

## Manufacturing Process Analytics

Identifying defective contact lenses to improve Product Yield by discovering and uncovering trends to identify defect root causes and corrective actions in real time



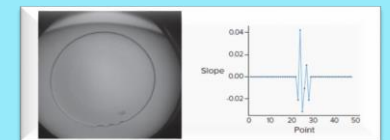
The client—a subsidiary of one of the largest global medical device, pharmaceutical, and consumer goods manufacturers—needed an automated method for identifying defects in the contact lenses it manufactures. It also needed to be able to classify those defects in real time (i.e., on the assembly line) so that appropriate, immediate corrective measures could be taken.

The client sells a wide range of lenses, which are produced in masses. Prior to the solution delivered by Intuceo's Platform, lens defects had to be checked manually—an approach that was costly, tedious, and prone to human error. The impact on the business was obvious: needless additional manufacturing and logistical costs (e.g., due to product returns) as well as lower customer satisfaction.

Lens defects involve edge tears and surface distortions. The client provided images (i.e., unstructured data) of non-defective and defective lenses to help the Intuceo team identify, compare, and

categorize defect types. Intuceo created a means of reading the image data and measuring the deviation between non-defective and defective lenses of various types. With the implementation of a custom algorithm to classify defects, (taking into account the differences of lens radii) the client was able to plot their outcomes (see figure below) and easily classify the defective lens in real time.

Intuceo developed an algorithm that enabled users to categorize lens defects into various classes which employs heuristics (i.e., if-then rules) to classify defective lenses with top notch accuracy. Overall, the client was able to identify and classify defective lenses in real time, resulting in manufacturing and logistical cost savings, better product quality, and moreover, a substantial competitive edge.



**Figure:** On the left, an image of a defective lens with a jagged edge; on the right, the mathematical measure of the difference between the radii of a non-defective lens (i.e., the straight vertical line) and a defective lens.