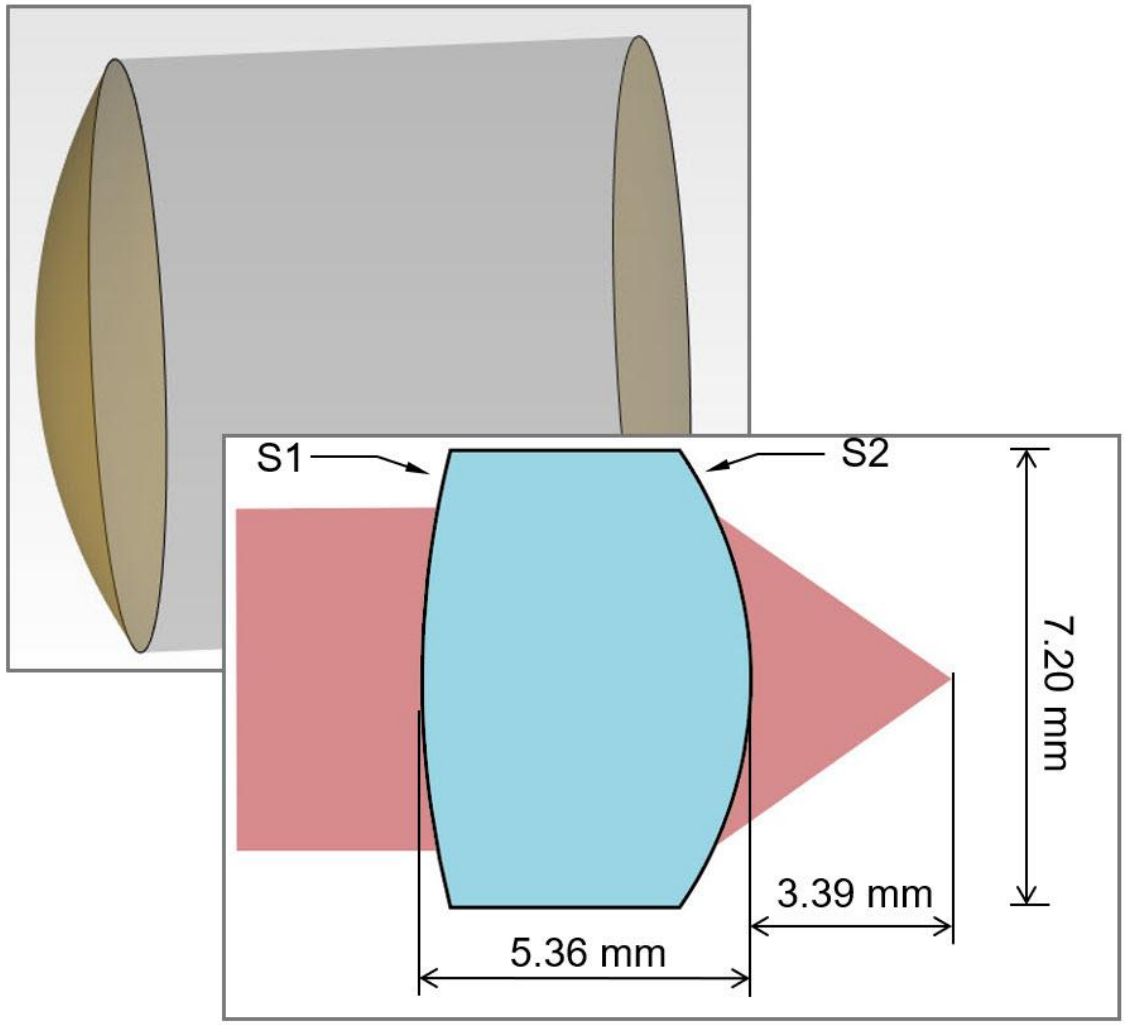
Including Lens Systems in the Optical Setup

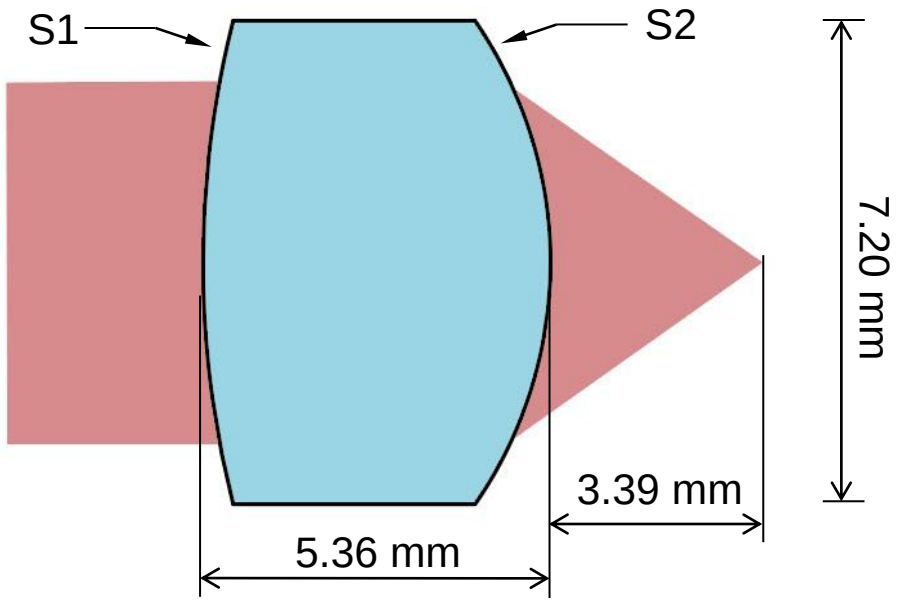
Abstract



In this document we present possible workflows on how to transfer the parameters of a given lens (from e.g., the manufacturers data sheets) into VirtualLab Fusion. As an example, we use an aspheric lens where the surface parameter as well as the medium is transferred into a Lens System Component.

Example Lens Data

Thorlabs aspheric lens A110 - B



- design wavelength: 780 nm
- material: H-LaK54

	R / mm	k	A2 / mm^{-1}	A4 / mm^{-3}	A6 / mm^{-5}	A8 / mm^{-7}
S1	41.07	-	-	-	-	-
S2	-4.76	-1.256813	-	-7.7454042 E-04	1.9209200 E-06	1.7823124 E-07

Lens information from Thorlabs: www.thorlabs.de

I: Selection per Component Catalog

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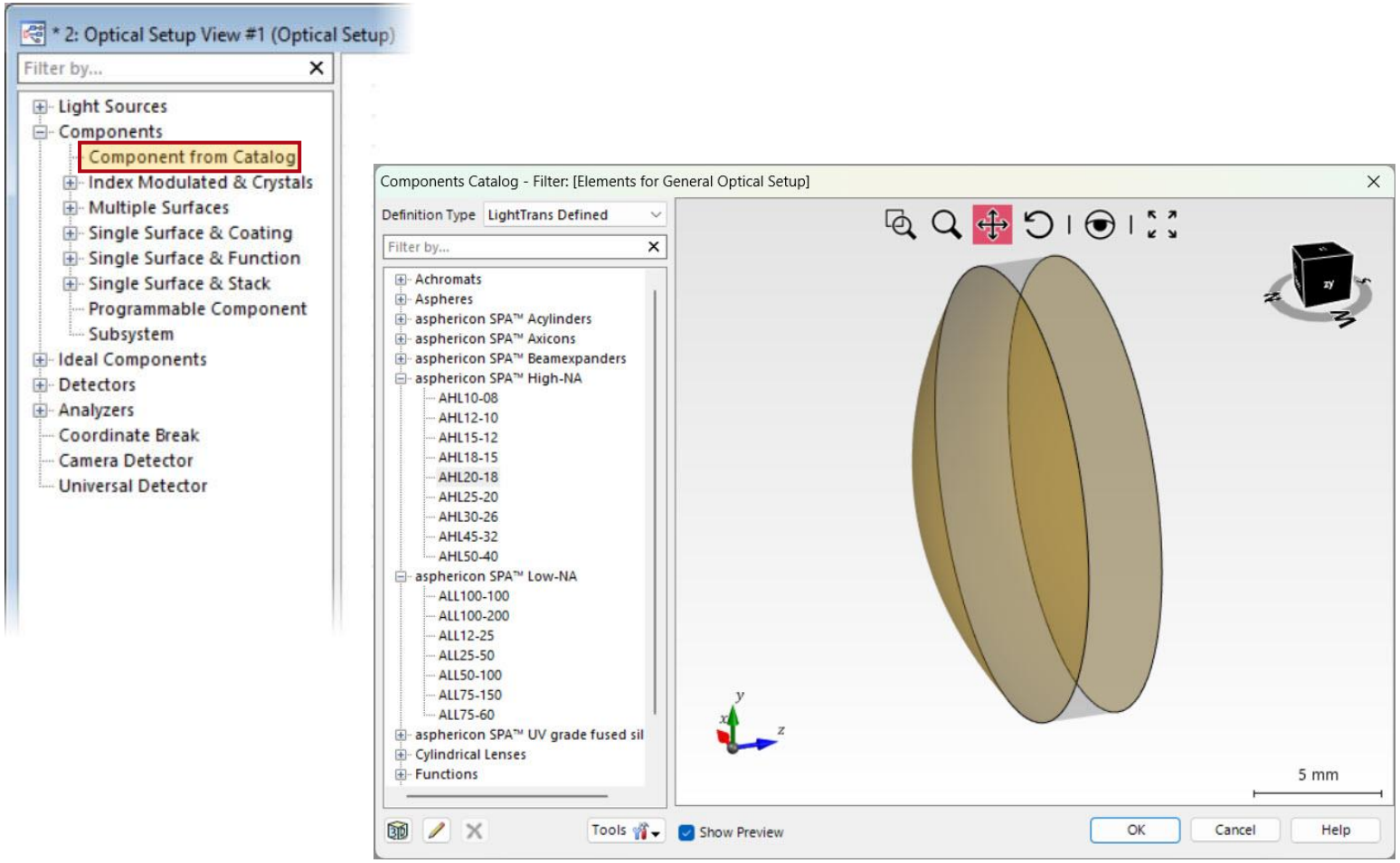

The inbuilt component catalog already offers a selection of various components from different distributors. Once a lens system is defined in VirtualLab Fusion, it also can be saved in the catalog for further uses.

II: Import per Zemax-File

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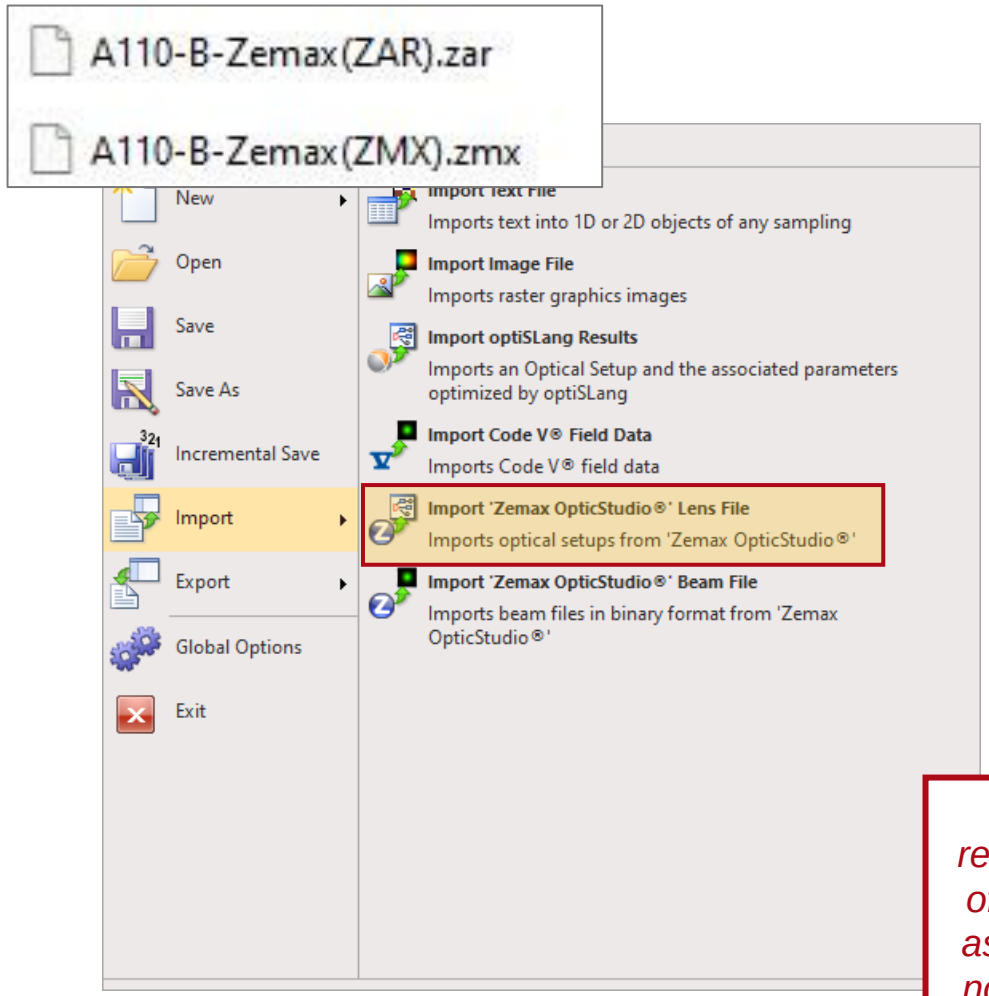
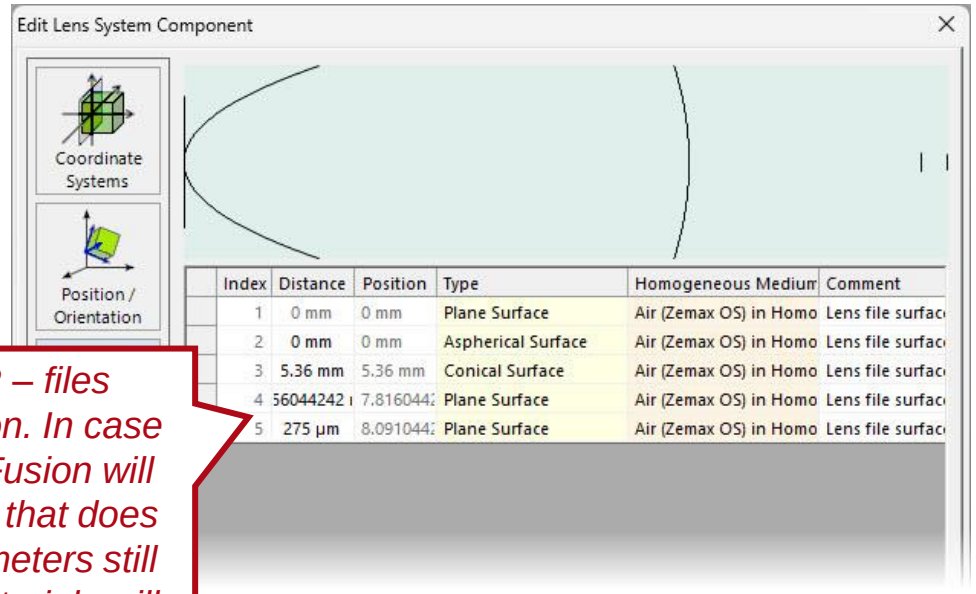


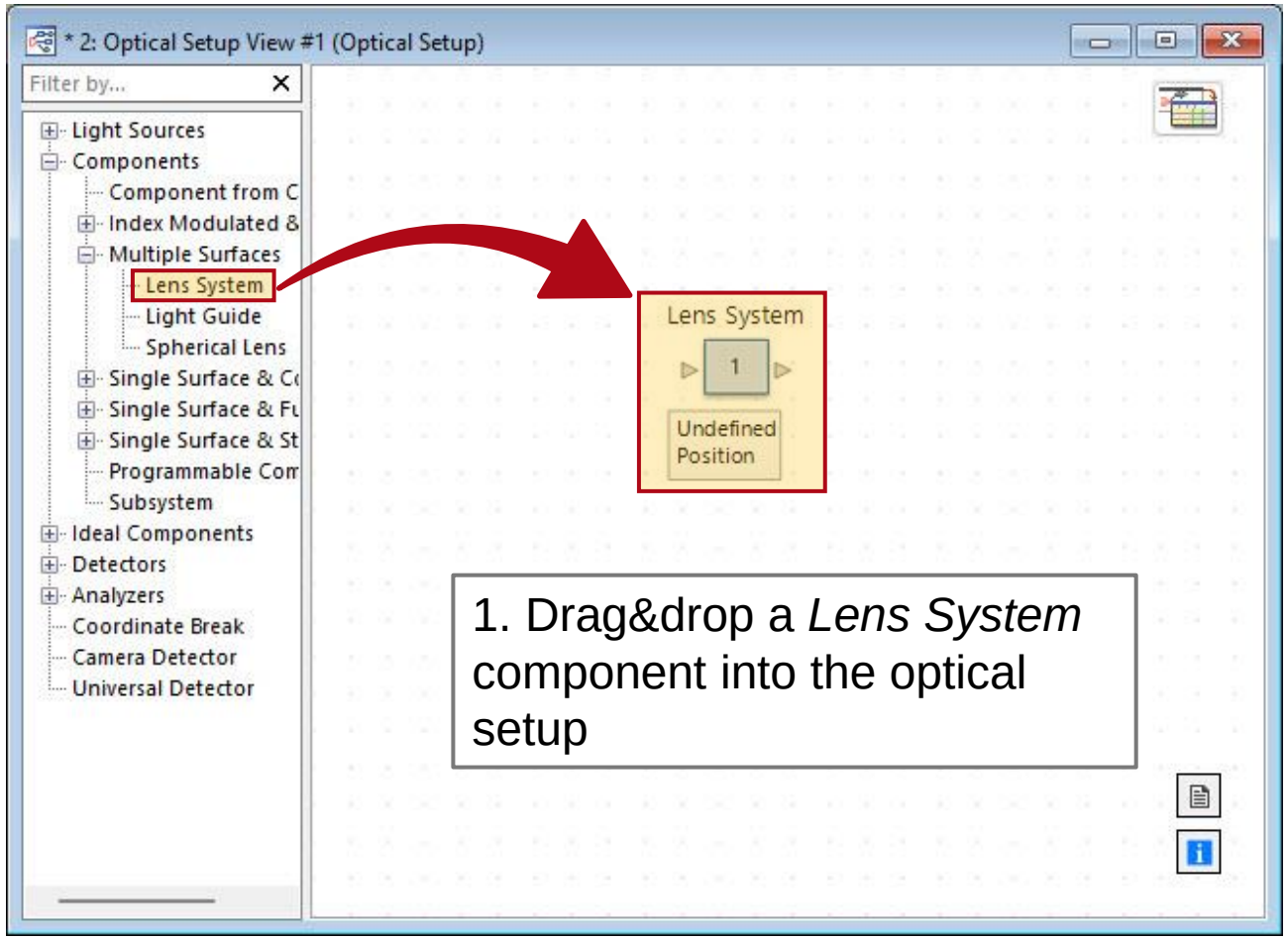
If the manufacturer offers Zemax-Files for the system, they can be used to import it into VirtualLab Fusion. For in-depth guide on how to import Zemax-files, please see: Import Optical System from Zemax Studio(c)

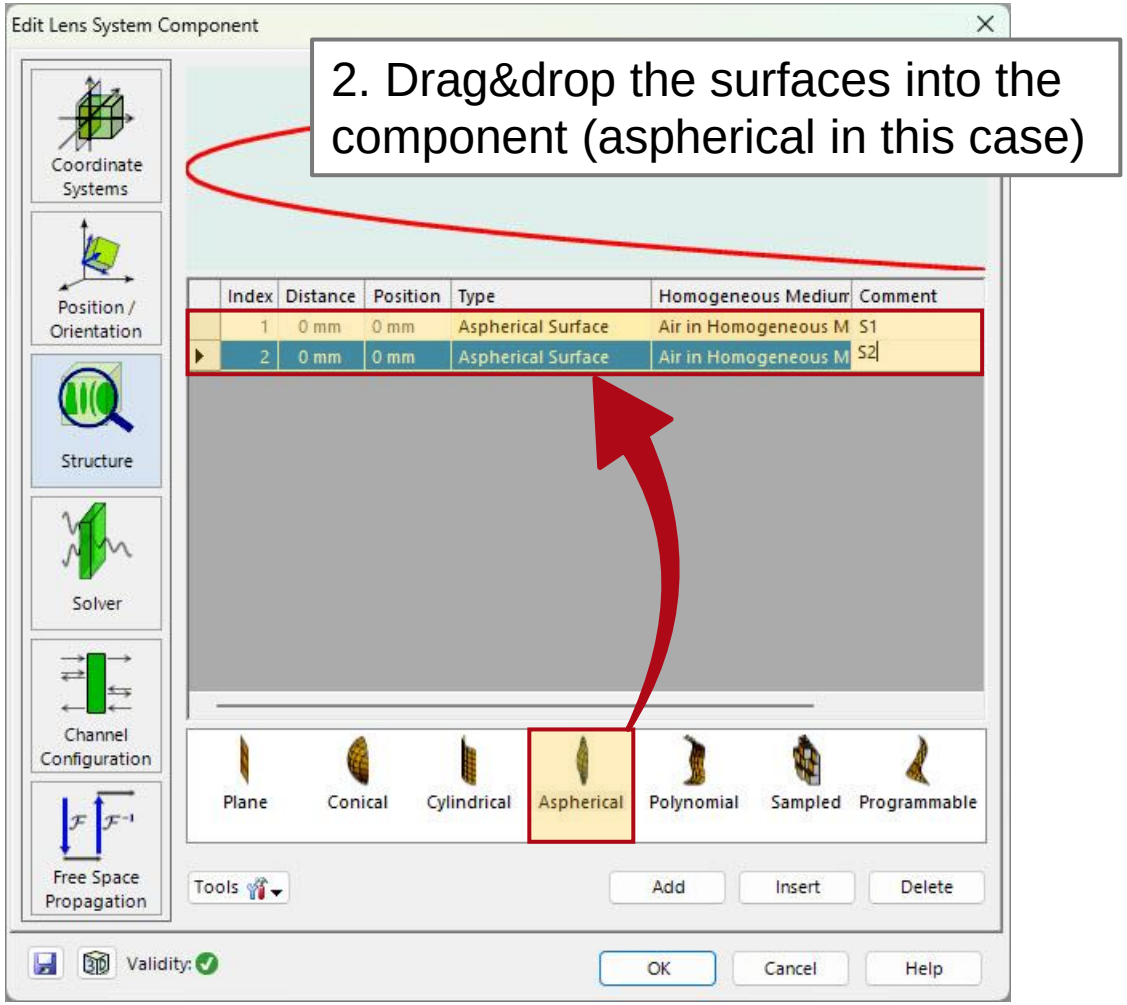


Note: The import of ZAR – files requires a Zemax installation. In case of ZMX – files, VirtualLab Fusion will ask for a glass database. If that does not exist, the surface parameters still can be imported, but all materials will be set to air.

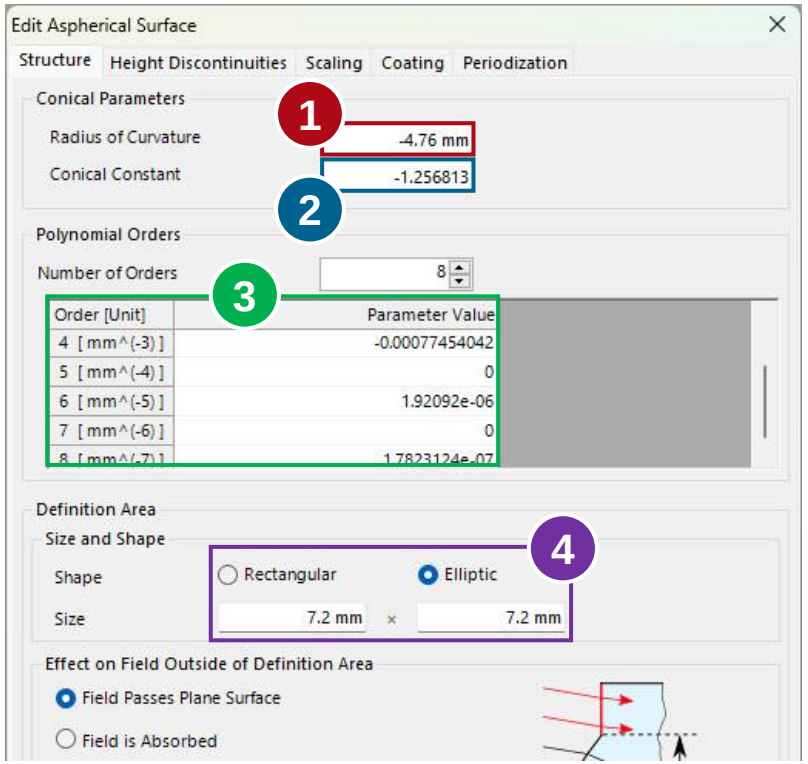
III: Definition per Lens System Component

Specify Lens System Component

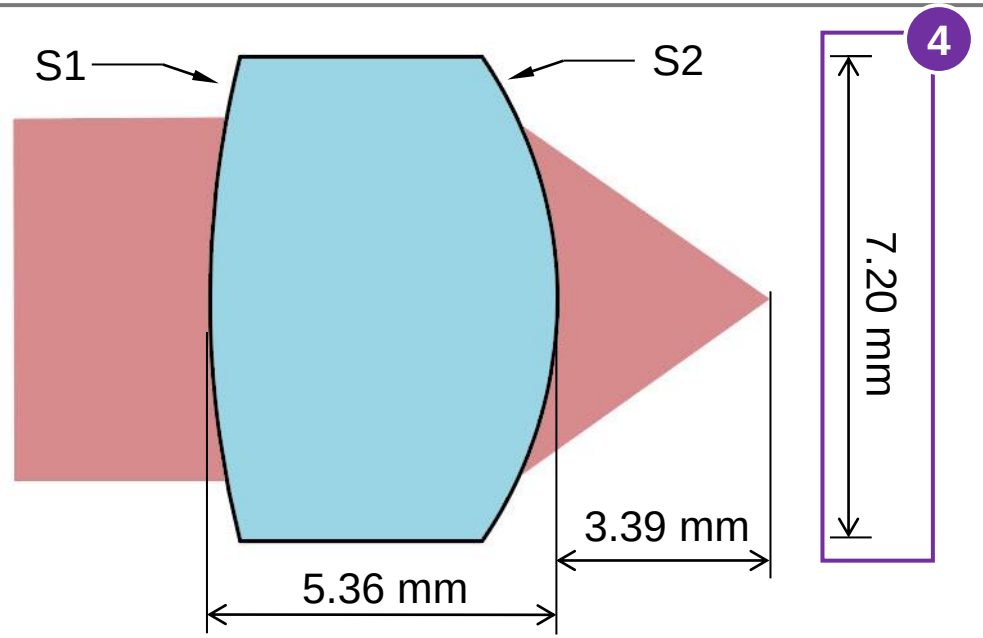




Transfer Parameter of the Aspherical Surface

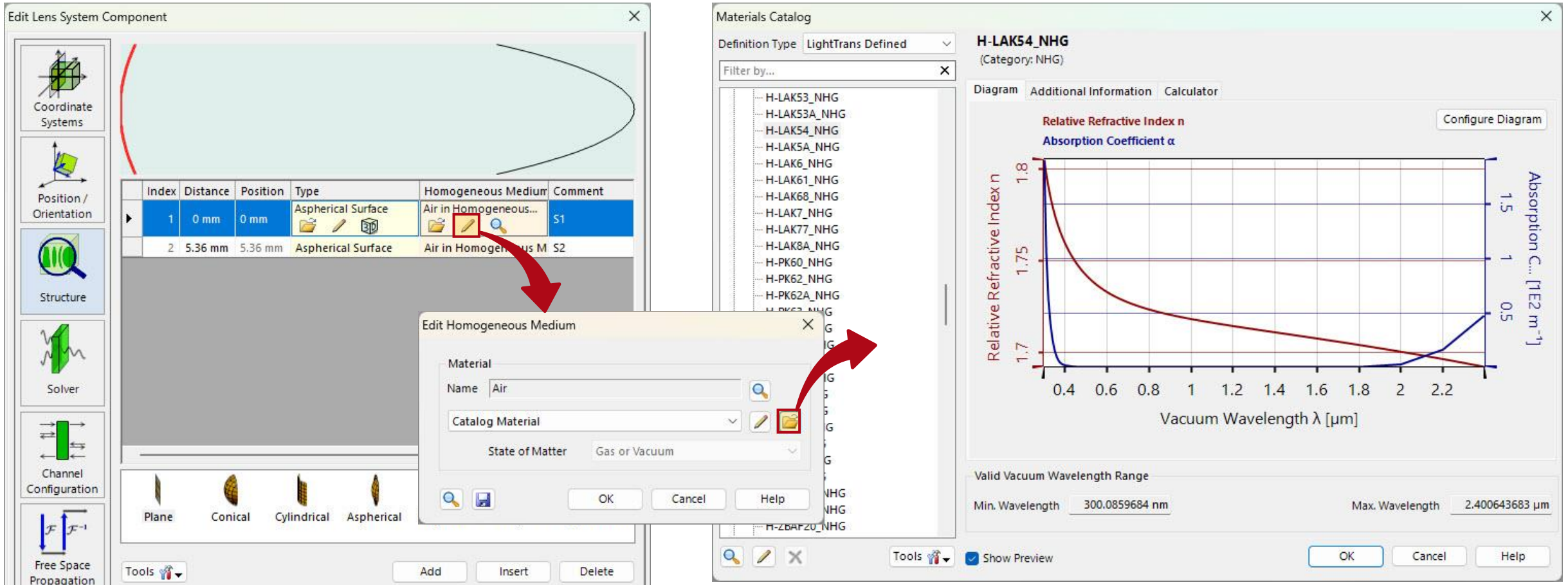


3. Include surface parameter in the corresponding places (only shown for S2, but the option window for S1 looks identical)



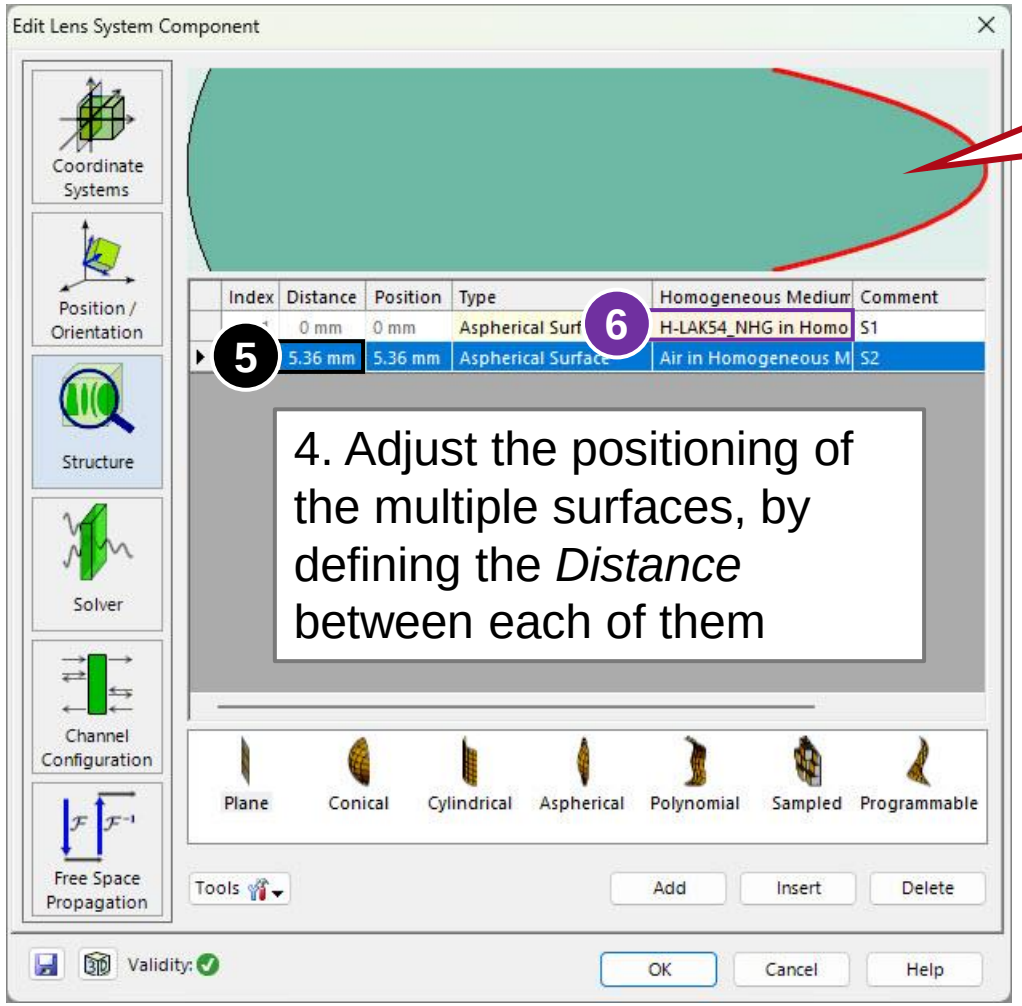
	R / mm	k	A2 / mm^{-1}	A4 / mm^{-3}	A6 / mm^{-5}	A8 / mm^{-7}
S1	41.07	-	-	-	-	-
S2	1 -4.76	2 -1.256813	3 -	-7.7454042 E-04	1.9209200 E-06	1.7823124 E-07

Add Medium To Lens System Component

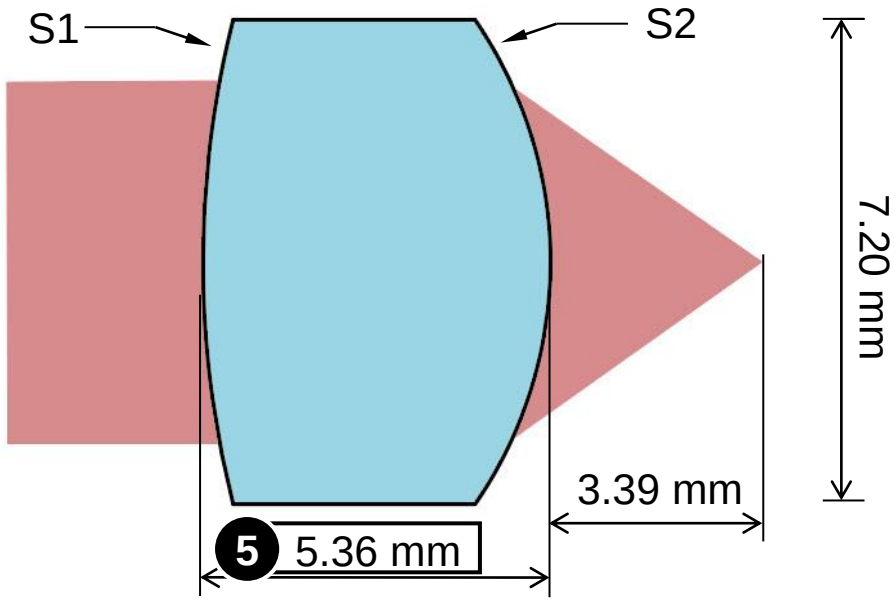


4. Open material catalog and choose the appropriate material

Add Medium To Lens System Component

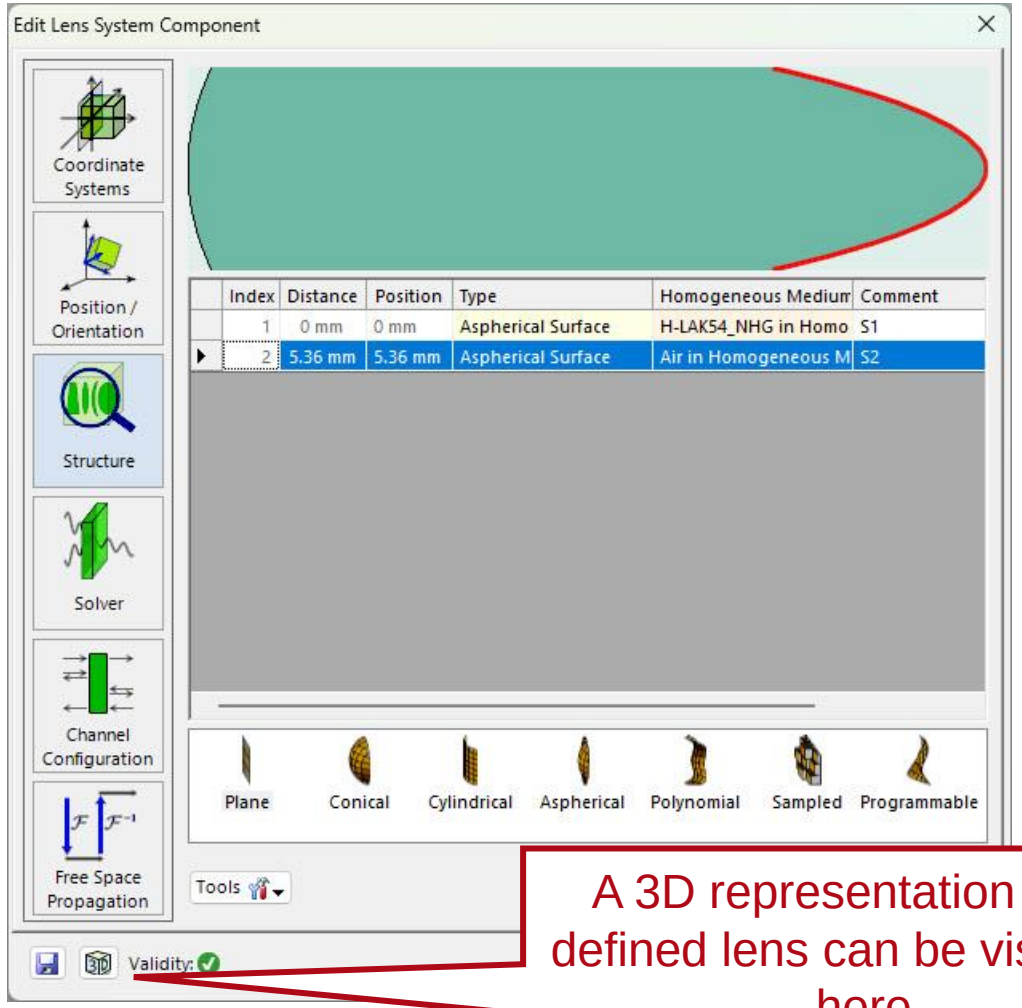


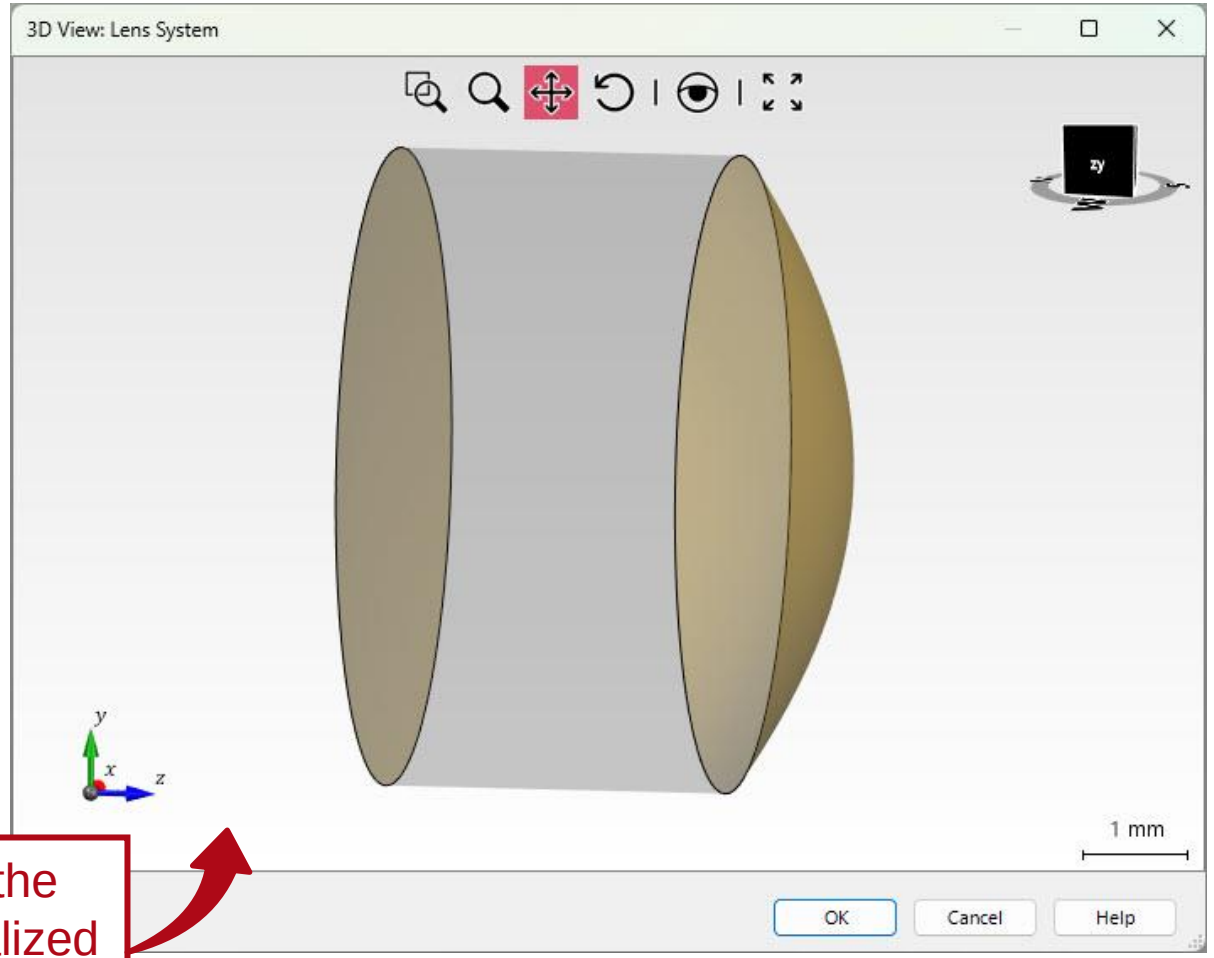
The darker color between the surfaces indicates in general a medium with a higher refractive index.



- design wavelength: 780 nm
- material: H-LaK54 6

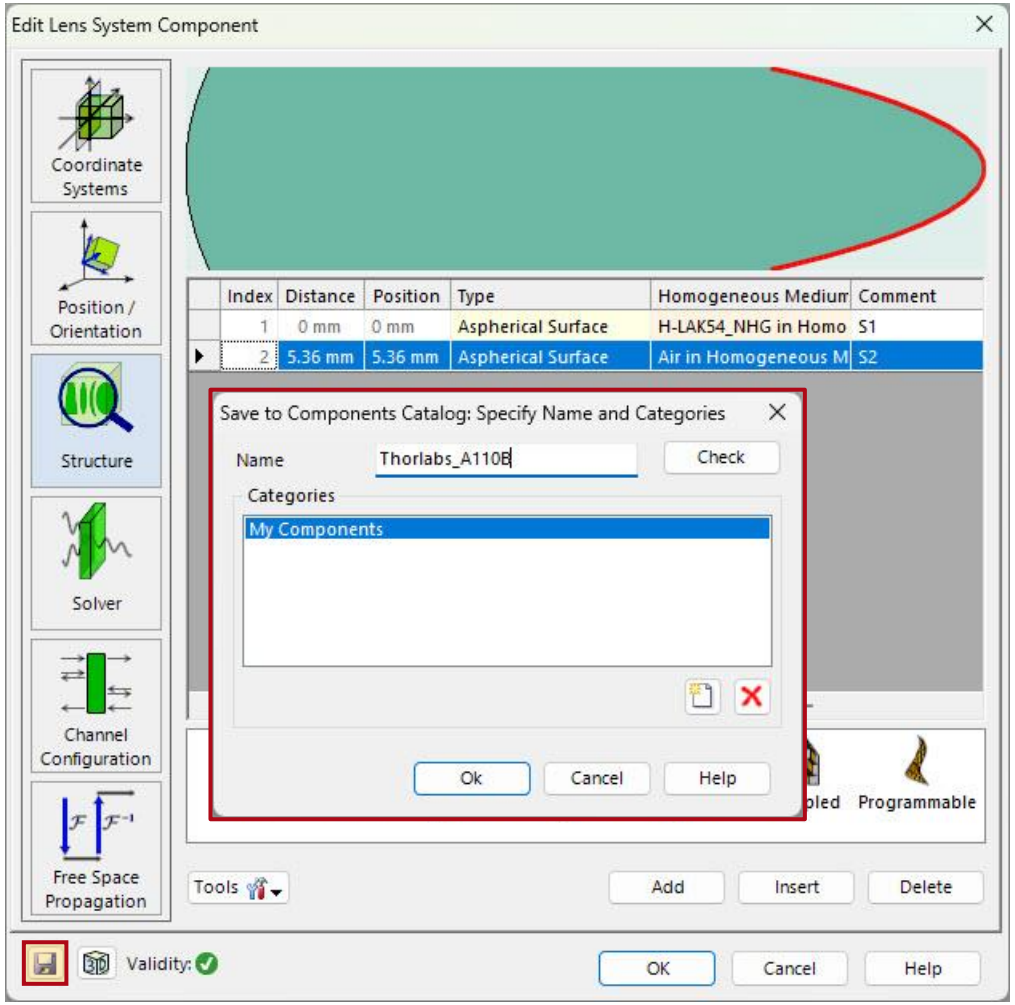
Visualize the Finished Lens

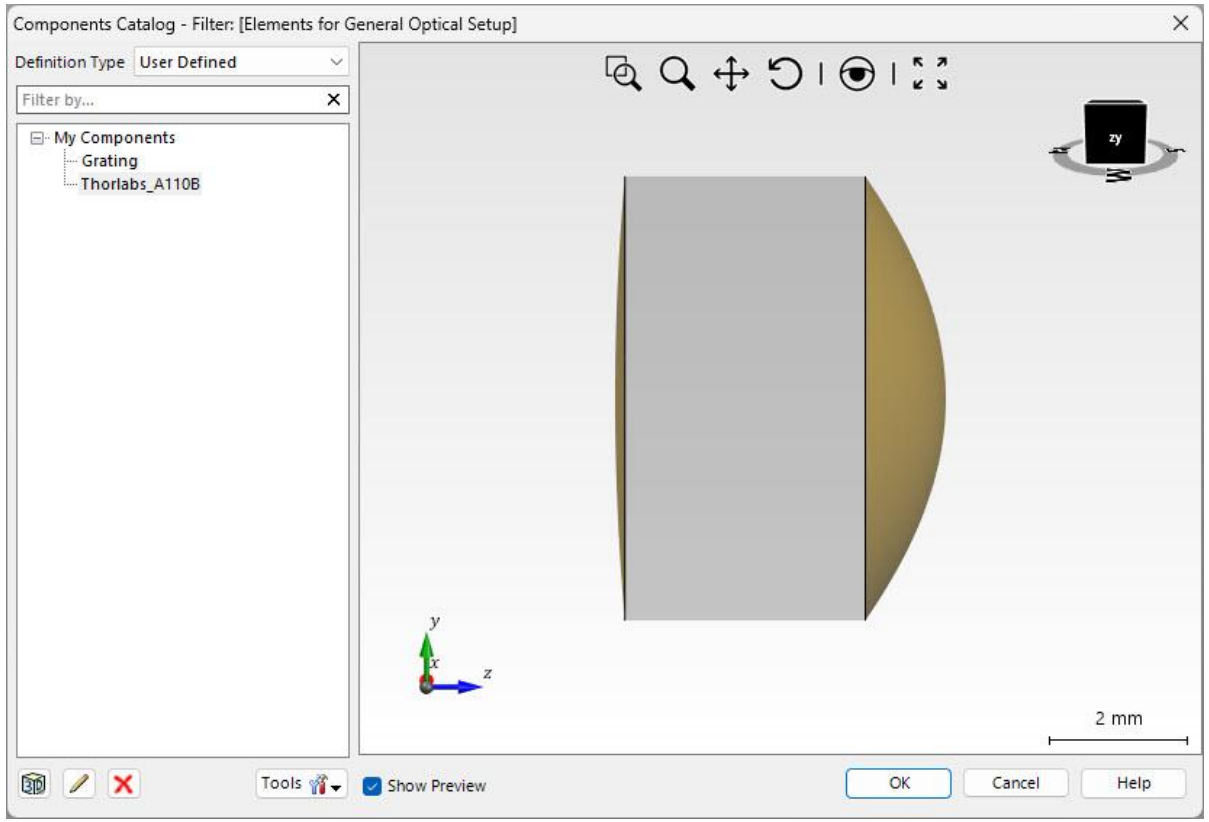




A 3D representation of the defined lens can be visualized here.

Save lens to Catalogue





When using the same component multiple times, you can save it to the *Component Catalogue*, to allow quick access to it in future times.

Document Information

title	Including Lens Systems in the Optical Setup
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software version	2024.1 (Build 1.132)
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further reading	• Import Optical System from Zemax Studio(c)