

ZEMAX[®]

Optical Design Program

User's Guide

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This feature is similar to the 2D DXF export feature described in the previous section. The key difference is that the 3D DXF supports systems that are not rotationally symmetric.

Miscellaneous

Reverse Elements

Purpose:

Reverses a lens element or group.

Settings:

Item	Description
First Surface	This is the first surface of the lens group to be reversed.
Last Surface	The last surface of the lens group to be reversed.

Discussion:

The feature may not work correctly in all cases if mirrors, coordinate breaks, multi-configuration controlled data, surface tilts and decenters, or non-standard surfaces are included in the range of surfaces. Check the reversed system results carefully to verify that the desired result was achieved.

Tilt/Decenter Elements

Purpose:

Tilts or decenters a single surface or a group of surfaces forming an element.

Settings:

Item	Description
First Surface	This is the first surface of the lens group to be tilted/decentered.
Last Surface	The last surface of the lens group to be tilted/decentered.
Decenter X, Y	The X and Y decenters in lens units.
Tilt X, Y, Z	The rotation about X, Y, and Z in degrees.
Order	Either tilt then decenter, or decenter then tilt.
Coord Brk Color	Selects the spreadsheet display row color for the inserted coordinate breaks. See "Row Color" on page 71 for a description of Row color.
Coord Comment	The comment string for the inserted coordinate break surfaces.
Hide Trailing Dummy Surface	If checked, any trailing dummy surface inserted as part of the tilt and decenter tool modifications will be checked with the options "Skip Rays To This Surface" and "Do Not Draw This Surface". See "Surface properties draw tab" on page 72.

Discussion:

The feature inserts coordinate break and dummy surfaces as required to tilt and/or decenter a single surface or a range of surfaces. For more information on coordinate breaks see "Coordinate Break" on page 256.

Scale Lens

Purpose:

Scale will scale the entire lens by the specified factor. This is useful for scaling an existing design to a new focal length, for example. Wavelengths are not scaled. The scale lens feature may also be used to change the units from mm to inches, or other combinations of unit types.

Settings:

Item	Description
Scale by factor	If selected, then a scale factor may be entered directly.
Scale by units	If selected, then the lens will be converted by the selected units.

Discussion:

Scaling of data is performed based upon the units of measure for the data. If the scale factor is X, then data measured in lens units of length will be scaled by the factor X. Data measured in units of lens units squared (such as millimeters squared) will be scaled by X squared. Some polynomial coefficients, such as those on the Even Aspheric surface, have units that change from term to term, and ZEMAX accounts for this when scaling the data. Other parameters, such as the conic constant, are dimensionless, and are therefore not scaled.

ZEMAX will generally scale all lens data in the Lens Data Editor, the Extra Data Editor, and the Non-Sequential Components Editor correctly. ZEMAX also will scale almost all of the data in the Merit Function Editor, the Multi-Configuration Editor, and the Tolerance Data Editor correctly as well.

ZEMAX will not attempt to scale some types of data, even though scaling would be appropriate for those types of data. These exceptions are for data items such as the multi-configuration operand PAR3, that modify general parameter data of surfaces or objects. These data items should be scaled manually, if required.

Data items that are not scaled properly should be reported to ZEMAX technical support.

Make Focal

Purpose:

Make focal length is similar to scale lens, except the desired focal length is typed in directly. The entire lens is then scaled to make the focal length the specified value.

Quick Focus

Purpose:

Adjusts back focal distance for best focus. See also "Quick Adjust" on page 228.

Settings:

Item	Description
Spot Size Radial	Focus to best RMS spot radius image surface.
Spot Size X Only	Focus to best RMS x direction spot size image surface.
Spot Size Y Only	Focus to best RMS y direction spot size image surface.
Wavefront Error	Focus to best RMS wavefront error image surface.
Use Centroid	Reference all calculations to the image centroid rather than the chief ray. This option is slightly slower, but more appropriate for systems dominated by coma.

Discussion:

This feature adjusts the thickness of the surface prior to the image surface. The thickness chosen is that which minimizes the RMS aberration. There are several different RMS computations that may be performed as described in the "options" table above. The "best focus" position depends upon which criterion is selected. The RMS is always computed as a polychromatic average over the field, using the defined fields, wavelengths, and weights.

Quick Adjust

Purpose: