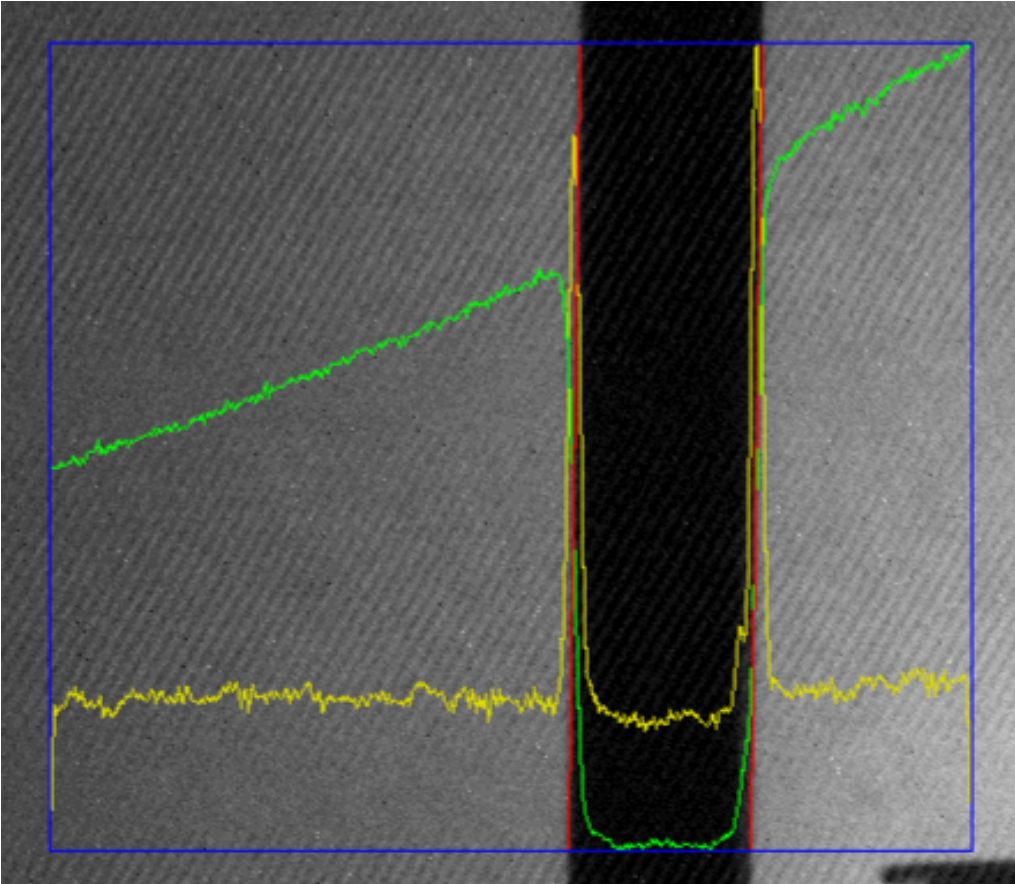


CPM1

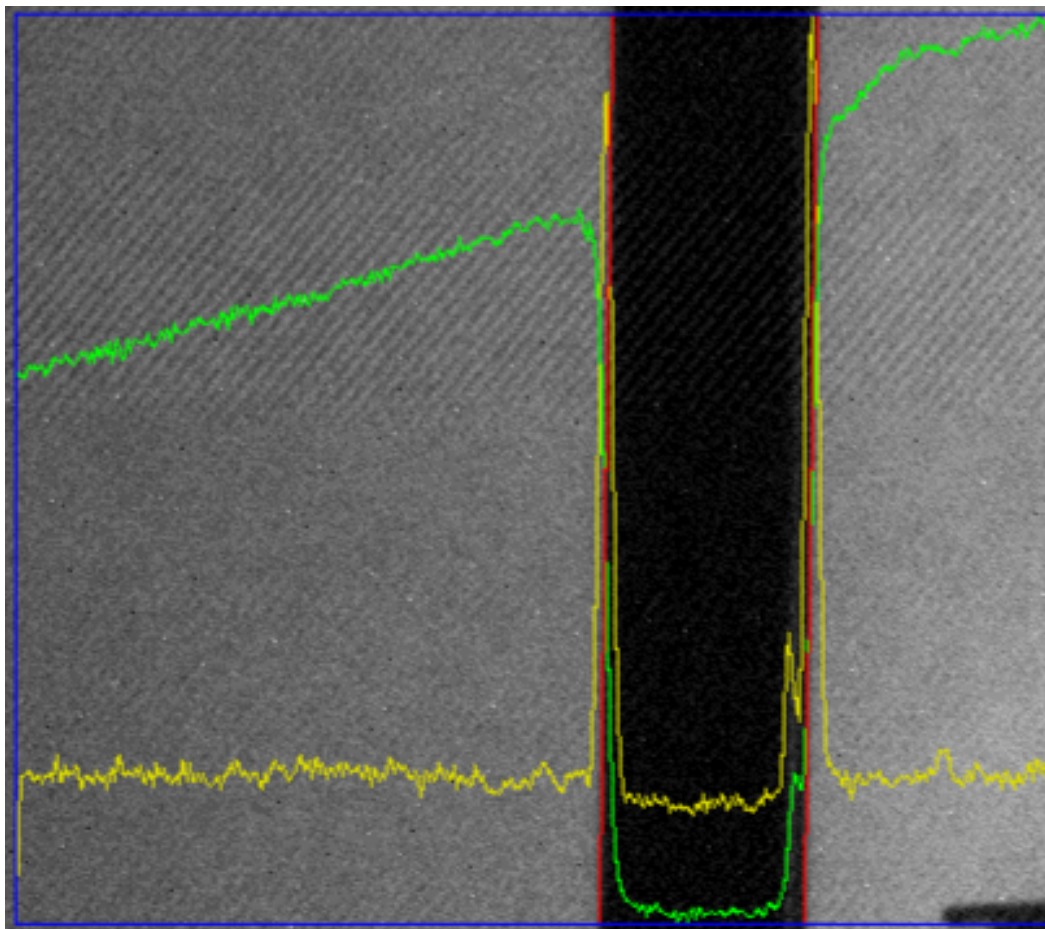
Uniform Illumination

Nathan Sayer

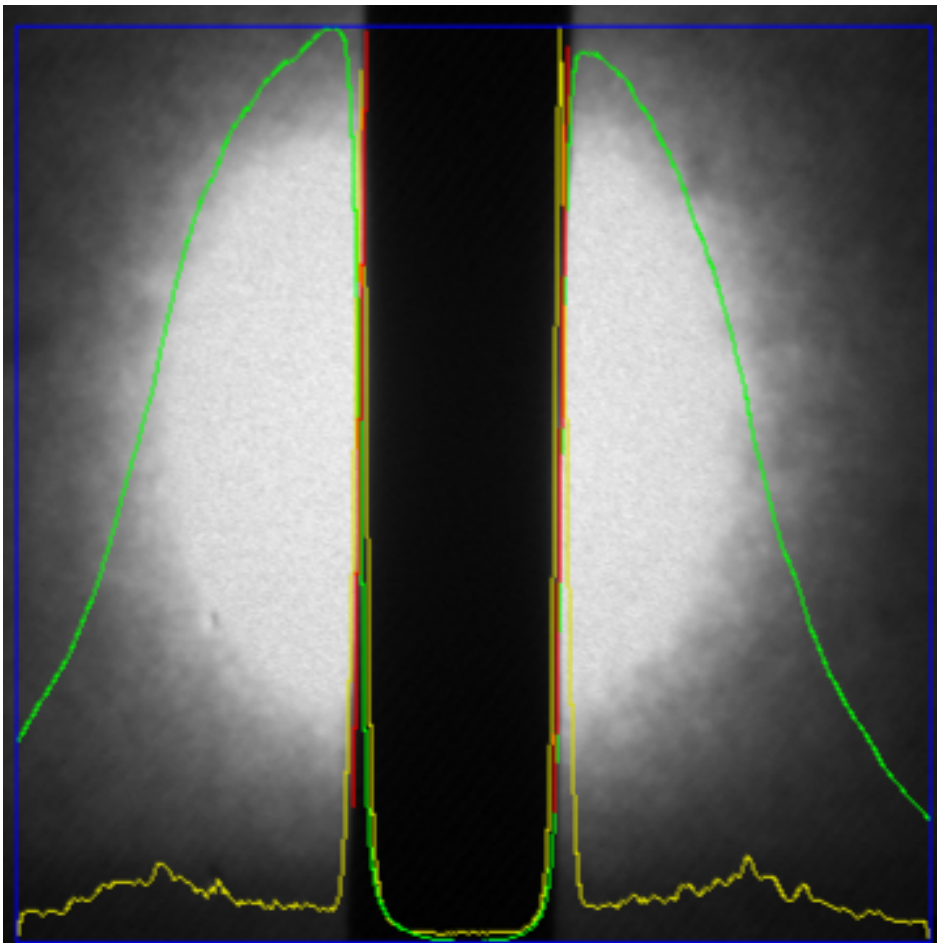


Optical Post is 20 cm from diffuser, as is the LED array. The LED array shines light on the diffuser at a 45 degree angle off to the right of the image.

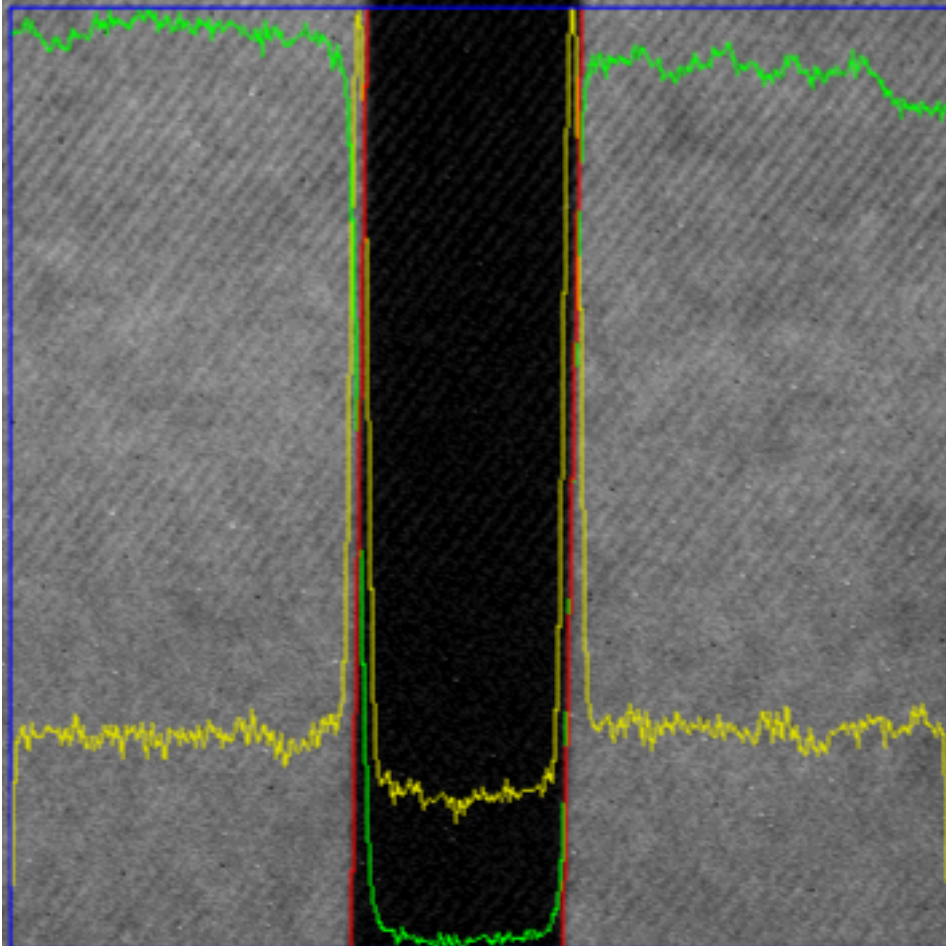
A “pass” is when the analysis of the BCAM instrument is able to draw a red line from the top to the bottom of the analysis square where the edge of the post is. The image “passed” and we were successfully able to analyze it when the exposure time is 80ms or greater.



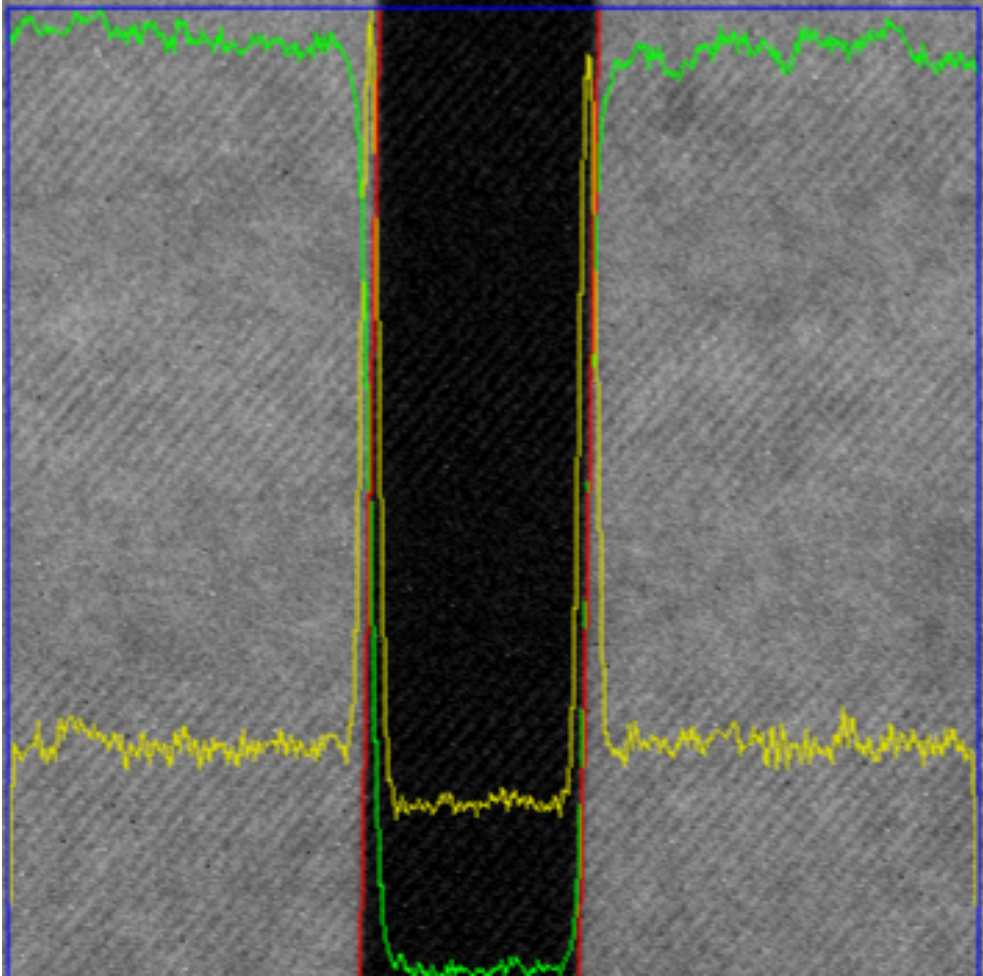
Same setup, except this time the LEDs and the object are both 30cm from the diffuser. 200ms exposure time is required to find the object's edges.



LEDs 2cm behind the diffuser, 500ms exposure time required.

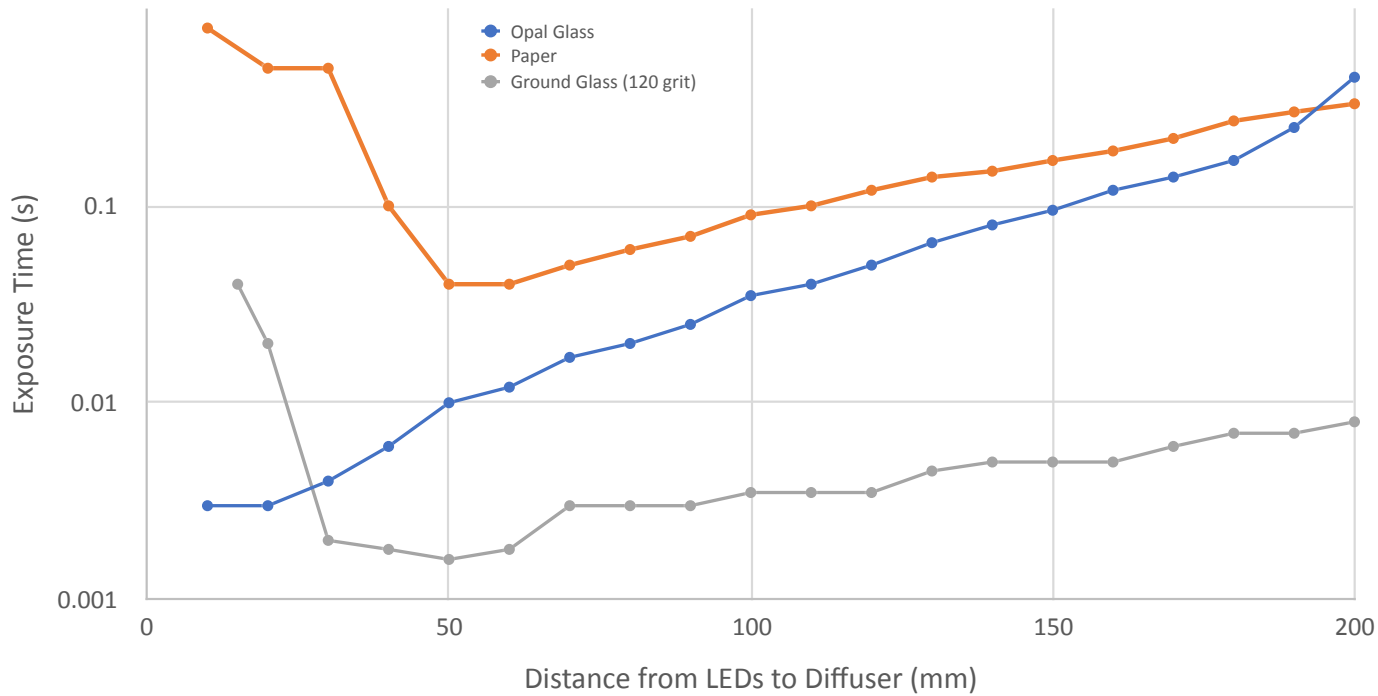


LEDs 15cm behind the diffuser, 200ms exposure time required.



LEDs 25cm behind the diffuser, 500ms exposure time required.

Exposure Required vs. Diffuser Distance to LEDs



We vary the distance from the LEDs to the diffuser, using both a paper and opal glass diffuser to determine what position gives the sharpest silhouette. The y-axis is the minimum exposure time required for the analysis to find both the left and right edge fully.

Minimum exposure time for paper= 40ms
 Minimum exposure time for opal glass= 3ms