

COATING CHARACTERIZATION OF SILICON CARBIDES

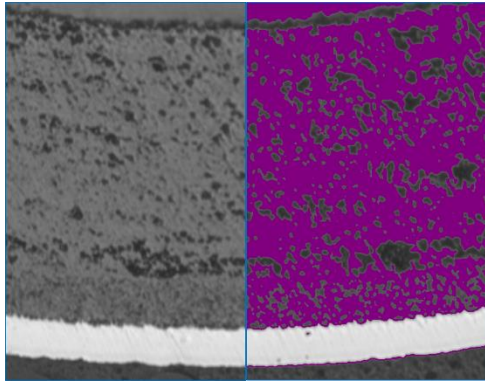


Figure 1: Original image with half-covered binarization layer.

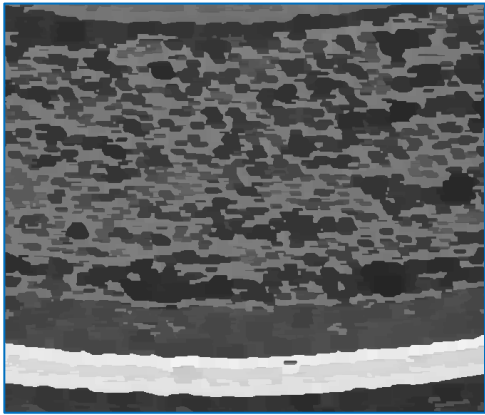


Figure 2: The original image after several gray operations.

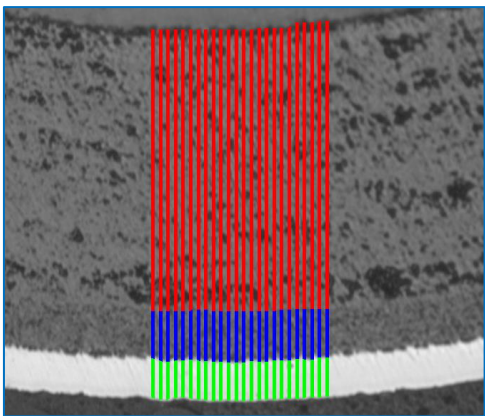


Figure 3: Final detection of the 3 coatings overlay against the original image.

Sample Description

One specimen of silicon carbide coating.

Purpose of Analysis

Demonstrate the ability of the Clemex Vision image analysis system to perform the coating analysis on samples containing three coatings.

Procedure

Figure 1 shows the original image, and half of it is performed the binarization by *Thresholding*. The outer coating is sufficiently clear to be analyzed without further treatment. The inner and the middle coatings have the same gray level range which could not be separated by thresholding. Certain gray filters are needed to apply to the original image. After several gray operations, it is possible to discriminate the middle coating from the inner layer. The final result can be seen in Figure 3. Figure 4 shows a zoomed image of the middle coating detection. Each line is measured to obtain a distribution of the coating thickness.

Equipment

Image Analysis System:	Clemex Vision PE
Microscope:	Nikon Epiphot 200
Camera:	Xillix MI 1400, Sony XC-77CE
	B&W
Magnification:	500X
Stage:	Marzhauser EK8B-S1

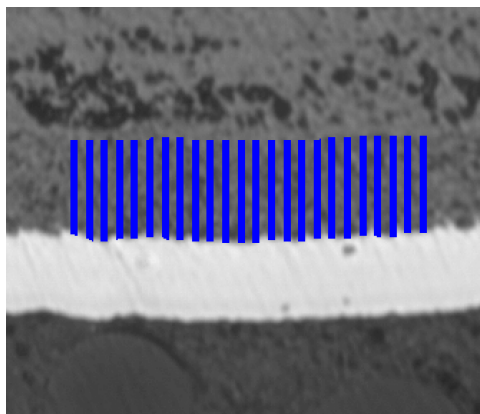


Figure 4: Zoomed image of the middle coating detection. Each line is measured to obtain a distribution of the coating thickness.

Results

	<i>Outer coating Thickness (microns)</i>	<i>Middle coating Thickness (microns)</i>	<i>Inner coating Thickness (microns)</i>
<i>Minimum</i>	40.3	7.6	5.6
<i>Maximum</i>	60.5	13.4	8.3
<i>Average</i>	51.6	9.8	7.5
<i>Standard Deviation</i>	4.6	0.9	0.3