COATING AND INCONEL CHARACTERIZATION

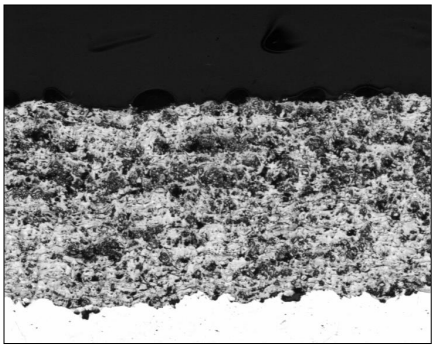

Figure 1: *Original image.*

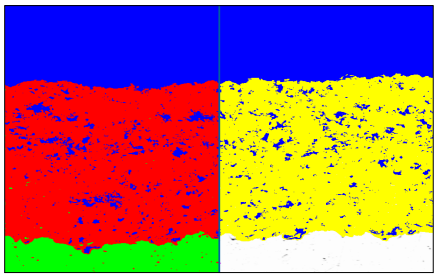

Figure 2a: *Binarization by Thresholding of the original image.*

Figure 2b: *Binary operations remove inclusions and dust particles from the coating.*

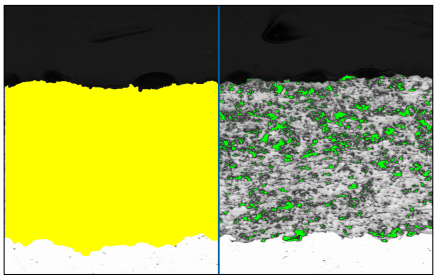

Figure 3a: *Coating (holes have been Filled; partial holes have been Closed).*

Figure 3b: *Porosity (green) isolated from the blue detection.*

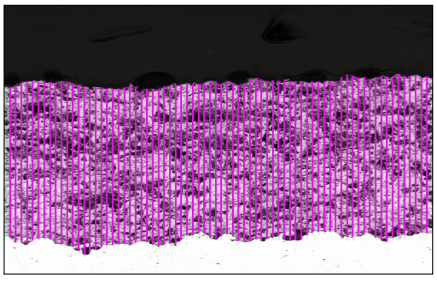

Figure 4: *Coating converted into measure lines.*

Sample Description

Six Inconel samples with different coating

Purpose of Analysis

Demonstrate the ability of the Clemex Vision image analysis system to automatically discriminate and measure the thickness and porosity of the coatings.

Procedure

The microstructure of the coating is viewed at 100X in Figure 1. The analysis was performed on a varying number of fields (depending of how many fields could be aligned on one row due to the curvature of the sample). Figure 2a shows the binarization by *Thresholding* of the original image. The coating, inclusions and dust particles are shown in red; the mounting media and porosity appear as blue while the substrate is shown in green. Several binary operations are used to remove inclusions and dust particles from the coating in Figure 2b. The holes in coating are filled and the porosity (green) isolated as shown in Figure 3. Figure 4 shows the coating converted into measurement lines by certain binary operations. Measurements were performed on these lines to obtain a distribution of the coating thickness.

Equipment

Image Analysis System:	Clemex Vision PE
Microscope:	Nikon Optiphot-2
Camera:	Sony XC-77CE B&W
Magnification:	100X
Stage:	Marzhauser EK8B-S1

Results

Total Coating Porosity: 8.25%

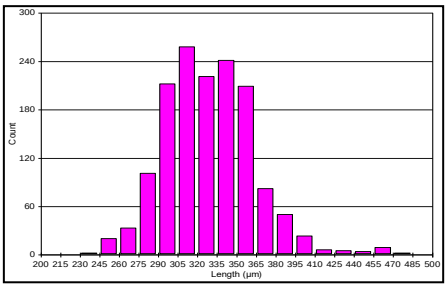

Figure 5: *Coating thickness distribution.*