

COATING CHARACTERIZATION OF MULTILAYERS SAMPLE

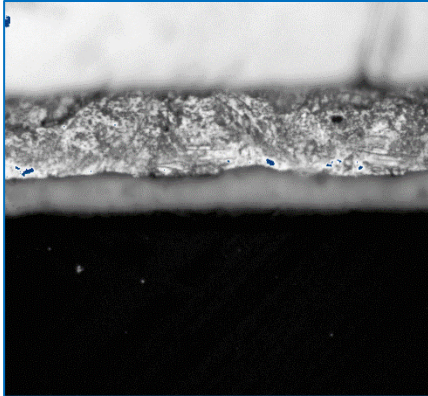


Figure 1: Original image.

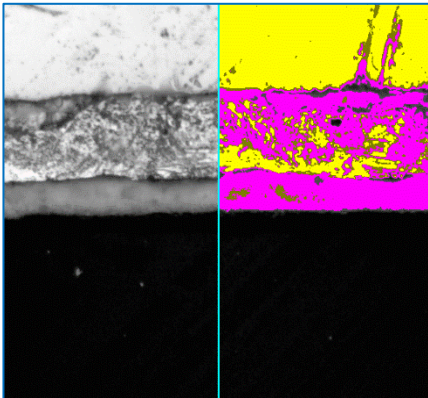


Figure 2a: Multi Layer Grab of the original image.

Figure 2b: Binarization by Thresholding of the reconstituted gray image.

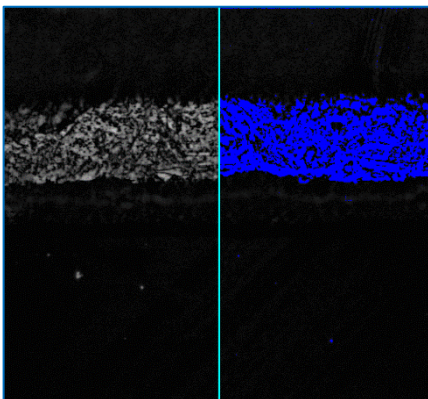


Figure 3a: Black Top Hat of the original image.

Figure 3b: Binarization by Thresholding of the preceding gray image.

Sample Description

One metallic sheet sample with two coatings (one covered with paint).

Purpose of Analysis

Demonstrate the ability of the Clemex Vision image analysis system and coating thickness module to detect and measure the 2 coatings and the layer of paint.

Procedure

The original image (Figure 1) is improved by a *Multi Layer Grab* as shown in Figure 2a. Figure 2b shows the binarization performed on the reconstituted gray image. Both layers are mostly in the same gray range (pink bitplane). The matrix appears as a yellow bitplane. A *Top Hat on Black* transformation isolates all black and thin objects. And a second binarization is executed on the transformed gray image in Figure 3. Three bitplanes are combined to distinguish the desired layers. To achieve this, several binary operations are developed in the routine. The coating outlines in pink and paint layer are transformed into measuring lines to allow a length distribution measurement.

Equipment

Image Analysis System:
Microscope:
Camera:
Magnification:
Stage:

Clemex Vision CORE
Nikon Epiphot 200
Sony XC-77CE B&W
500X
Marzhauser EK8B-S1

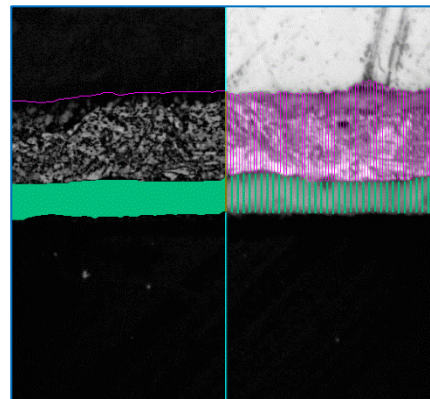


Figure 4a: Coating outlines in pink and paint layer in aqua overlay against the transformed gray image (Top Hat).

Figure 4b: Same bitplanes transform into measuring lines and overlay against the reconstituted gray image (Multi Layer Grab).

Results

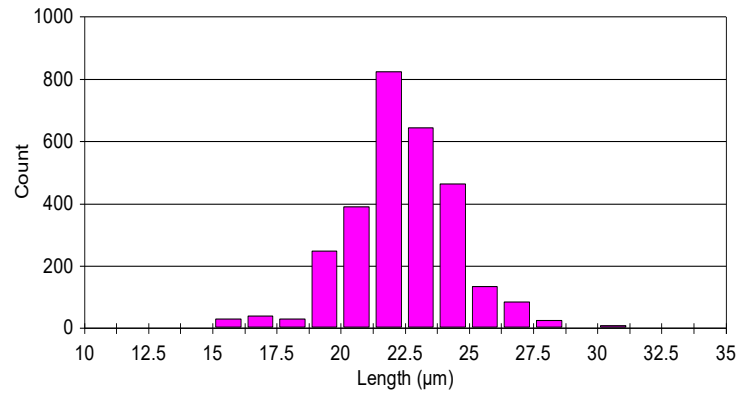


Figure 5: Length distribution of the coating.

	<i>Length of the first coating (μm)</i>	<i>Length of the second coating (μm)</i>	<i>Length of the paint layer (μm)</i>
Minimum	2.1	13.7	5.3
Maximum	68.5	31.2	16.3
Average	20.6	22.4	10.6
Standard Deviation	6.5	2.2	1.5