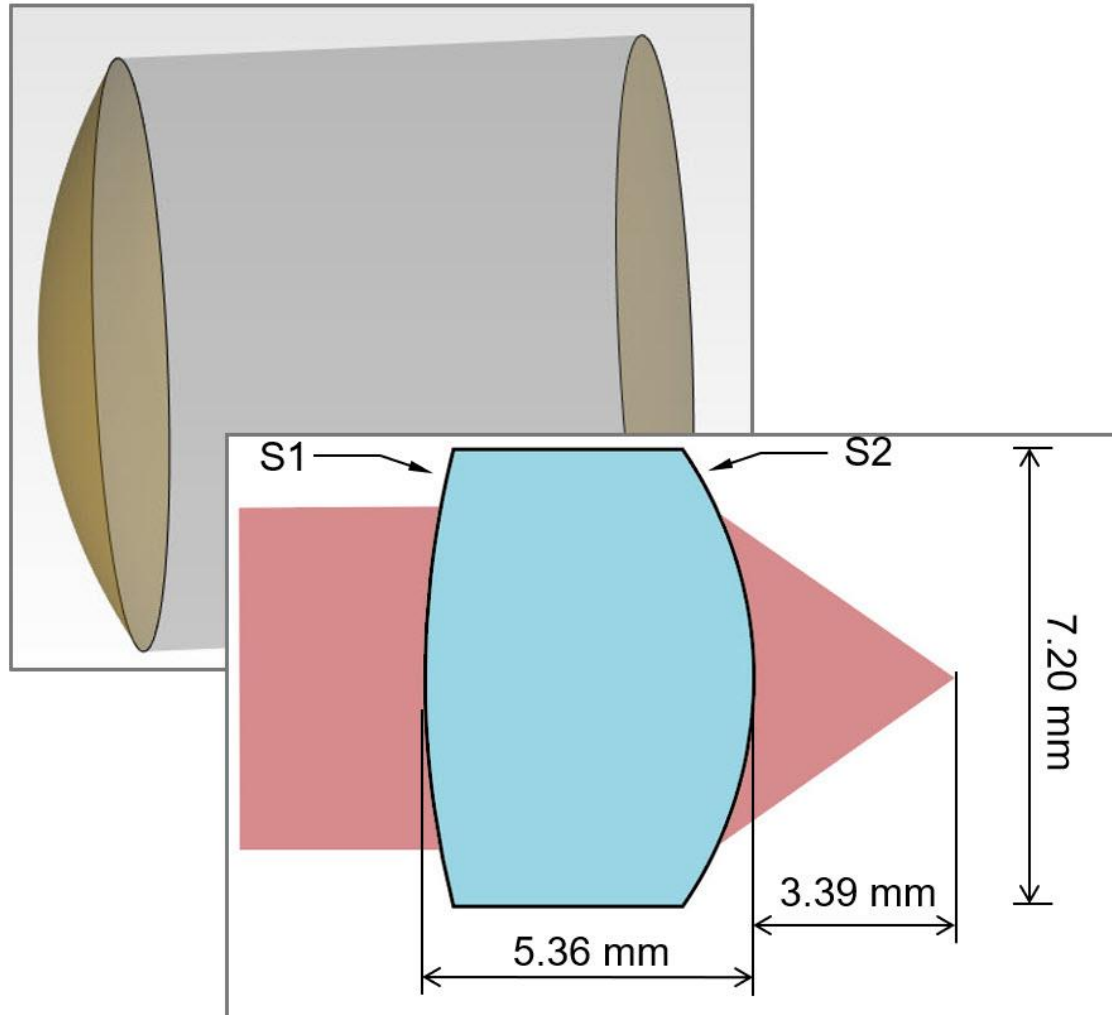


## Including Lens Systems in the Optical Setup

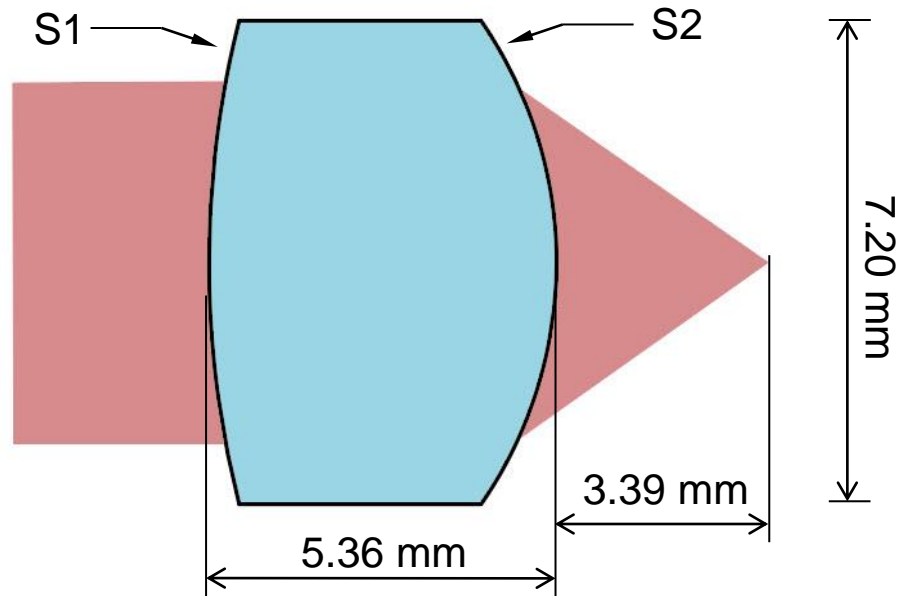
# Abstract



In this document we present a possible workflow 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

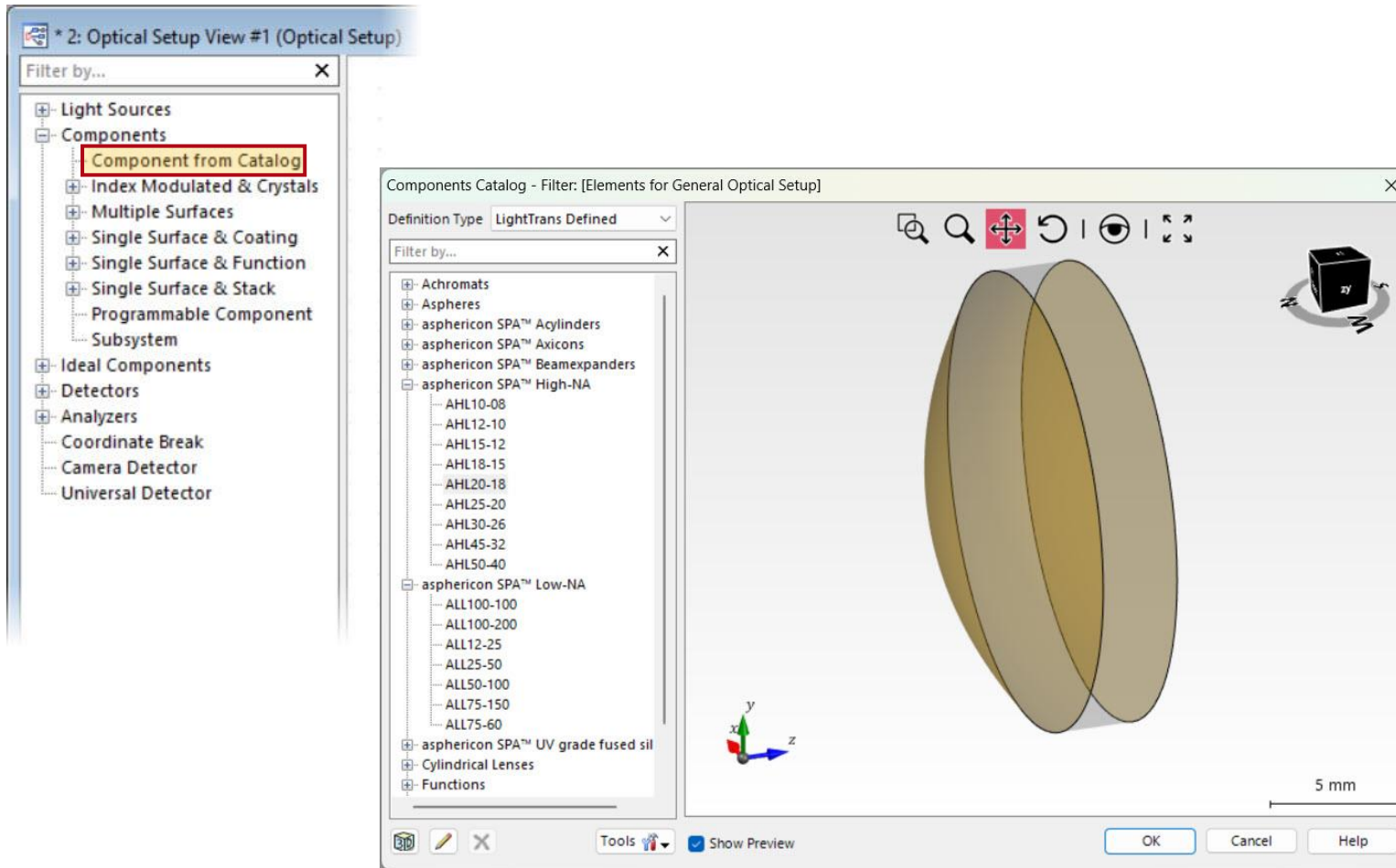


- design wavelength: 780 nm
- material: H-LaK54

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

# I: Selection per Component Catalog

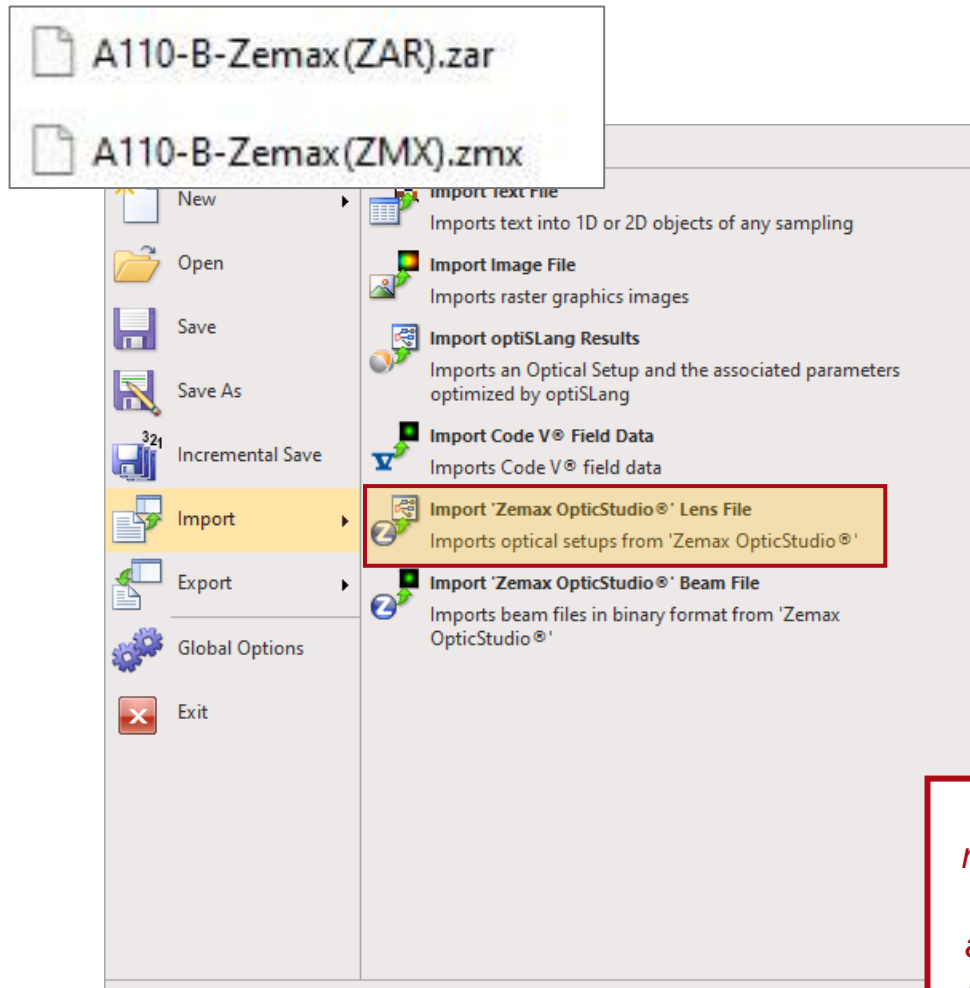
# I: Selection per Catalog



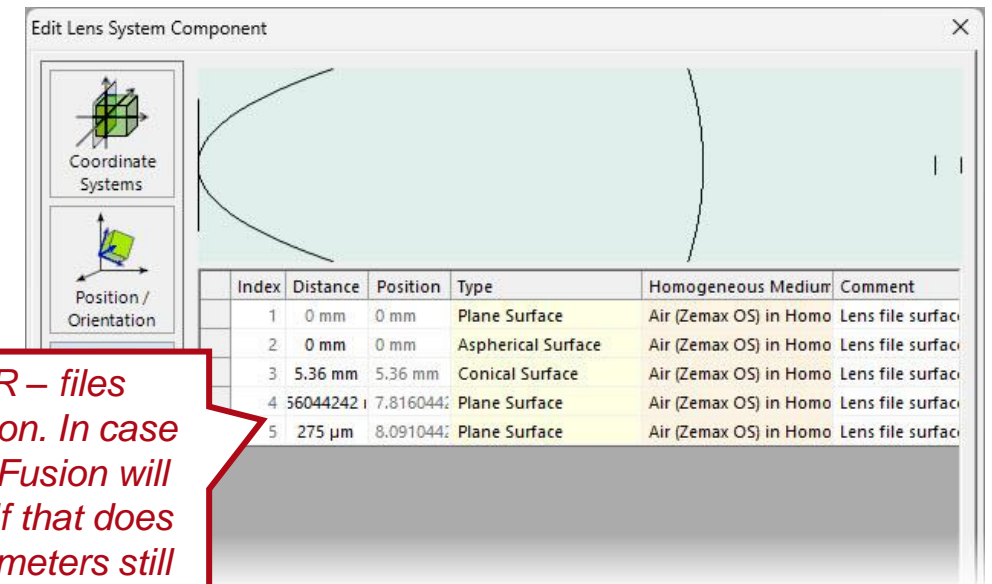
The inbuilt component catalog already offers a selection of various components from different distributors. Once a lens system is defined in VirtualLab Fusion, it also can be saved in the catalog for further uses.

## **II: Import per Zemax-File**

## II: Import per Zemax-File



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

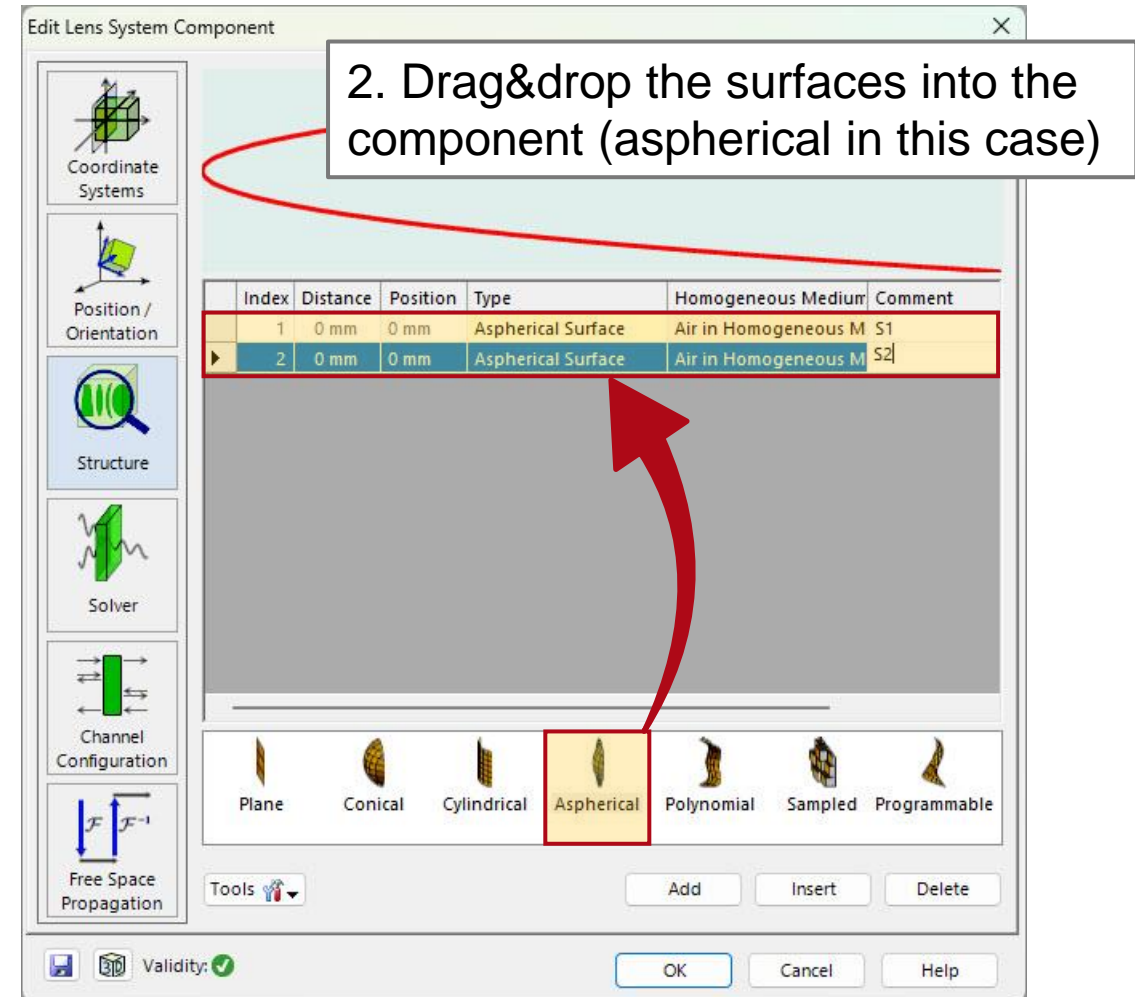
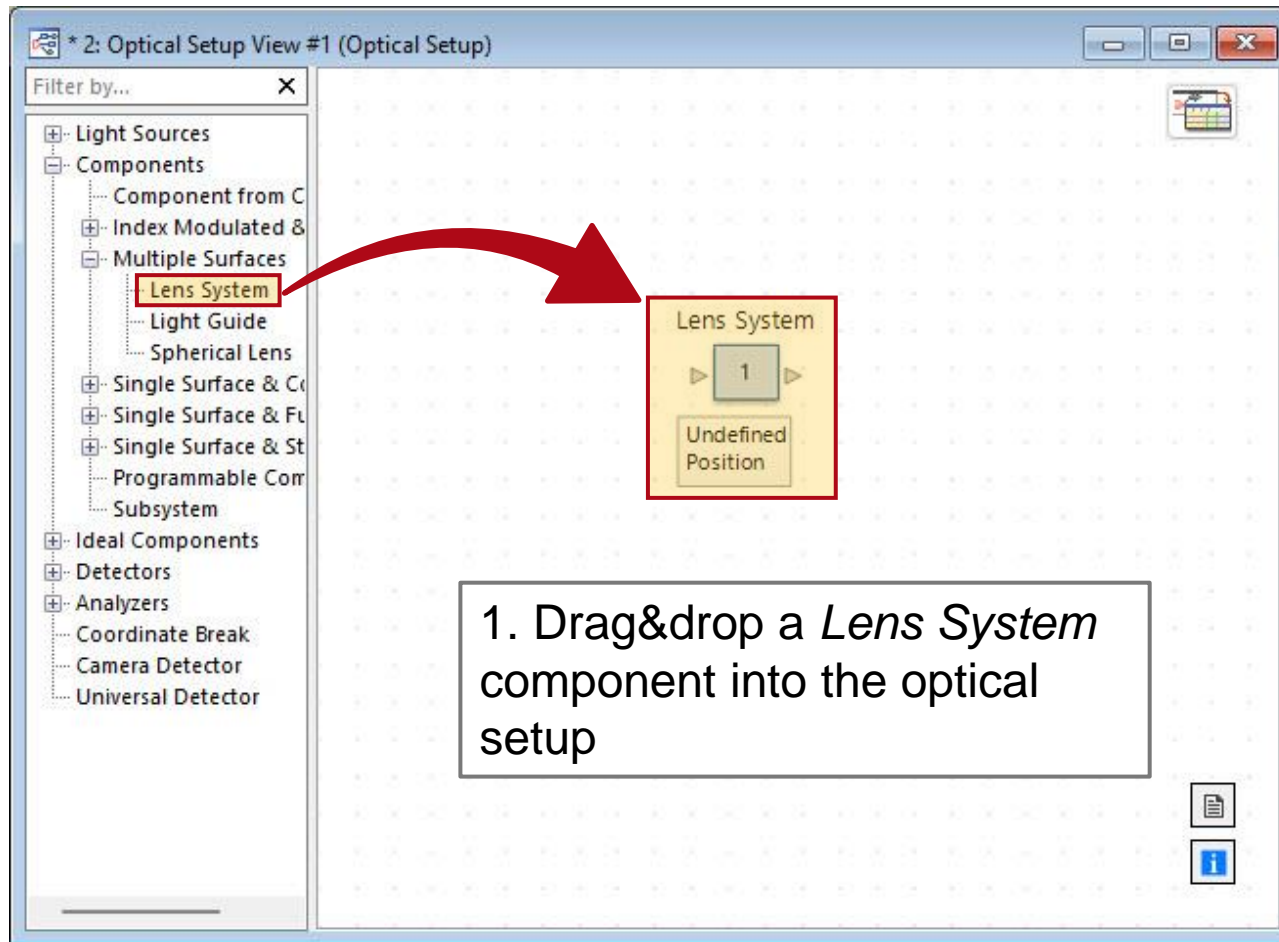


*Note: The import of ZAR – files requires a Zemax installation. In case of ZMX – files, VirtualLab Fusion will ask for a glass database. If that does not exist, the surface parameters still can be imported, but all materials will be set to air.*

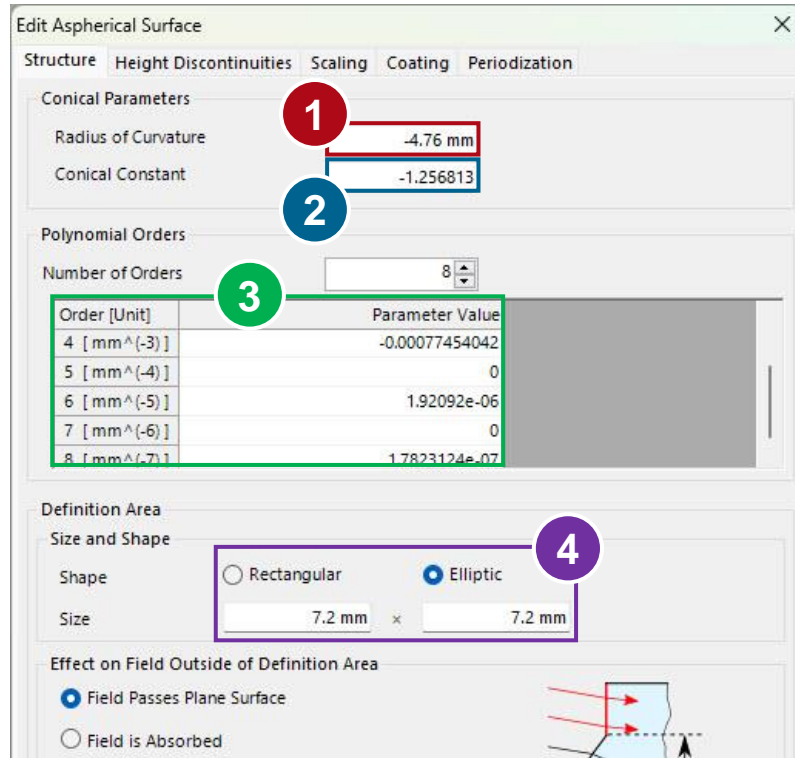
## **III: Definition per Lens System Component**



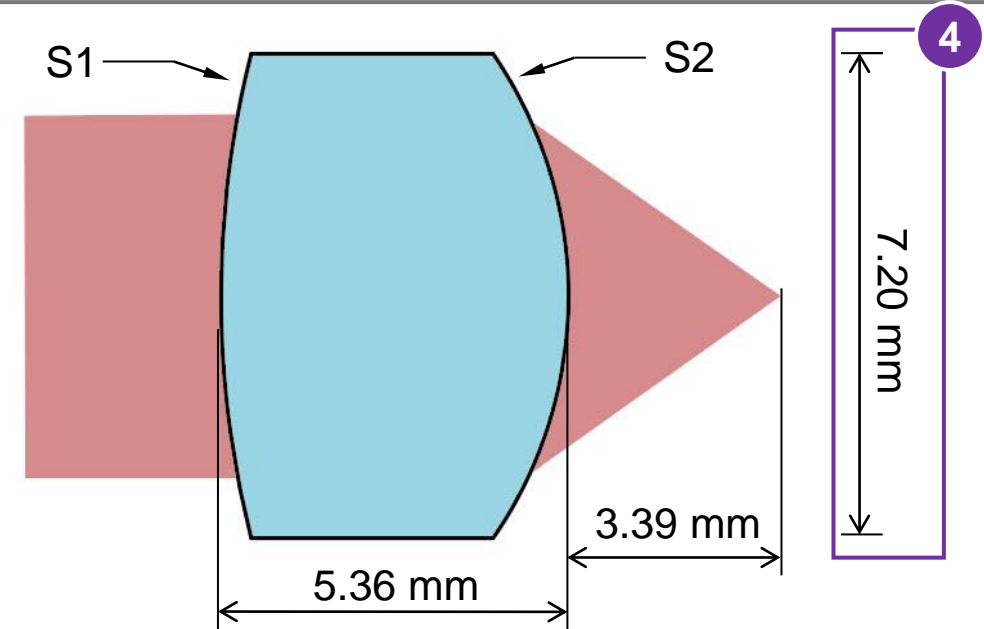
# Specify Lens System Component



# 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 <sup>-1</sup>	A4 / mm <sup>-3</sup>	A6 / mm <sup>-5</sup>	A8 / mm <sup>-7</sup>
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

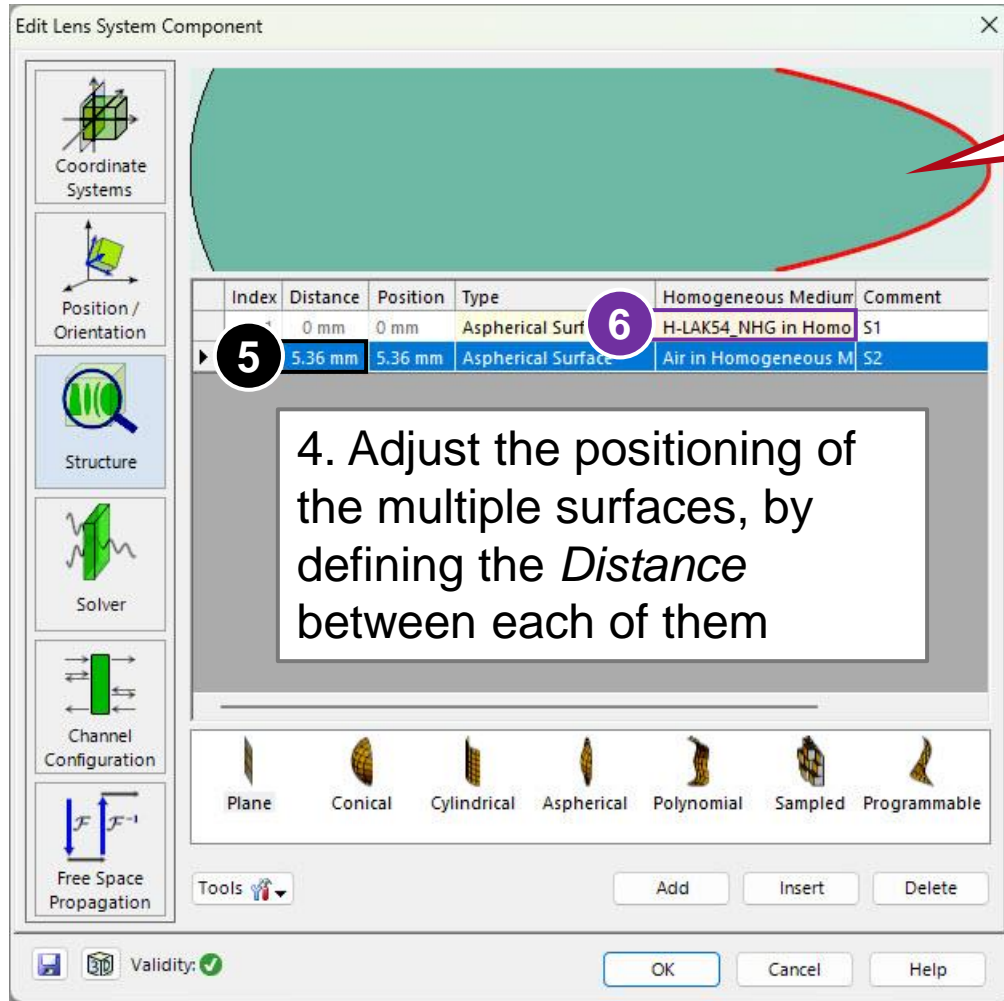
The screenshot illustrates the process of adding a material to a lens system component. The main window, 'Edit Lens System Component', displays a table with the following data:

Index	Distance	Position	Type	Homogeneous Medium	Comment
1	0 mm	0 mm	Aspherical Surface	Air in Homogeneous...	S1
2	5.36 mm	5.36 mm	Aspherical Surface	Air in Homogeneous M...	S2

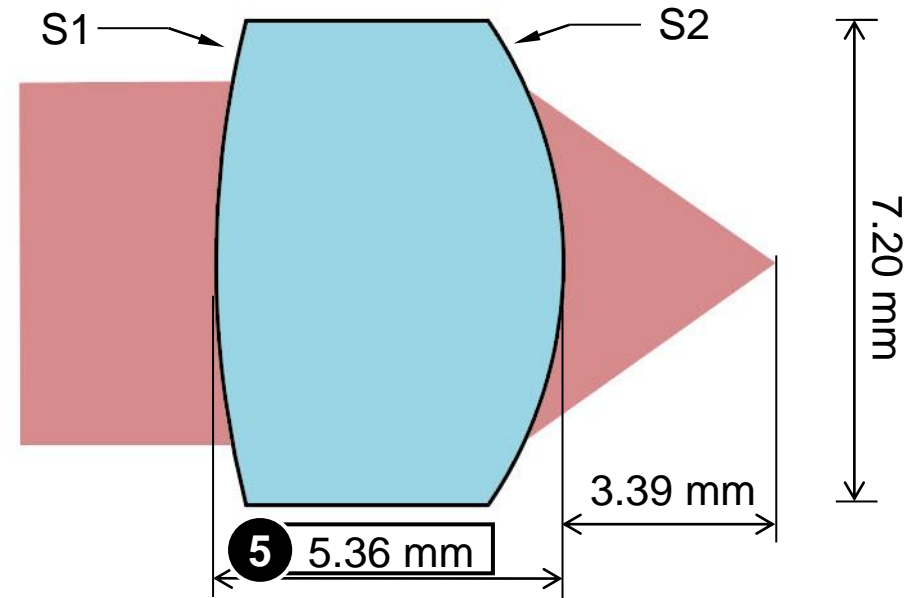
The 'Edit Homogeneous Medium' dialog is open, showing the 'Material' section with 'Air' selected. The 'Materials Catalog' window is open, showing a list of materials. The 'H-LAK54\_NHG' material properties window is open, showing a graph of Relative Refractive Index  $n$  and Absorption Coefficient  $\alpha$  versus Vacuum Wavelength  $\lambda$  [ $\mu\text{m}$ ].

4. Open material catalog and choose the appropriate material

# Add Medium To Lens System Component

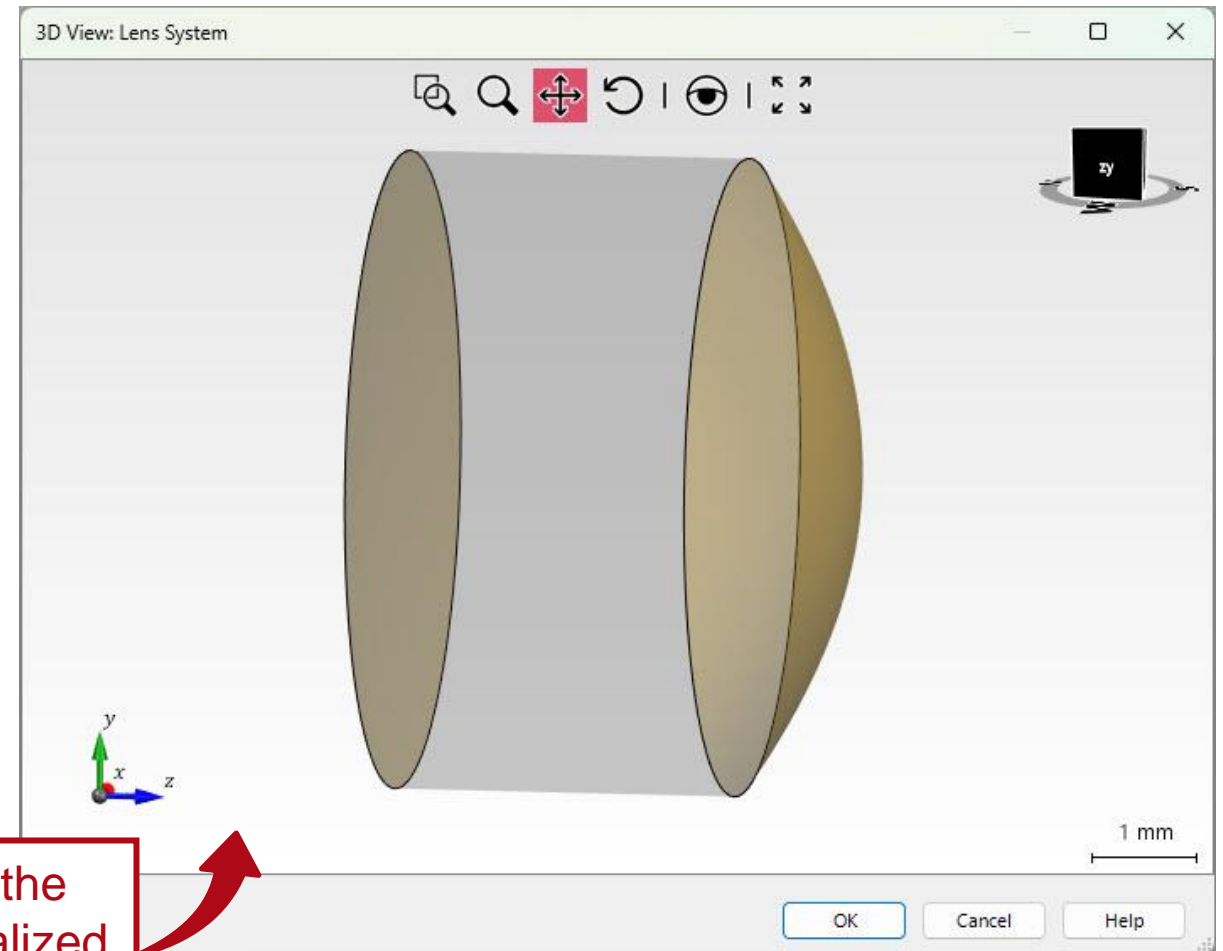
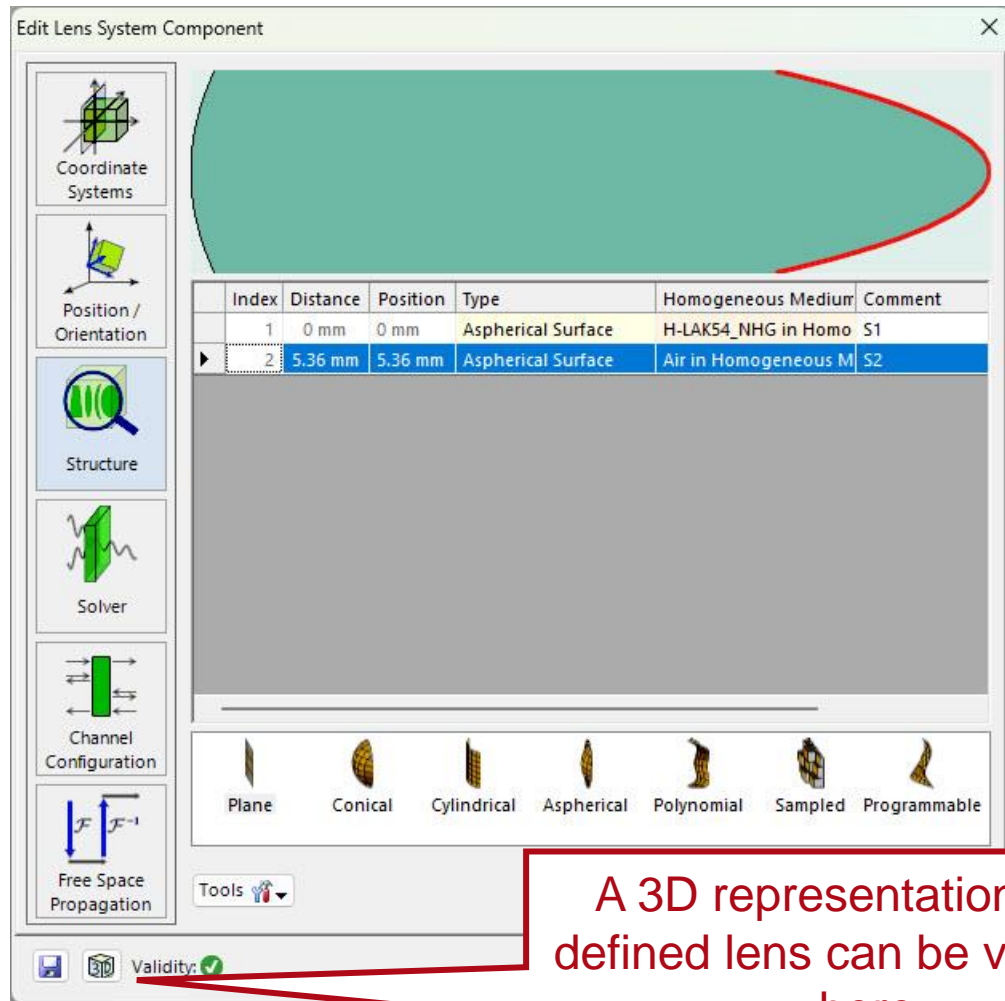


The darker color between the surfaces indicates in general a medium with a higher refractive index.



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

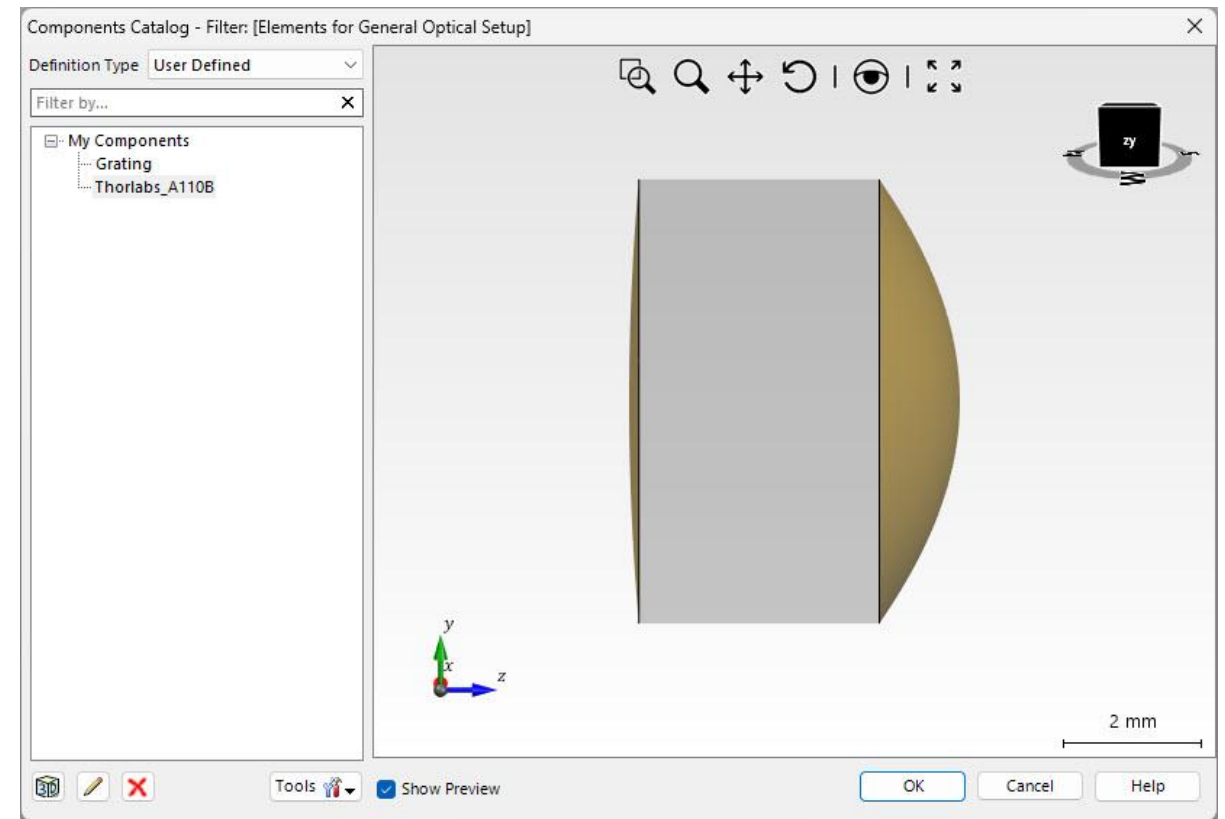
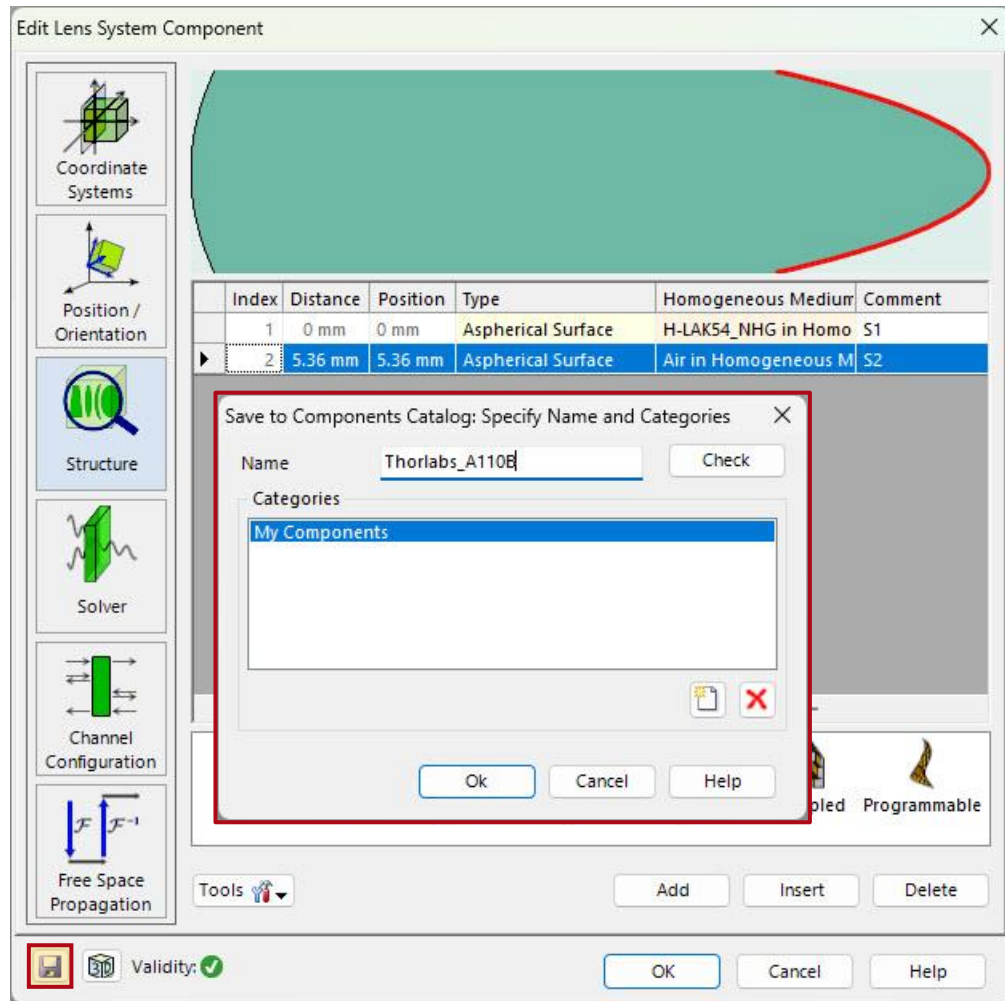
# Visualize the Finished Lens



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

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software edition	VirtualLab Fusion Basic
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category	Feature Use Case
further reading	<ul style="list-style-type: none"><li>• <a href="#"><u>Import Optical System from Zemax Studio(c)</u></a></li></ul>