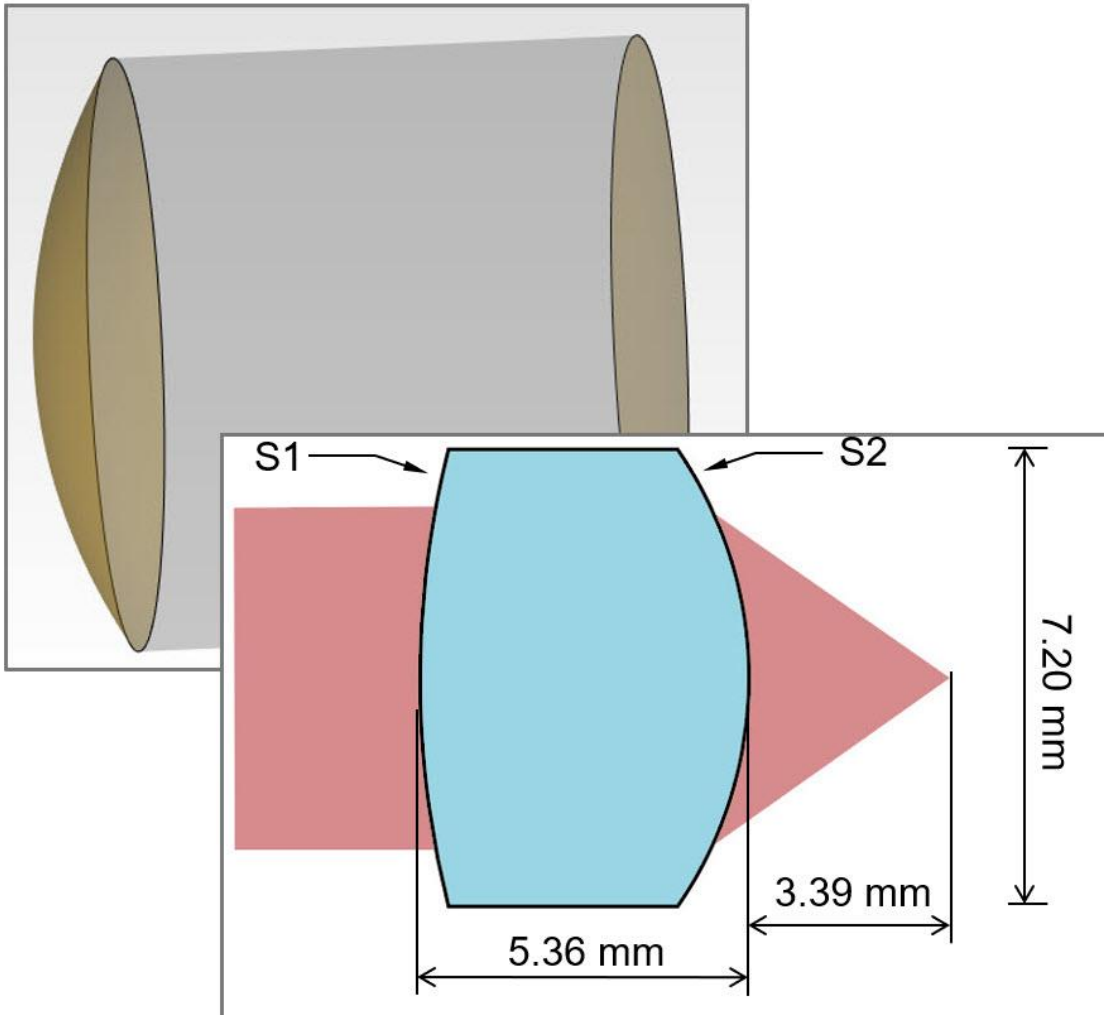


Including Lens Systems in the Optical Setup

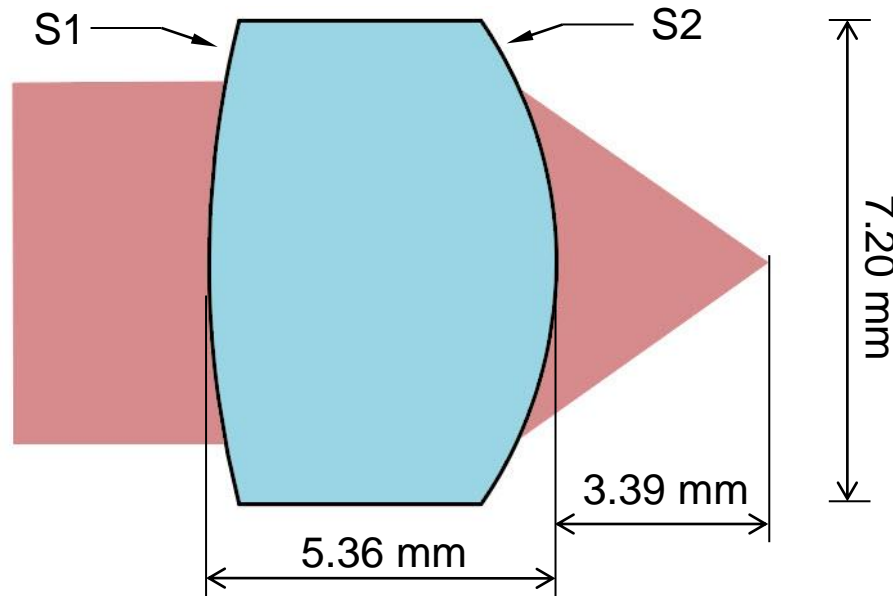
Abstract



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

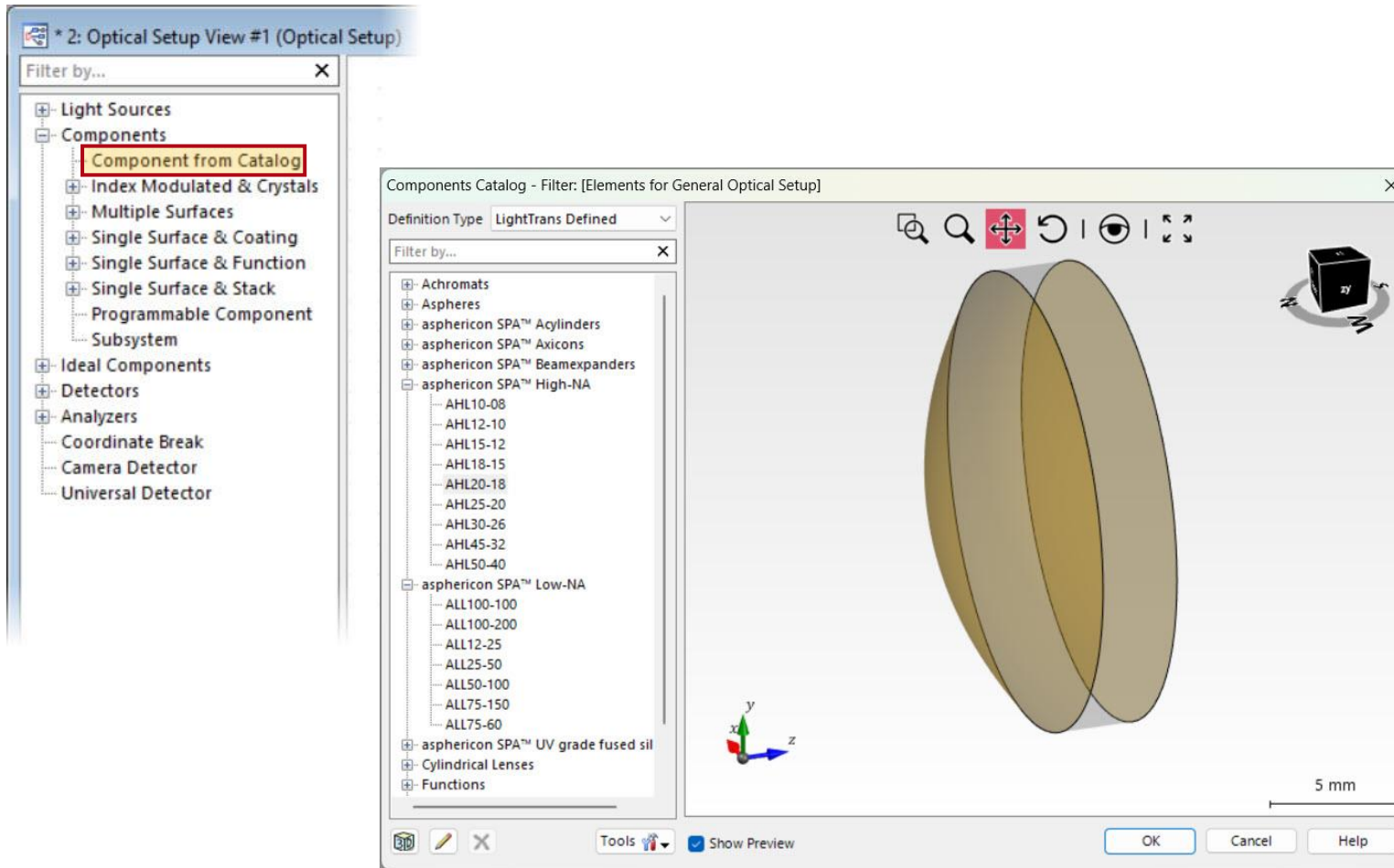


- design wavelength: 780 nm
- material: H-LaK54

	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

I: Selection per Component Catalog

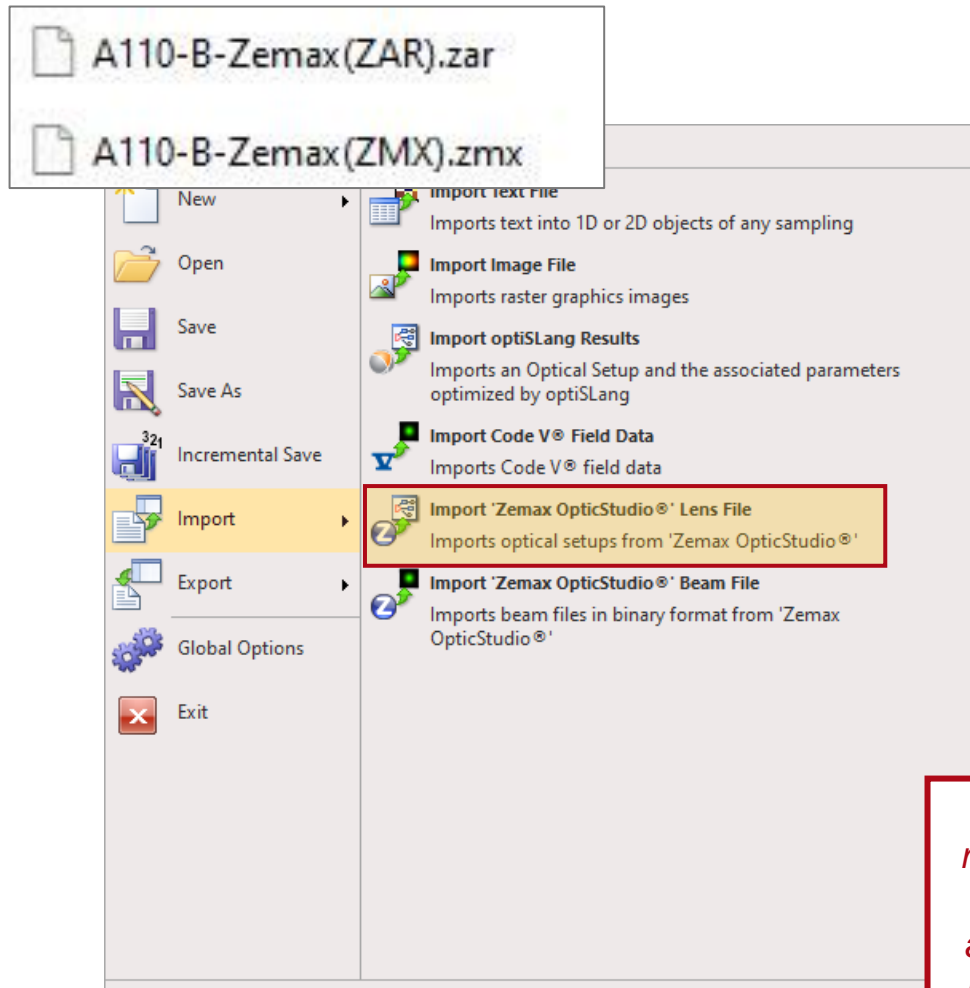
I: Selection per Catalog



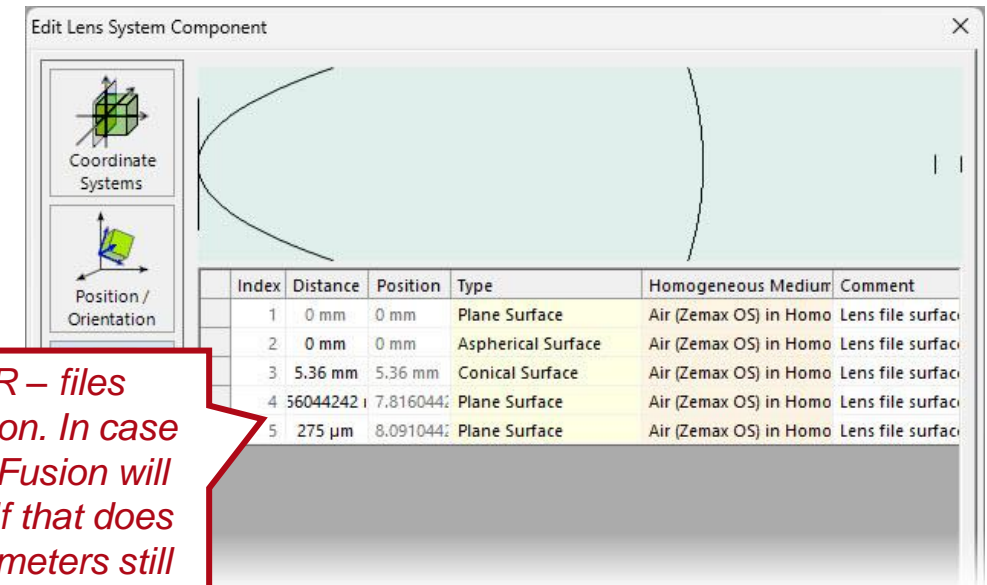
The inbuilt component catalog already offers a selection of various components from different distributors. Once a lens system is defined in VirtualLab Fusion, it also can be saved in the catalog for further uses.

II: Import per Zemax-File

II: Import per Zemax-File



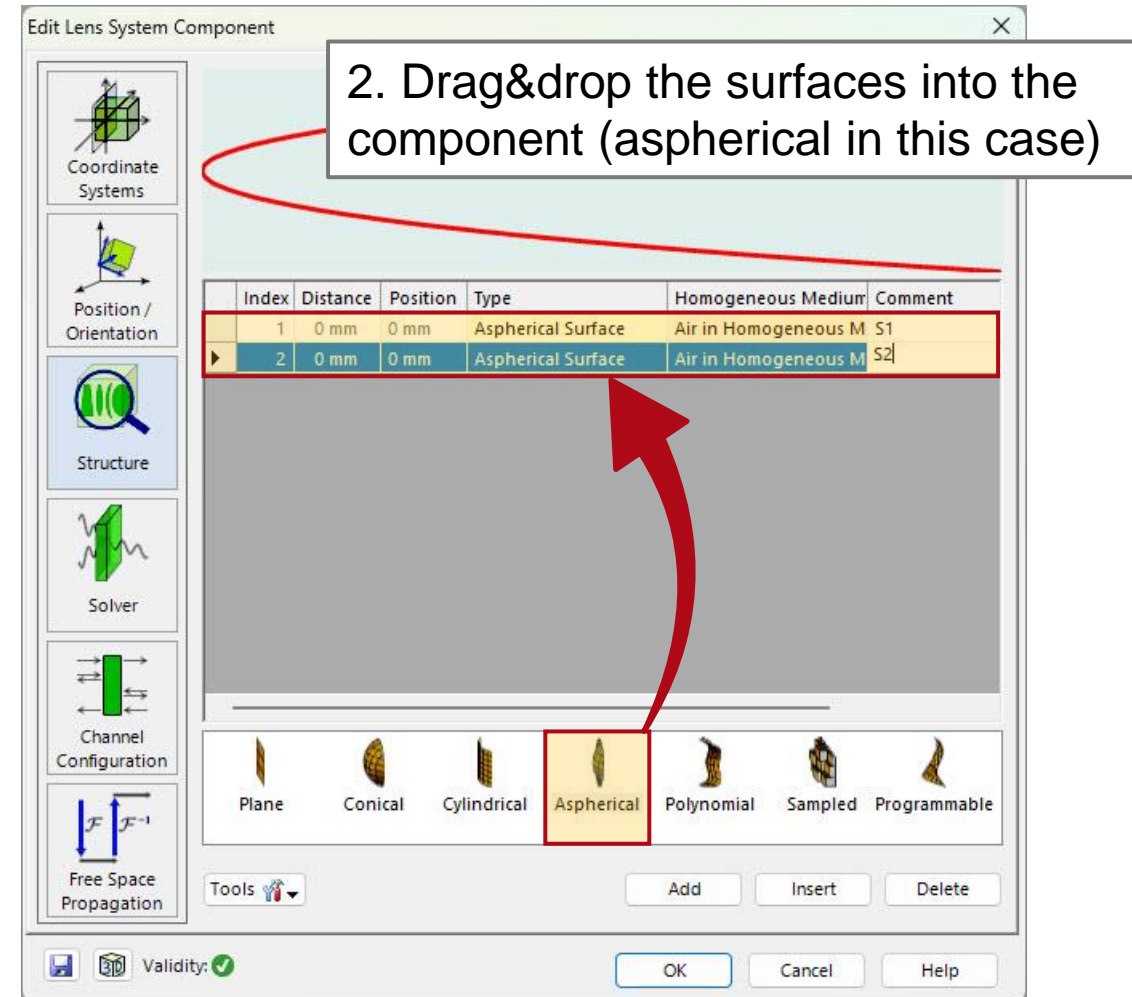
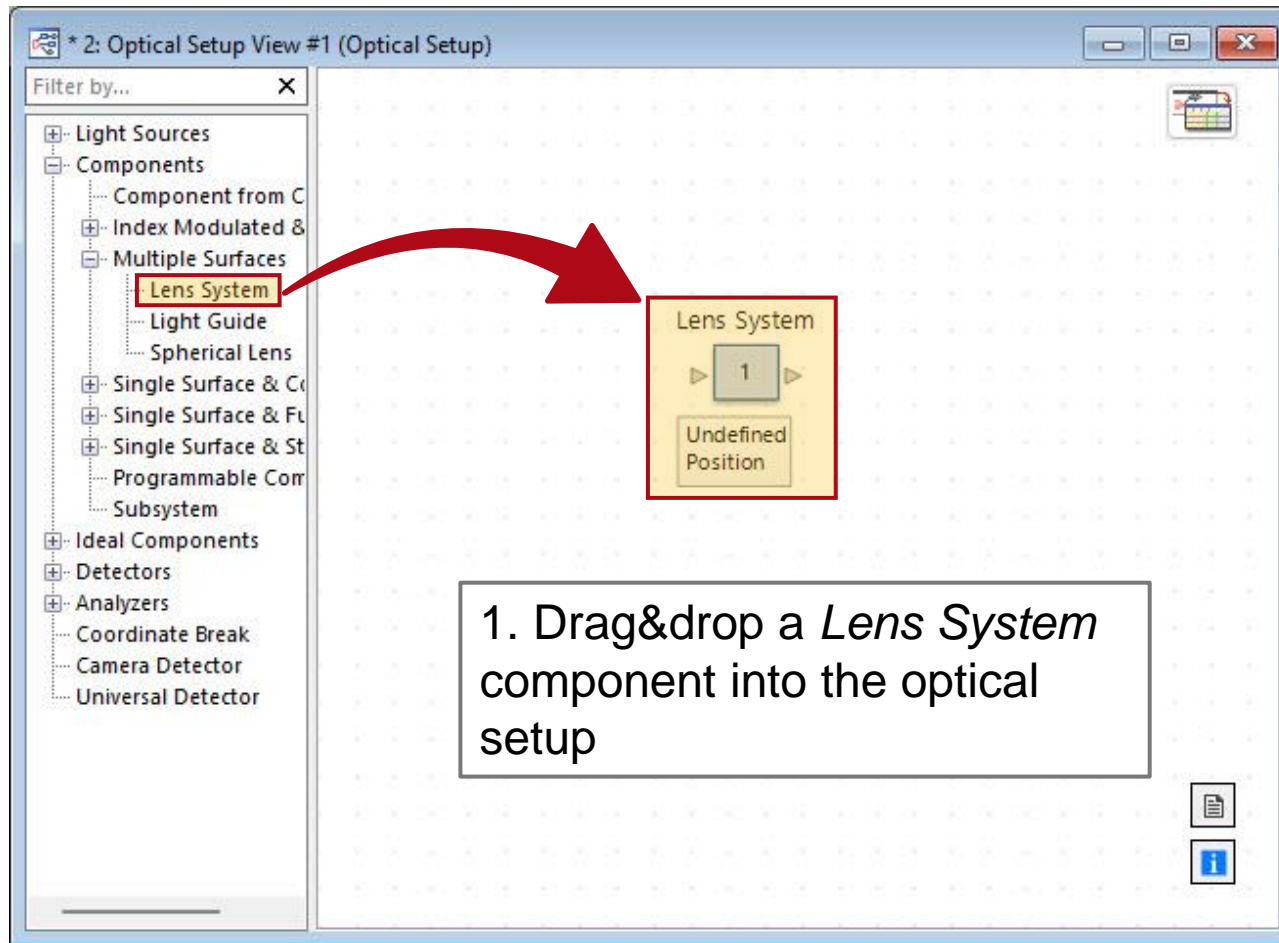
If the manufacturer offers Zemax-Files for the system, they can be used to import it into VirtualLab Fusion. For in in-depth guide on how to import Zemax-files, please see: [Import Optical System from Zemax Studio\(c\)](#)



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

Edit Aspherical Surface

Structure Height Discontinuities Scaling Coating Periodization

Conical Parameters

Radius of Curvature **1** -4.76 mm

Conical Constant **2** -1.256813

Polynomial Orders

Number of Orders **3** 8

Order [Unit]	Parameter Value
4 [mm ⁻³]	-0.00077454042
5 [mm ⁻⁴]	0
6 [mm ⁻⁵]	1.92092e-06
7 [mm ⁻⁶]	0
8 [mm ⁻⁷]	1.7823124e-07

Definition Area

Size and Shape

Shape ☐ Rectangular ☒ Elliptic **4**

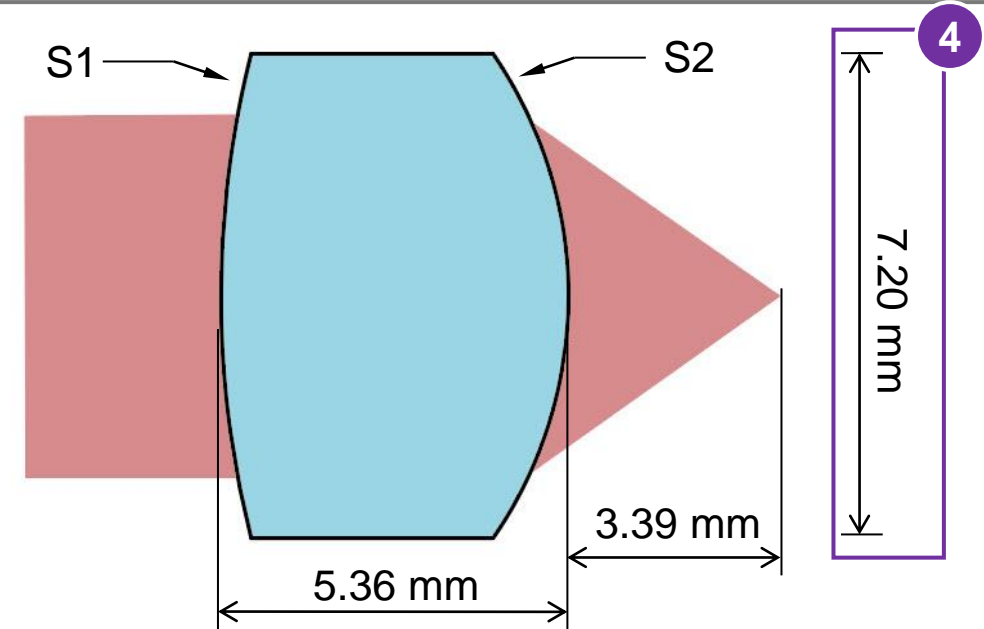
Size 7.2 mm × 7.2 mm

Effect on Field Outside of Definition Area

☒ Field Passes Plane Surface

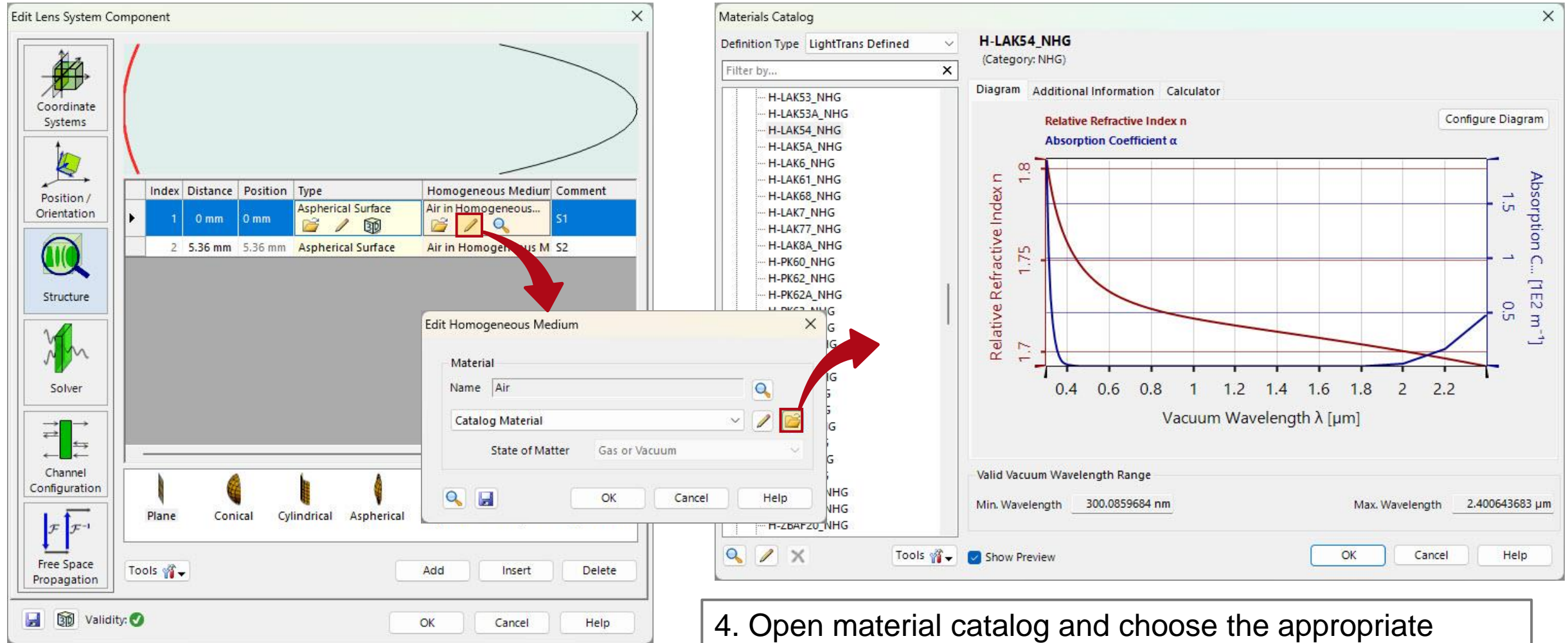
☐ Field is Absorbed

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



Edit Lens System Component

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	

Edit Homogeneous Medium

Material Name: Air

Catalog Material: [Dropdown]

State of Matter: Gas or Vacuum

Materials Catalog

Definition Type: LightTrans Defined

Filter by...

H-LAK54_NHG
(Category: NHG)

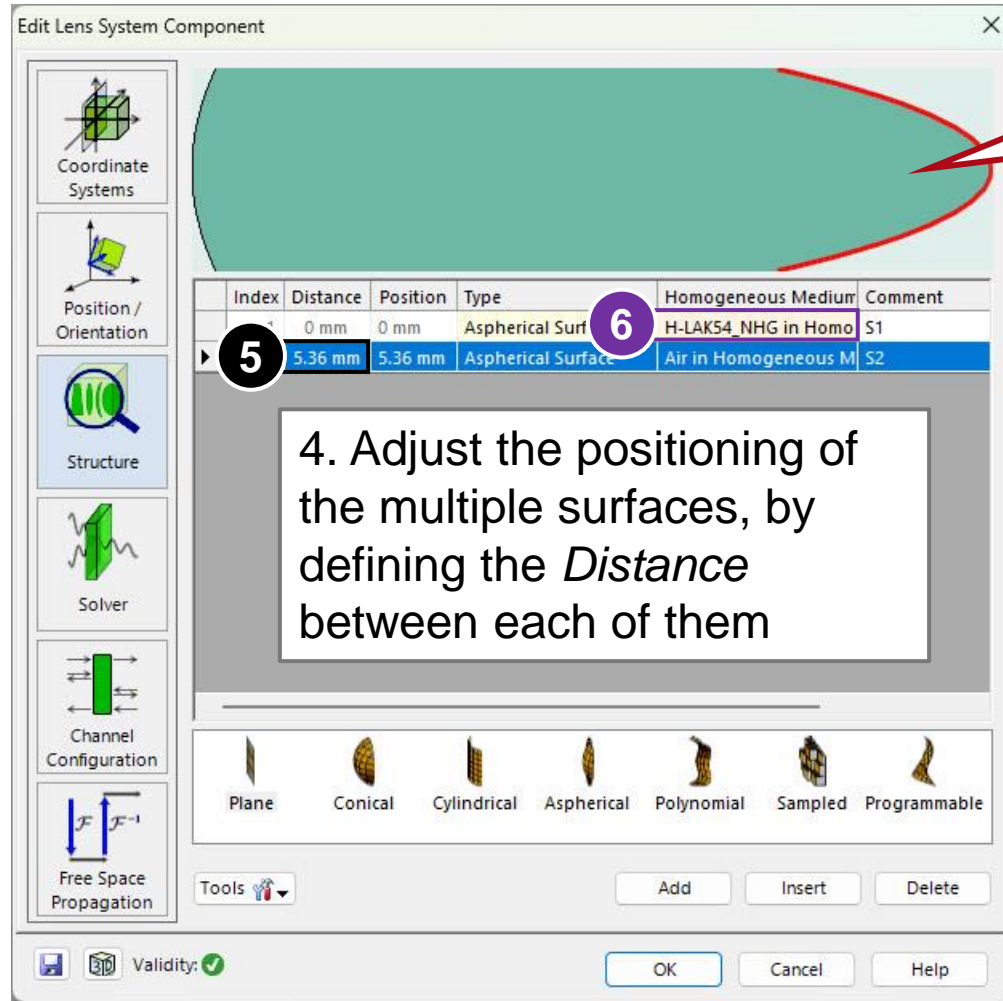
Diagram Additional Information Calculator

Relative Refractive Index n
Absorption Coefficient α

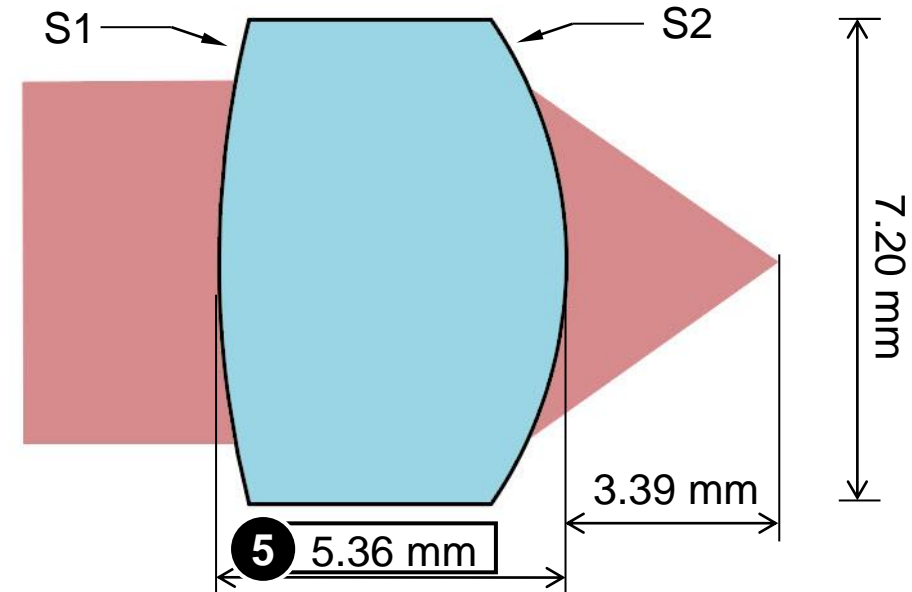
Valid Vacuum Wavelength Range
Min. Wavelength: 300.0859684 nm
Max. Wavelength: 2.400643683 μm

4. Open material catalog and choose the appropriate material

Add Medium To Lens System Component

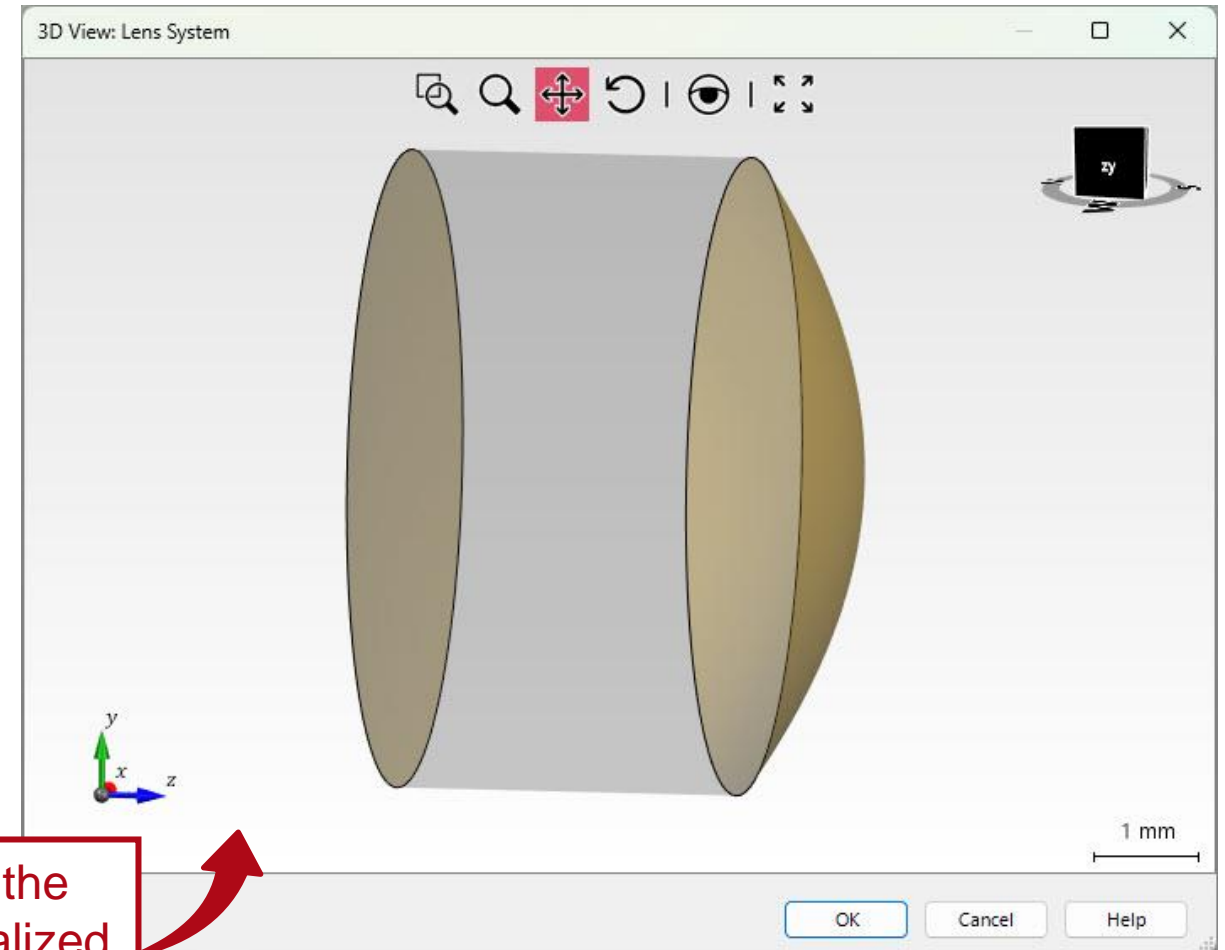
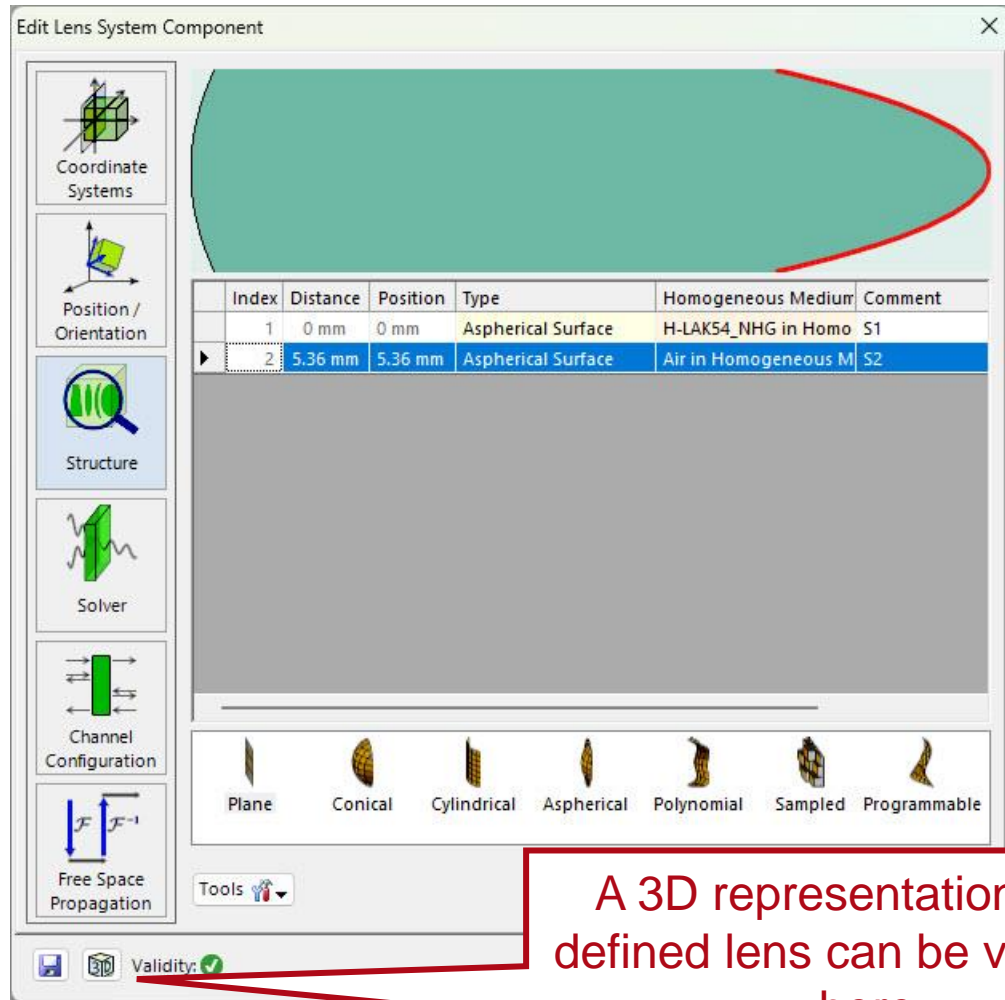


The darker color between the surfaces indicates in general a medium with a higher refractive index.



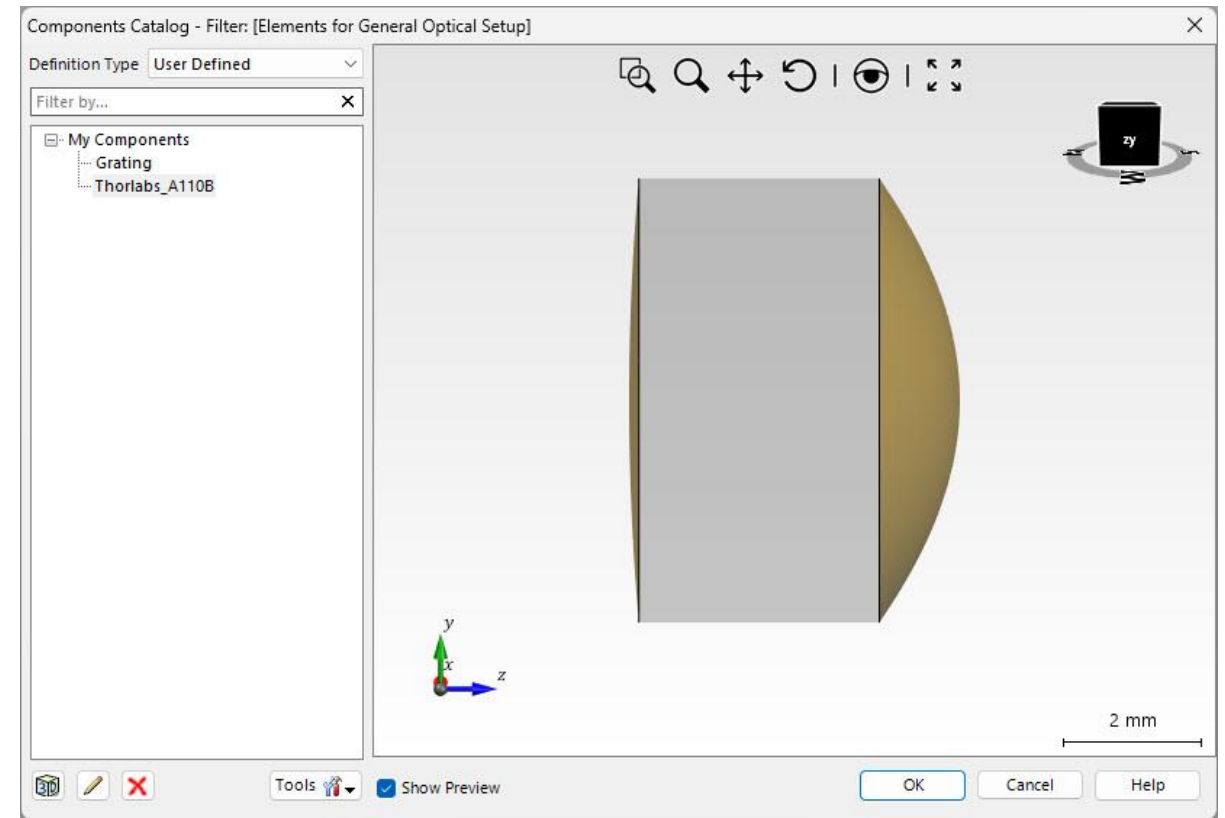
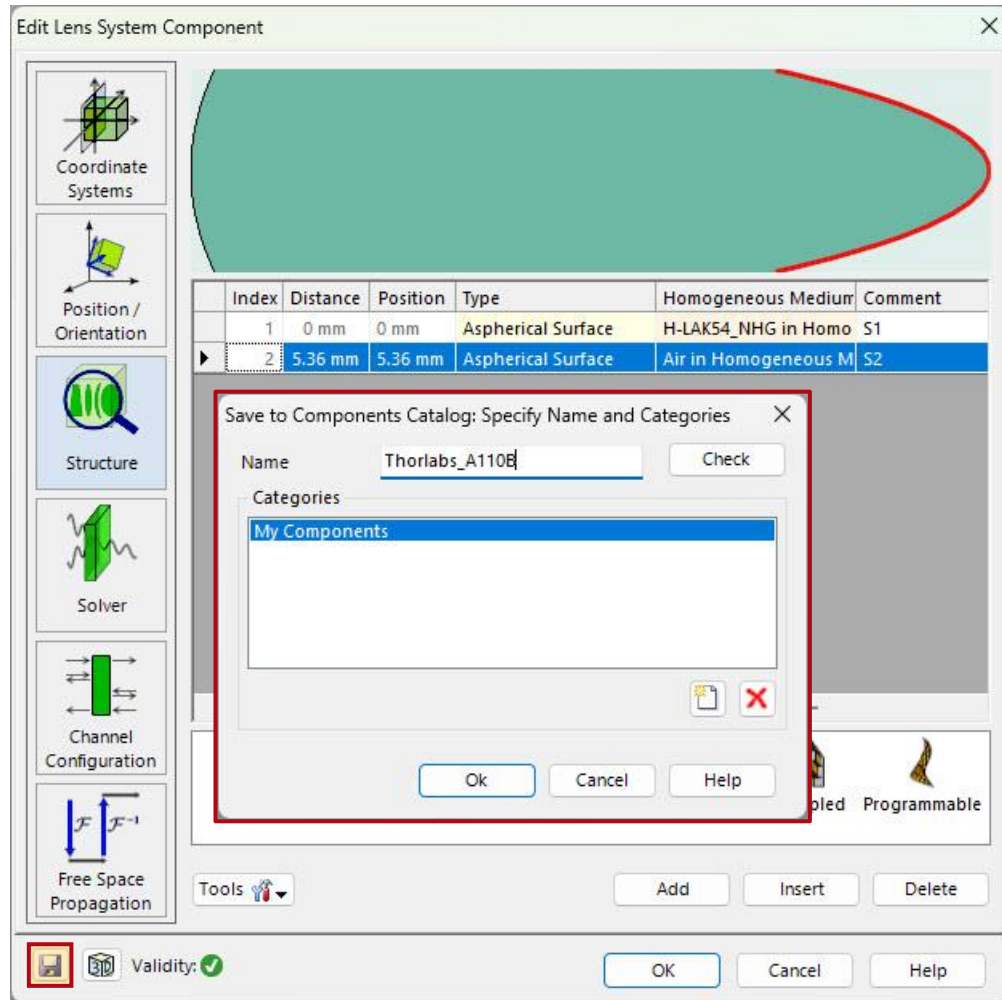
- design wavelength: 780 nm
- material: H-LaK54 6

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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required packages	-
software version	2024.1 (Build 1.132)
category	Feature Use Case
further reading	<ul style="list-style-type: none">• <u>Import Optical System from Zemax Studio(c)</u>