

Doublet alignment with OEG's OTS200 and Lens Test

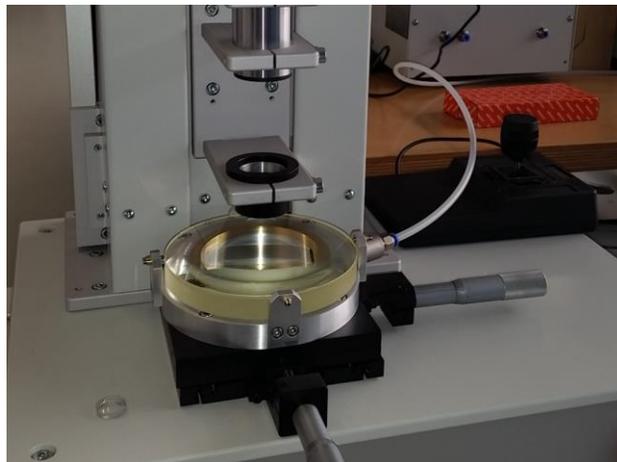
Introduction

I recently had the opportunity to try out, first hand, OEG's Lens Test software for the alignment and cementing of a doublet and was really impressed. With some simple tooling to facilitate controlled movement of the crown (positive element) relative to the flint (negative element) and with the feedback from the OEG system, the doublet was aligned with ease.

The doublet to be aligned was over 5 inches in diameter and the desire was to get all centers of curvature on a common axis to within 10um. The OEG Lens Test system has the capability to find all of the centers of curvature of a system with a single axial scan. It then computes where the axis of the flint lies and provides a target for the user to align the upper surface of the crown to. It's a simple matter of sliding the upper element on the lower element until you've reached the target position and then curing the cement.

A unique aspect of the process is that it relies on a precision column and software algorithms rather than requiring the elements to be rotated. Instead of working to bring each center of curvature to a common rotational axis, the system is able to determine where the upper surface should be positioned in order to put all centers of curvature on a common axis.

Setup

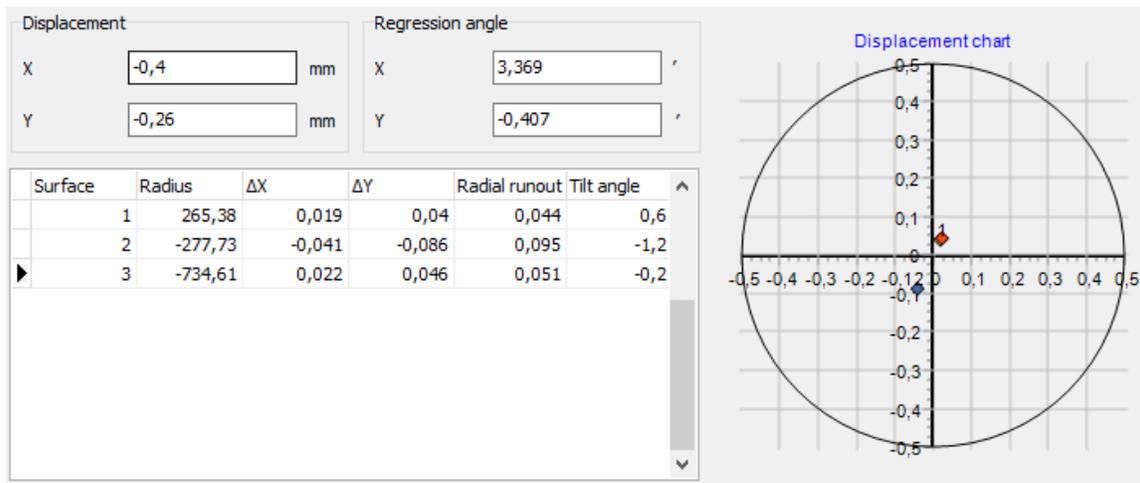


Setup Notes:

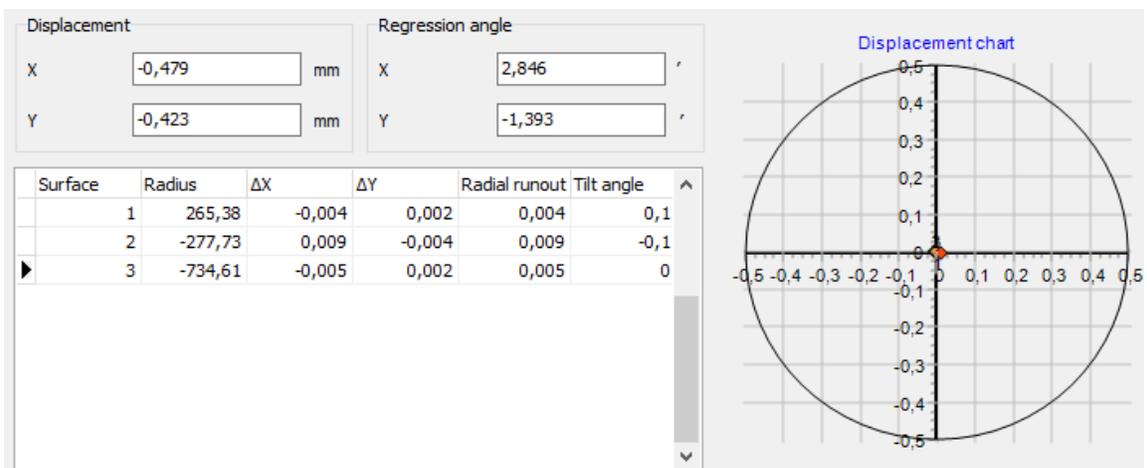
- There are 4, 80 pitch screws surrounding the doublet to actively align the upper element to the lower element.
- The lower element can be secured with vacuum
- Alignment goal was to have all centers of curvature aligned to a common axis within 10um (see "Radial runout" column in the screen shots. (10um relates to better than 2 - 5um of TIR for the long radius surfaces of this doublet)

Example Results

Element Centered by Edges (prior to active alignment on OTS)



Doublet Centered on OTS (no extra iterations)



For more on alignment and cementing without rotation check out this video:

<https://youtu.be/Yz4Gfrvqej4>