



Case Study

ZONE3 Advanced Metrology Software

Focus: Variables with Contact Lenses

Challenge: Often a family of parts is produced in a series of different sizes, only varying in a few dimensions. One of the most complex type of parts produced in families are contact lenses. Lenses present an interesting measurement challenge due to the varying spherical surfaces and the optical zones. Conventional measurement methods and software require us to build project files for each individual lens in a family to ensure that part number is measured correctly. A library of projects for a large family of parts can be very time consuming to create and to maintain.



The ZONE3 Advantage: QVI® ZONE3™ 3D-CAD based metrology software is designed to make short work of part families. Instead of building project files for each individual part in a family, one project can be built and applied to the whole family using variables. Critical dimensions on a contact lens include the optical zone (what your eye sees out of), the spherical surface (the zone beyond the optical zone) and the orientation mark (typically a protrusion on the lens which helps the contact stay in the correct orientation on a pupil). We can apply variables to each critical dimension so that the sensors and finders are placed according to that feature's parameters. Through a popup report header, the operator only needs to specify the part number and ZONE3 takes care of the rest. In some cases, a distinguishing part feature can identify the part in the family, and adjust the routine accordingly with no operator action.

With traditional programming if you have a program for each contact lens in the family, you would typically have to change all project files every time a design change is made. With ZONE3 a design change in the family can be accommodated by a simple parameter modification. Reduced redundancy ensures that the program stays accurate and true to the print throughout design revisions. One program means only one validation in regulated environments. ZONE3 makes it easy to add to or remove parts from a family: simply add another column of variable data that defines the new part parameters.

	PN1	PN2	PN3
Optical Zone	14.5 mm	15.25 mm	16 mm
Spherical Zone	A	S	T
Orientation Mark	30°	35°	40°

The Result: ZONE3 successfully reduced programming time of a family of contact lenses by creating a single program that could be used by the whole family. This helped to reduce setup costs, minimize maintenance as the part family changes over time, and cut down on potential operator interaction problems resulting in consistent measurement techniques.