements. The **crack** detection needed a Top Hat gray instruction to detect the smallest and lighter parts of the cracks. Both Gray Thresholds from the original image and from the modified image were combined to binarize all cracks. A binary filter based on sphericity was applied to eliminate porosity from the red bitplane. Using the Thin binary instruction, the cracks skeleton was obtained prior to anisotropy measurement.

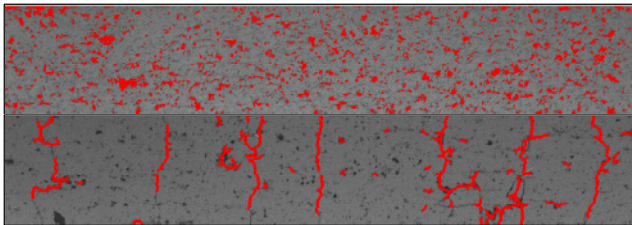


Figure 2: Features of interest into red bitplane just before measurement.

Results Summary

Results were cumulated for automated statistics and graph generation. Final results can be printed directly from Clemex Vision. Raw data are linked to their respective object and can be exported in Excel format. Please note that 1 micron = 1 pixel in this particular case since no scale line was available to calibrate the gif images.

Sample	
#1	9.97% Porosity
#2	1.28 of Anisotropy

It was possible to perform the requested measurements. However, a few features were measured as cracks that should not have been and some parts of cracks were eliminated with the porosity. Using higher resolution images is recommended to increase the small porosity and crack detection. This could be achieved by working at higher magnification or by using a higher resolution camera. Objects represented by only a few pixels do not produce reliable results. Also, achieving better image contrast should not be a problem and would help in discriminating the cracks from the porosity.

Equipment

Image Analysis System:	Clemex Vision PE
Image Size	648 x 110 pixels 650 x 100 pixels