CLEMEX
Image Analysis Report

Application bulletin #135
for Materials

MORPHOLOGY CHARACTERIZATION OF COTTON FIBERS

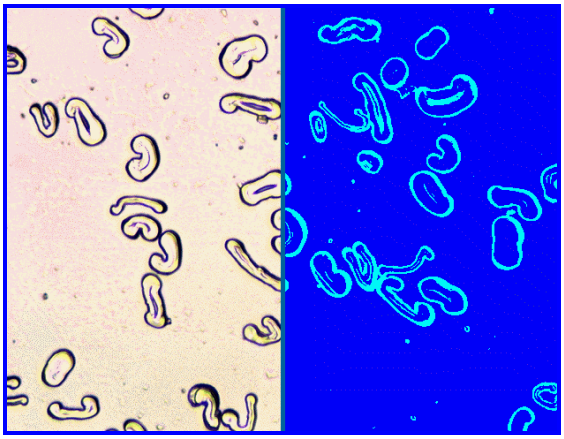

Figure 1: a) *Original image (400X, 0.3342 mm/pixel).* ***b)*** *Binarization by Gray Thresholding of the original image. Background and cotton fibers were detected in blue, outline and lumens were detected in cyan.*

Sample Description

One slide with two similar cross sections of the same specimen of cotton fibers

Purpose of Analysis

Demonstrate the ability of the image analyzer to automatically discriminate cross section of cotton fibers (without lumens) and, analyze surface and shape.

Several binary transformations were necessary to obtain a satisfactory representation of the cotton fibers without lumens and to remove artifacts. Zone, Boolean, Transfer, Invert and Fill binary instructions were used into this routine.

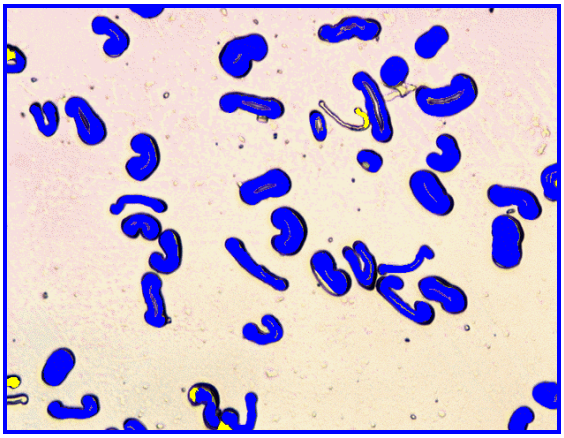

Figure 2: *Final image before measurements.*

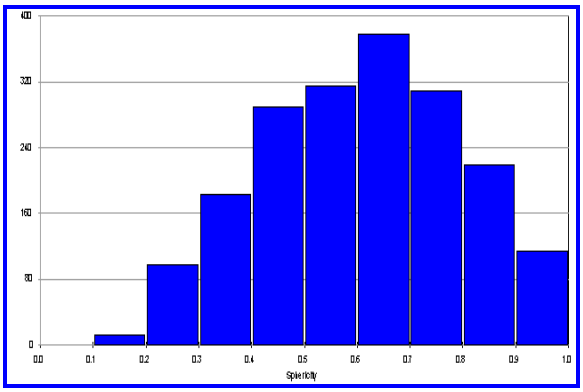

Figure 3: *Sphericity distribution of fibers after lumens have been removed (100 fields : 1915 objects).*

The main difficulty of this application was to fill the small holes and scratches without removing the lumens. Some objects overlapped each other. Most of them were separated or discarded but despite all precautions some still overlapped.

A Guard Frame was applied to eliminate all incomplete objects at the edges of each field. Objects that are eliminated are necessarily analyzed in a subsequent field since the stage moves in guard frame size steps.

Apparatus

Image Analysis System:	Clemex Vision Software
Camera:	Sony XC 77CE, B/W
Microscope:	Nikon Optiphot-2 (40X) with transmitted light
Stage:	Motorized marzhauser ek8b-s1 (100 x 75 mm) with auto focus drive