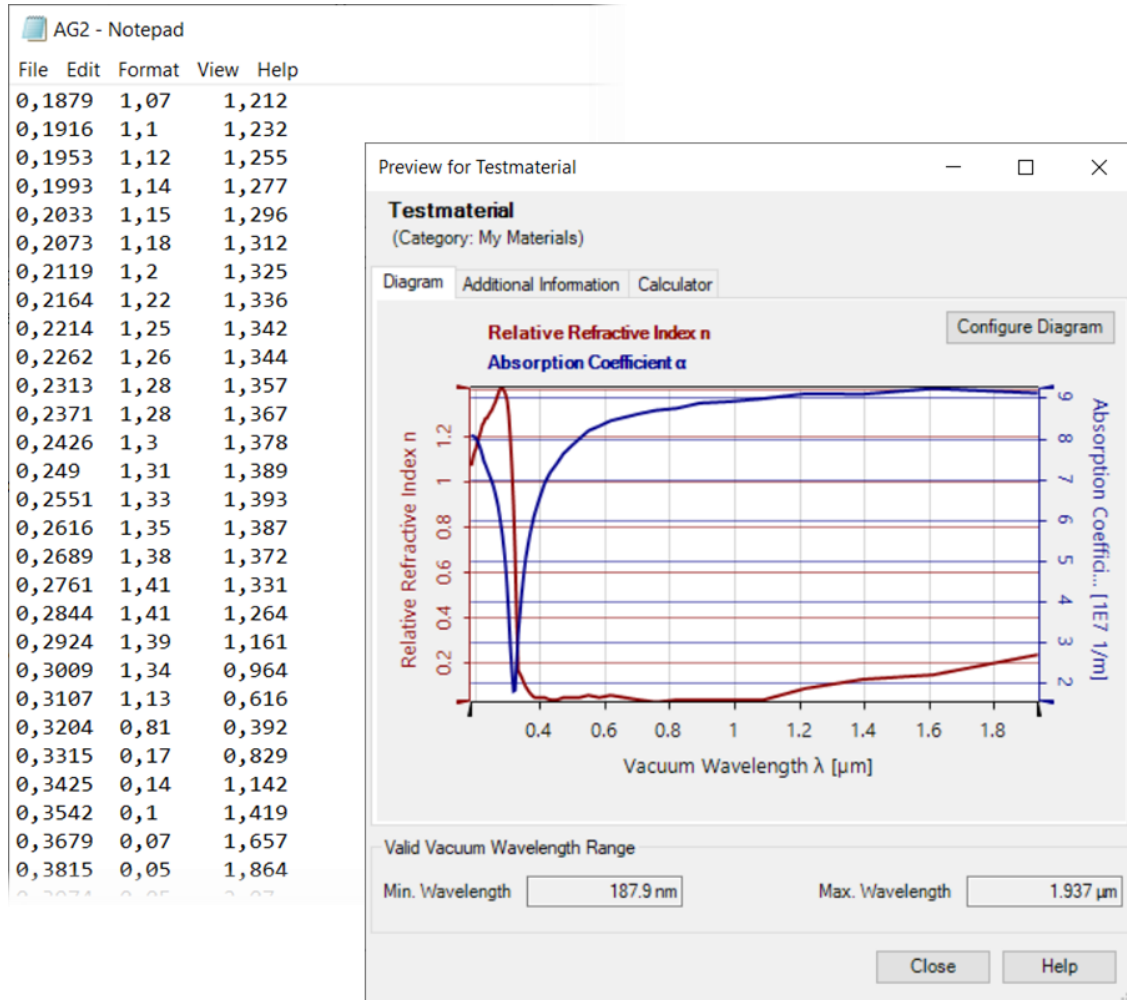


Import Material Data into VirtualLab Fusion

Abstract



To model an optical system accurately, it is essential to use precise material properties. In case of thin layers or more complex materials, the actual refractive index may differ from the values found in literature. Hence it is required to measure the complex refractive index of the material and import the data into VirtualLab Fusion. The workflow to import complex material data is shown in this document.

Material Data Format

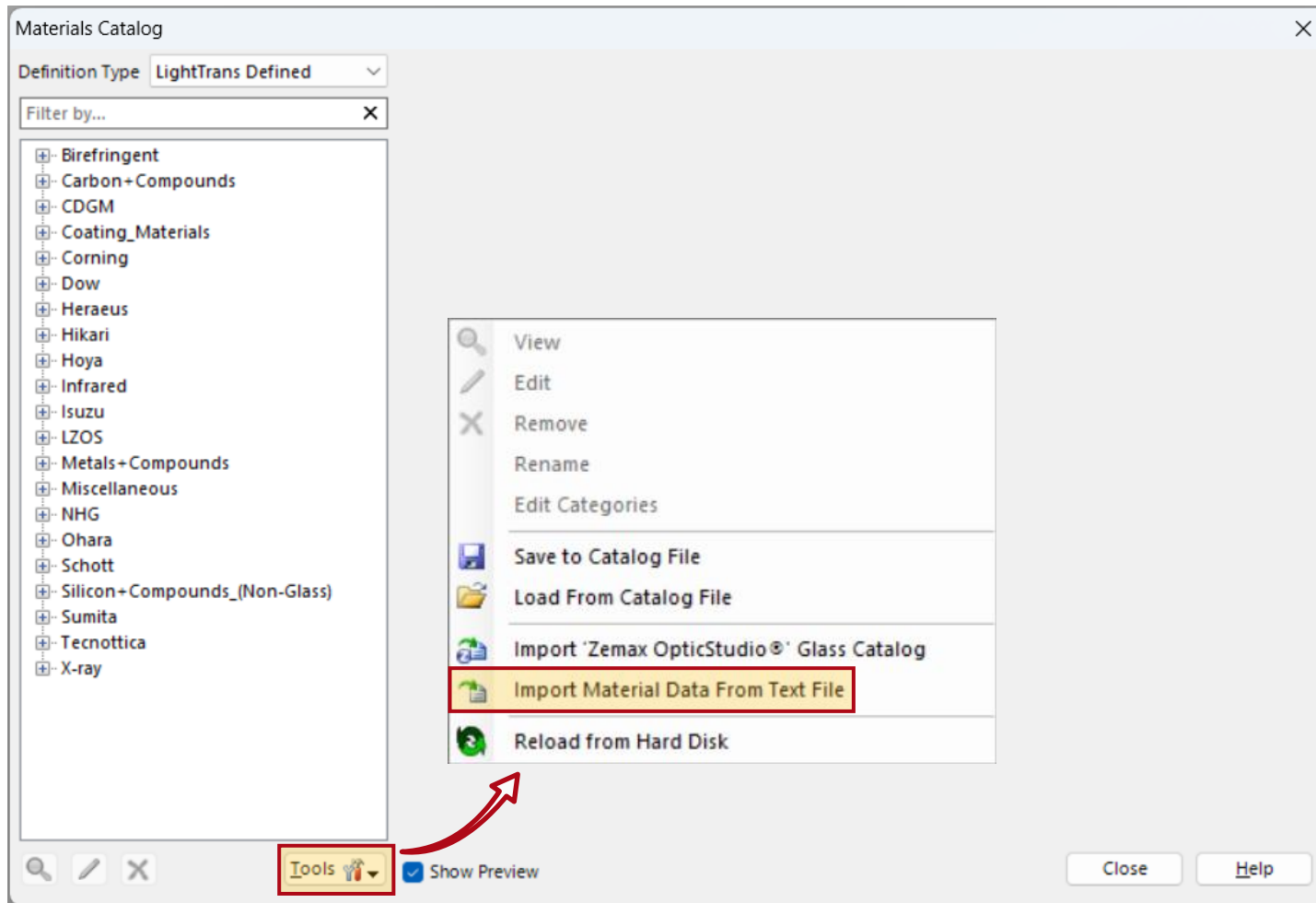


| File | Edit | Format | View | Help |
|--------|------|--------|------|------|
| 0,1879 | 1,07 | 1,212 | | |
| 0,1916 | 1,1 | 1,232 | | |
| 0,1953 | 1,12 | 1,255 | | |
| 0,1993 | 1,14 | 1,277 | | |
| 0,2033 | 1,15 | 1,296 | | |
| 0,2073 | 1,18 | 1,312 | | |
| 0,2119 | 1,2 | 1,325 | | |
| 0,2164 | 1,22 | 1,336 | | |
| 0,2214 | 1,25 | 1,342 | | |
| 0,2262 | 1,26 | 1,344 | | |
| 0,2313 | 1,28 | 1,357 | | |
| 0,2371 | 1,2 | 1,367 | | |
| 0,2426 | 1,3 | 1,378 | | |
| 0,249 | 1,31 | 1,389 | | |
| 0,2551 | 1,33 | 1,393 | | |
| 0,2616 | 1,35 | 1,387 | | |
| 0,2689 | 1,38 | 1,372 | | |
| 0,2761 | 1,41 | 1,331 | | |
| 0,2844 | 1,41 | 1,264 | | |
| 0,2924 | 1,39 | 1,161 | | |
| 0,3009 | 1,34 | 0,964 | | |
| 0,3107 | 1,13 | 0,616 | | |
| 0,3204 | 0,81 | 0,392 | | |
| 0,3315 | 0,17 | 0,829 | | |

For the import wizard, material data could be written using the format shown on the left and include the following information:

- (1) ascending wavelength λ
- (2) refractive index n
- (3) absorption coefficient κ

Import via Wizard



In the *Materials Catalog*, open the import wizard and select the text file containing the material data.

Interpret Text Strings as Numbers

The image shows a Notepad window on the left with a text file named 'AG2.txt' containing a table of data. The data is as follows:

| | | |
|--------|------|-------|
| 0,1879 | 1,07 | 1,212 |
| 0,1916 | 1,1 | 1,232 |
| 0,1953 | 1,12 | 1,255 |
| 0,1993 | 1,14 | 1,277 |
| 0,2033 | 1,15 | 1,296 |
| 0,2073 | 1,18 | 1,312 |
| 0,2119 | 1,2 | 1,325 |
| 0,2164 | 1,22 | 1,336 |
| 0,2214 | 1,25 | 1,342 |
| 0,2262 | 1,26 | 1,344 |
| 0,2313 | 1,28 | 1,357 |
| 0,2371 | 1,28 | 1,367 |
| 0,2426 | 1,3 | 1,378 |
| 0,249 | 1,31 | 1,389 |
| 0,2551 | 1,33 | 1,393 |
| 0,2616 | 1,35 | 1,387 |
| 0,2689 | 1,38 | 1,372 |
| 0,2761 | 1,41 | 1,331 |
| 0,2844 | 1,41 | 1,264 |
| 0,2924 | 1,39 | 1,161 |
| 0,3009 | 1,34 | 0,964 |
| 0,3107 | 1,13 | 0,616 |
| 0,3204 | 0,81 | 0,392 |
| 0,3315 | 0,17 | 0,829 |

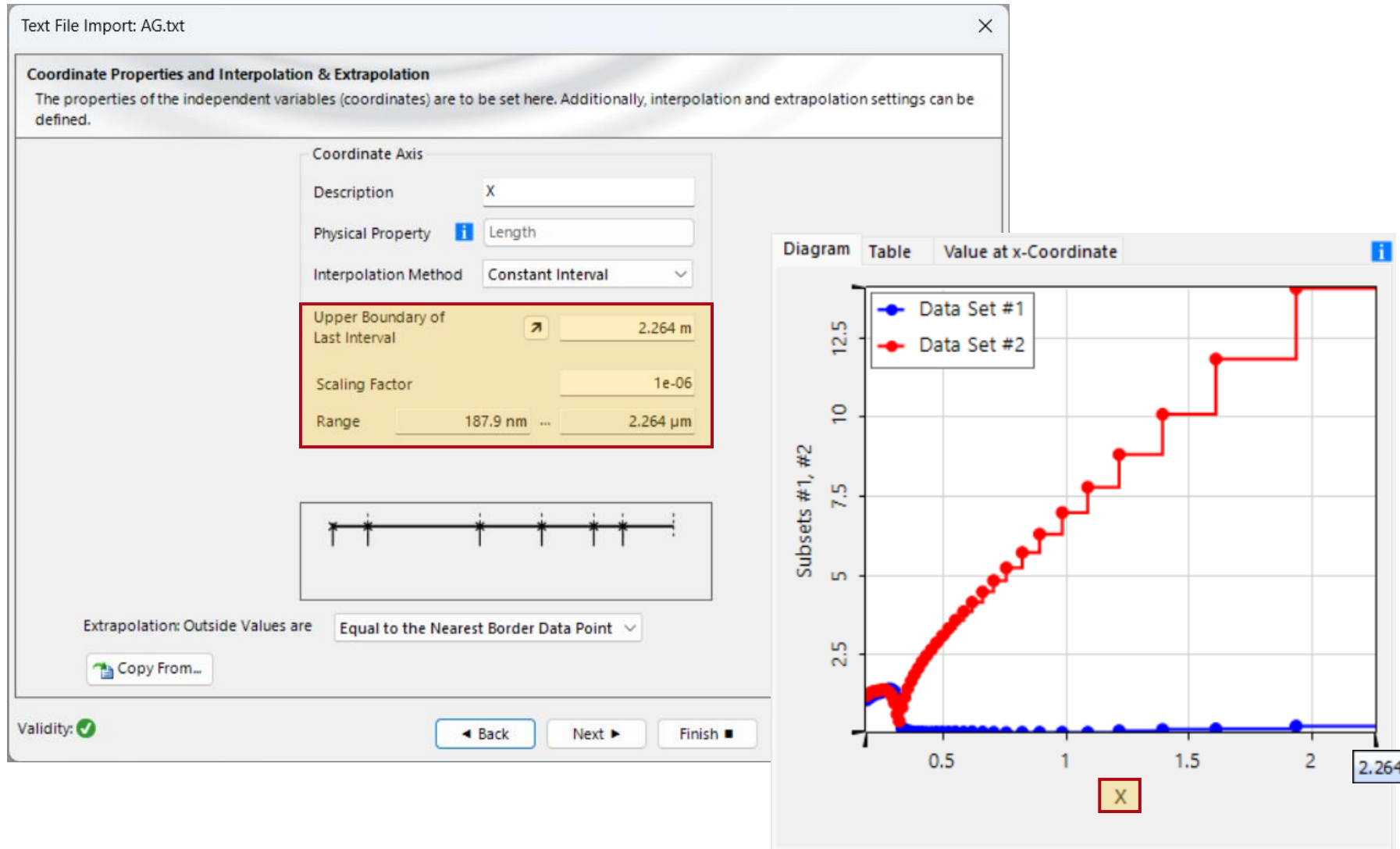
On the right, the 'Text File Import: AG.txt' dialog box is open. It shows the 'Parsing of Text' section with the following settings:

- Relevant Content: Read Rows from First Row to Last Row. Ignore First 0 Characters in Row.
- Suggest Characters: Contains Complex Values (unchecked).
- Handling of Rows and Columns: Skip Lines Starting with #. Column Separator: Any Whitespace.
- Handling of Numbers: Decimal Separator: Comma. Digit Group Delimiter: (None).

The dialog box also displays a preview of the data from the text file, which is the same table as shown on the left. The 'Validity' indicator is green, and the 'Next' button is highlighted.

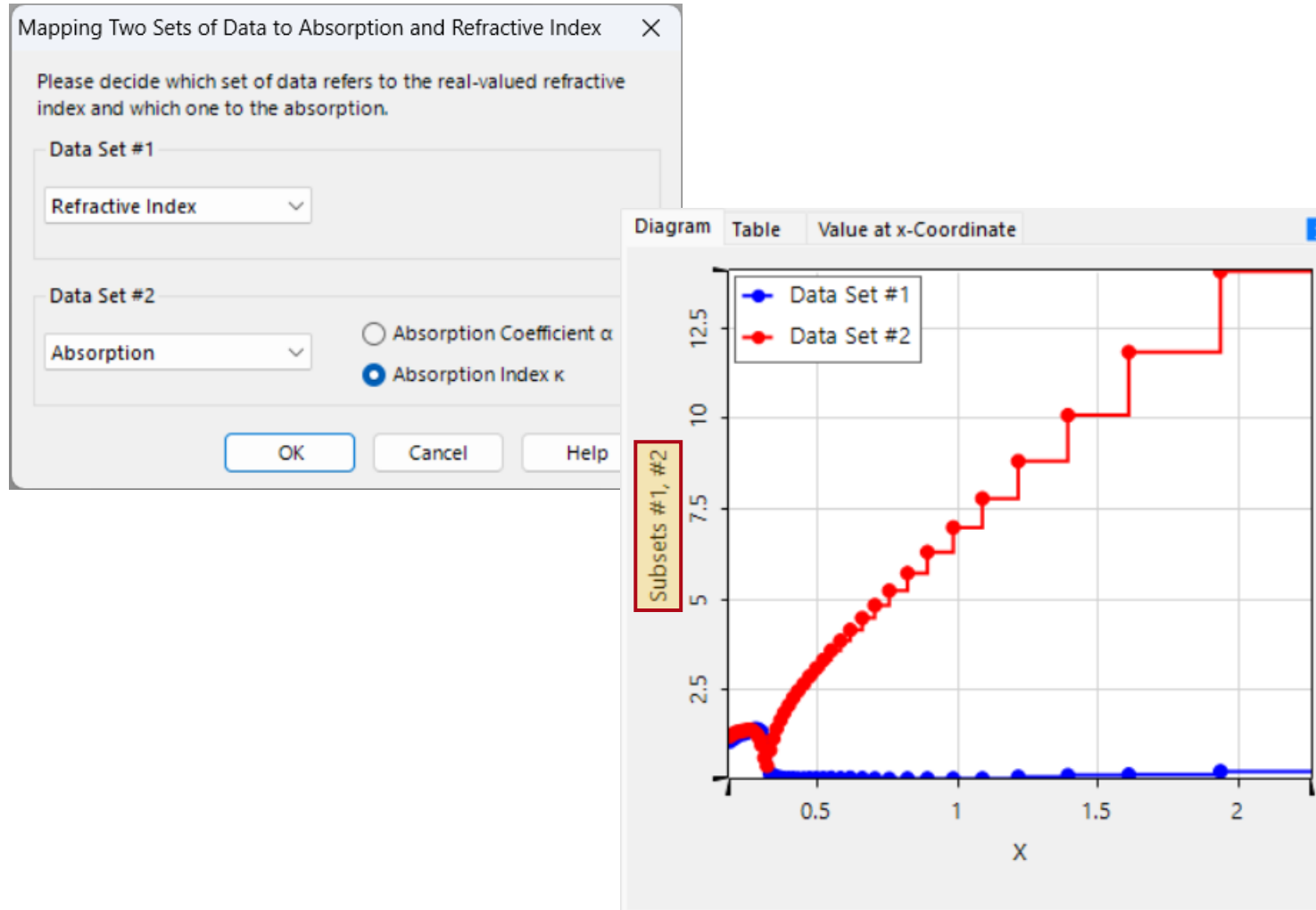
To interpret text strings as numbers, it is necessary to provide the basic information from the text file. In this example, the *Decimal Separator* is a comma, the *Column Separator* is whitespace, and all numbers are real values, so the option *Contains Complex Values* should be left unchecked.

Coordinate Setting



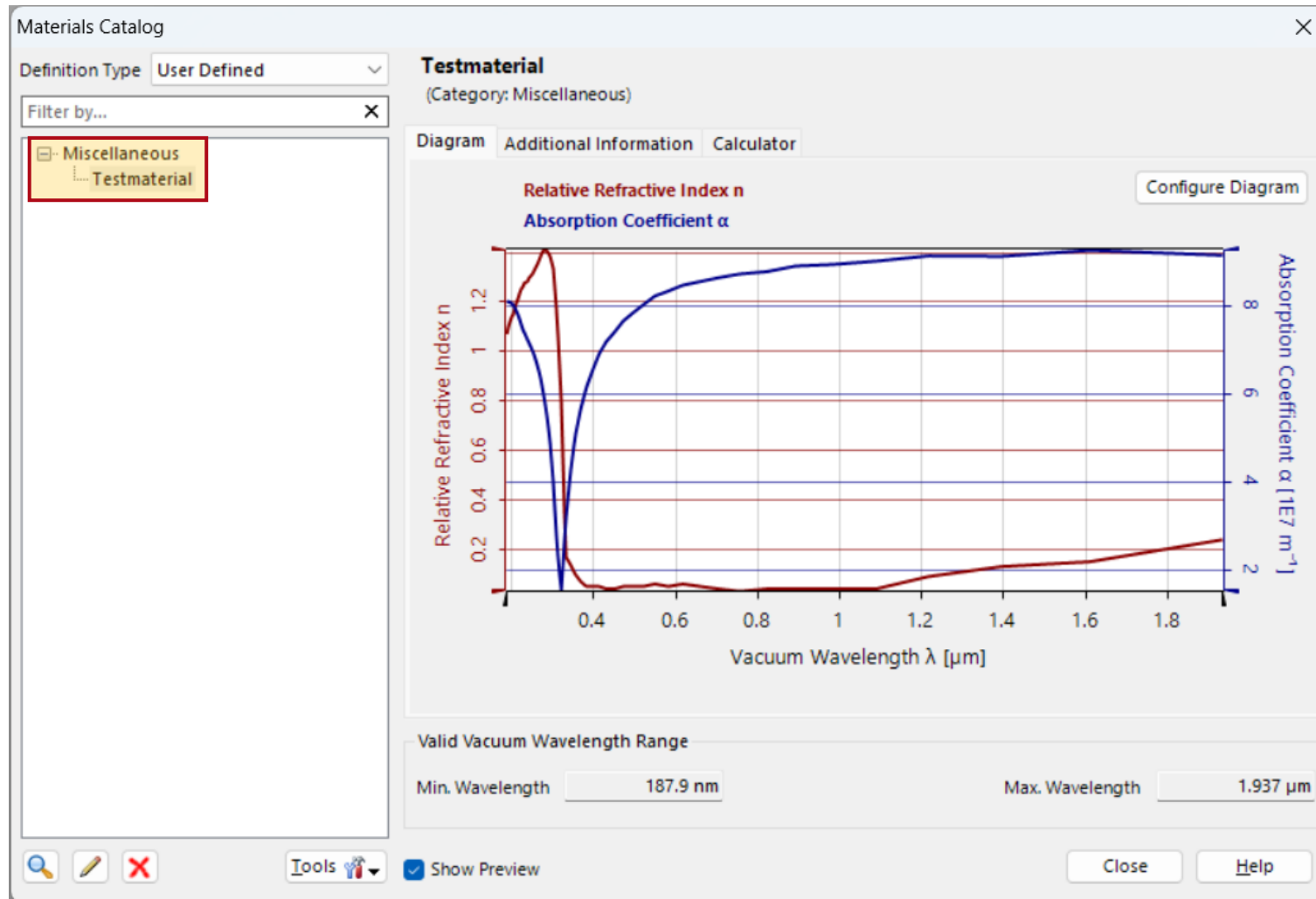
For this non-equidistance 1D data array, the maximum value of the x-coordinate is automatically determined, with the default length unit being meters. To ensure that the x-axis values correspond to the wavelength of light, you need to specify the correct *Scaling Factor*.

Subset Setting



In the final step of the import wizard, you can specify the properties of the imported subsets.

View in VirtualLab Fusion



Find the imported material in the *Materials Catalog*, where you can view or further edit its properties.

Document Information

| | |
|---------------------------------|--|
| title | Import of Material Data into VirtualLab Fusion |
| document code | SWF.0007 |
| version | 2.0 |
| toolbox(es) | VirtualLab Fusion Basic |
| VL version used for simulations | 2024.1 (Build 1.132) |
| category | Feature Use Case |

Document Information

| | |
|-------------------|--|
| title | Import of Material Data into VirtualLab Fusion |
| document code | SWF.0007 |
| document version | 2.0 |
| required packages | - |
| software version | 2024.1 (Build 1.132) |
| category | Feature Use Case |
| further reading | |