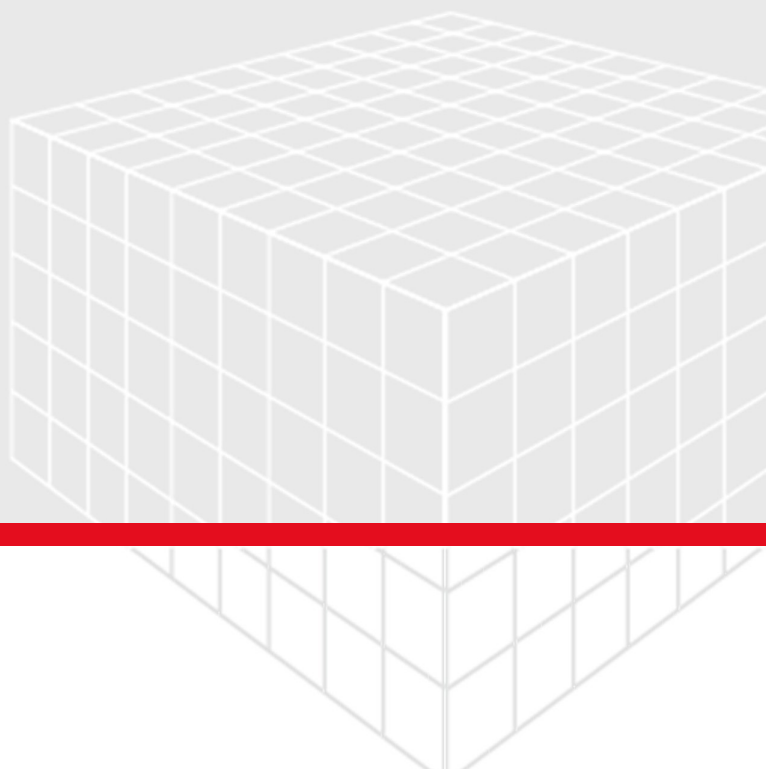


Material Database

User Guide

GEODICT Release 2026

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GEODICT

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Material Database

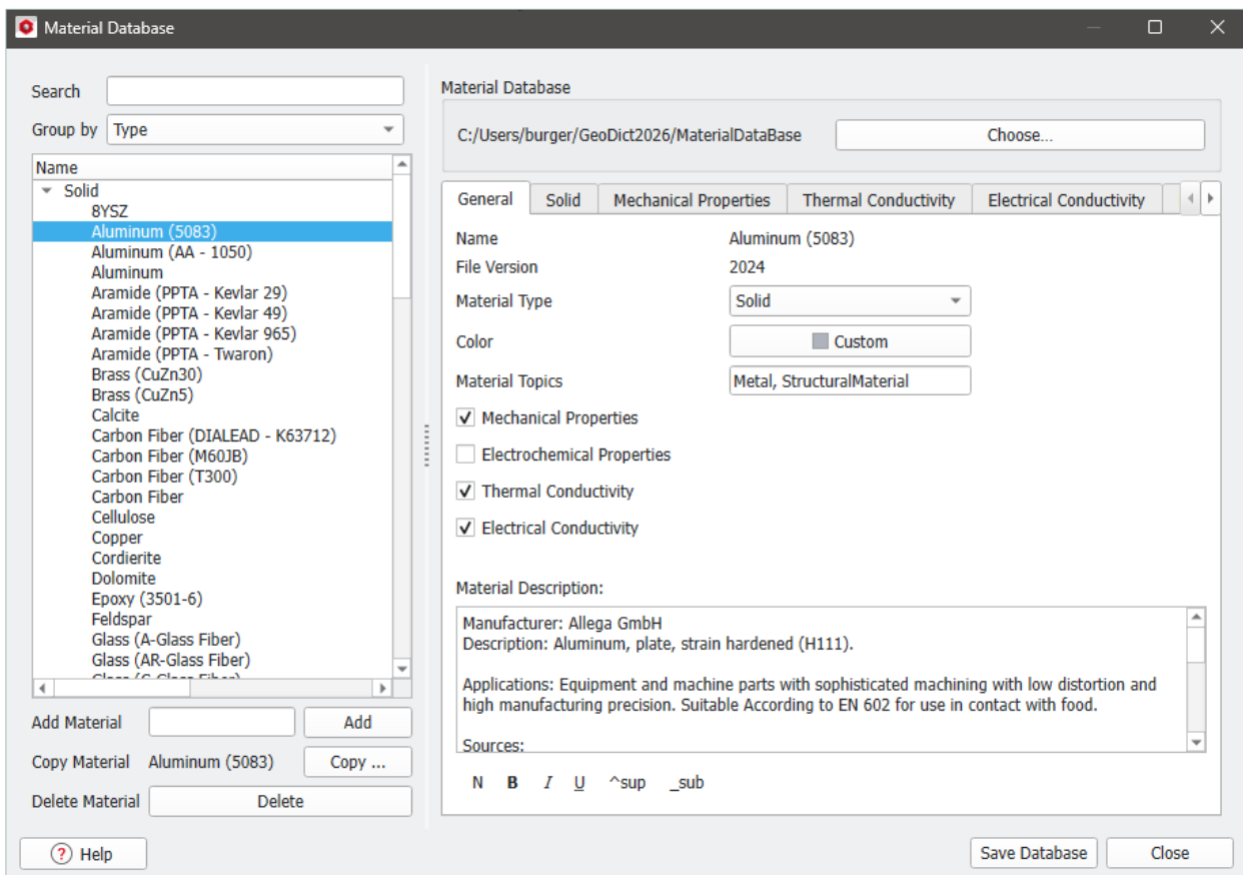
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1 Material Database

Structures in GeoDict are 3D voxel images where each voxel has one of 256 possible Material IDs. To each of these Material IDs, a material can be assigned. This means that a structure in GeoDict can contain up to 256 different materials. Materials in GeoDict can contain all material properties that are needed for simulations in GeoDict.

The GeoDict **Material Database** is the place to store material data. A selection of standard materials is already predefined, but the true strength of the database is that it allows the user to define additional materials to be used in GeoDict simulations.

The information for each material in the GeoDict material database is saved as a *.txt file in the material database folder. Therefore, materials can either be edited in the material database editor or by editing the corresponding *.txt file. Materials can be exchanged by copying these *.txt files.



Materials can be assigned to GeoDict structures during the creation with GeoDict structure generation modules (e.g., FiberGeo, GrainGeo, WeaveGeo, ...) or during the import from μ CT-scans. Additionally, they can be set for the structure currently in memory. When saving a structure in a GeoDict format (as *.gdt or *.gad file), its constituent materials and their properties are saved in that file, too.

This allows for directly simulating on a structure loaded from its file, there is no necessity to select the materials and their properties for the simulation run. However, it is always possible to change the materials and their properties prior to simulation.

Learn to use the Material Database:

- [Materials in GeoDict](#)  ⁵
Learn how constituent materials are defined and organized in GeoDict.
- [Material Colors](#)  ¹⁸
Learn how to use stored material colors for display purpose.
- [Edit and expand the GeoDict material database](#)  ²²
Learn how to edit the properties of predefined materials and how to create new constituent materials in the GeoDict Material Database.



Join the conversation

Visit the Community on [GeoDict Forum](#) to be inspired and get answers to top questions.

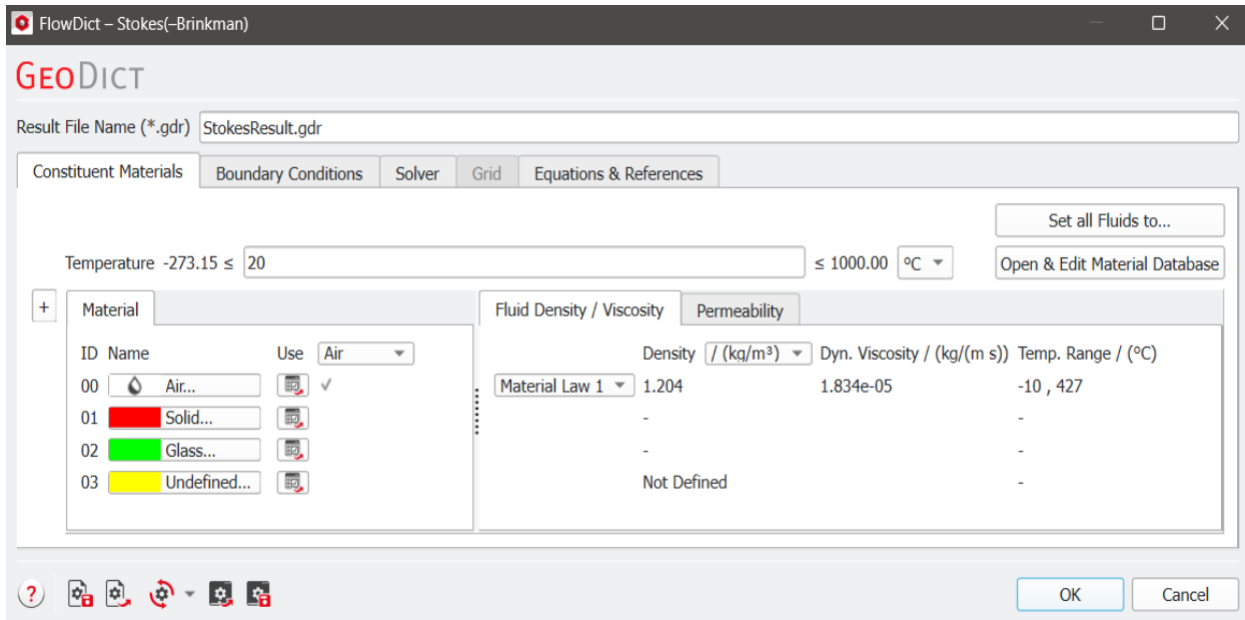
Find illustrative application examples on the [website](#).

Our tutorials and seminar videos give you a first hands-on experience. They are collected in the [Learning Center](#).

Send your [Support Request](#) to our technical Support.

1.1 Materials in GeoDict

A material in GeoDict can either be a predefined material, which is selected from the GeoDict material database, or set to be **Manual**. In some cases, the material for a given Material ID might be unclear. Then, the material is **Undefined**.



Manual materials allow to quickly set the required parameters, whereas using materials from the material database allows to use the predefined parameter values.

Materials can be defined during the creation of a microstructure using the GeoDict structure generation modules or prior to simulation with one of the GeoDict predictor modules. For a structure in memory, the materials can also be changed independently of any module.

Different parameters from various application fields can be entered and saved for all materials, except for undefined materials. Depending on the material type, different parameters of the material must be entered.

Topics of this section

- [Setting the constituent materials](#) ⁵
Learn how materials can be set in GeoDict.
- [Reassigning Materials and Materials IDs](#) ¹³
Learn how to substitute one material (or material ID) for another.

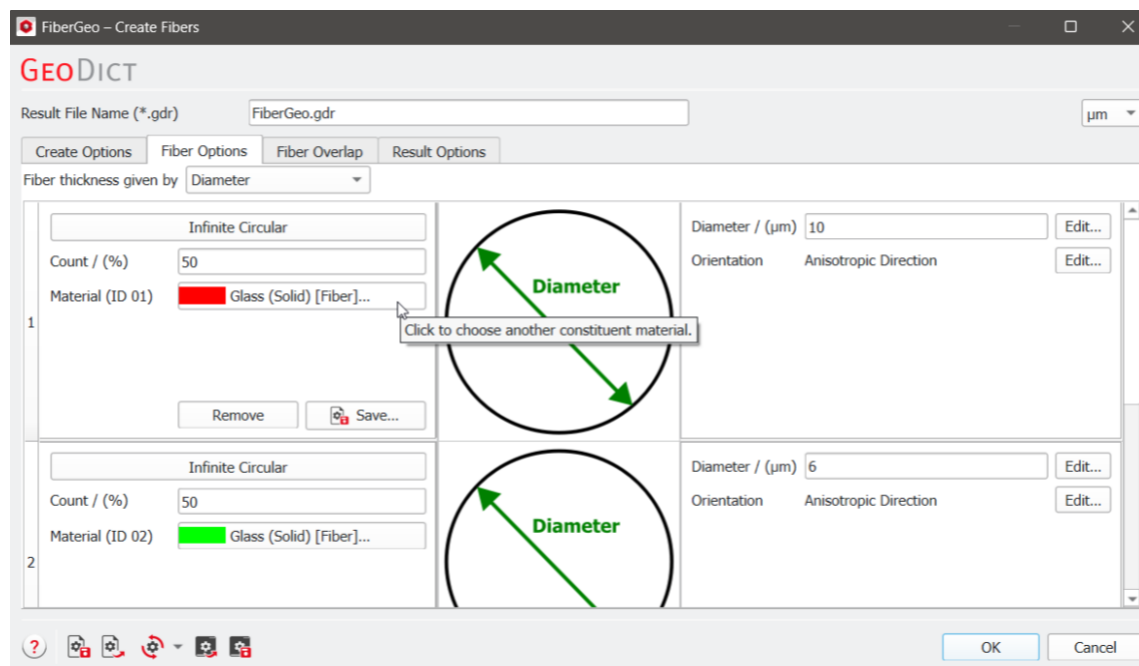
1.1.1 Setting the constituent materials

The constituent materials are selected during the generation of a structure or during the import from 3D image data. Afterwards, the constituent materials can be changed if needed.

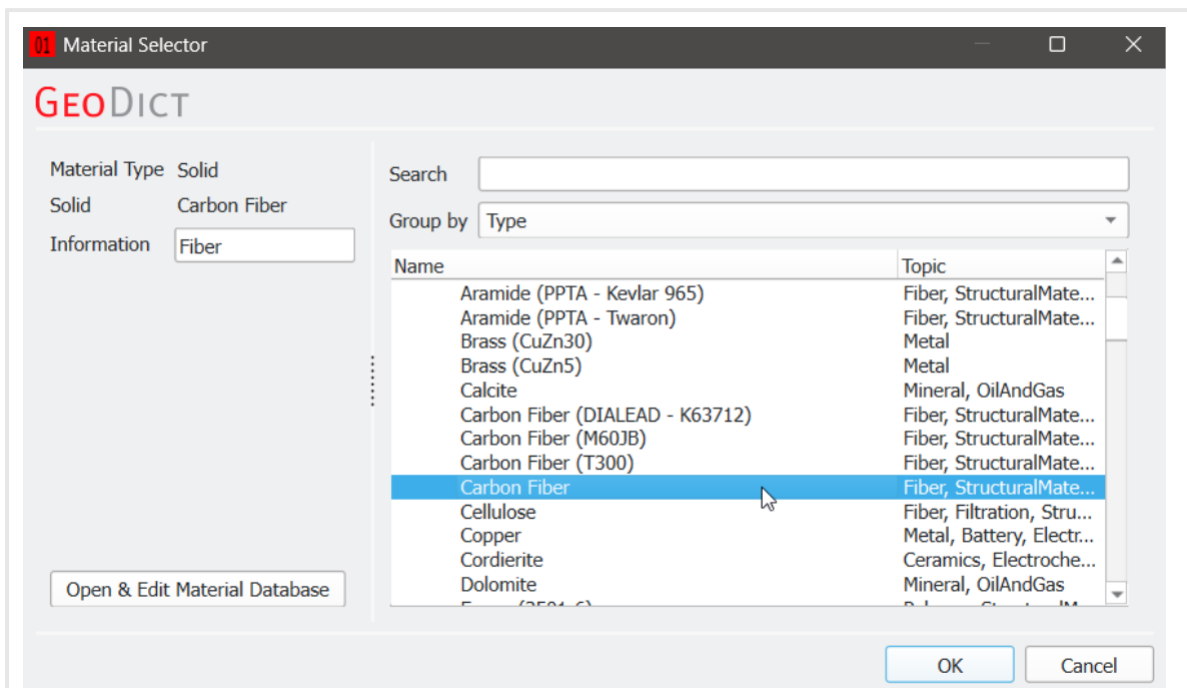
✓ Setting materials during structure generation

In the structure generation modules (available under Model in the menu bar), the material parameters of the Material IDs in the structure can be entered before the structure is created. In most cases, there is the option Material (ID XX) and a button with the color and material name on it. Clicking on the material opens the Material Selector dialog where another material can be chosen.

An example for the selection of the constituent materials in FiberGeo is shown below. For each fiber type, the material can be selected by clicking the corresponding button.



The **Material Selector** dialog opens, and all materials stored in the current material database are available. At the top left, the number and color of the currently selected Material ID can be seen.



On the left side, the **Material Type** and the name of the currently selected material are given. Additionally, use the **Information** field to enter, e.g., an additional description of the role of the material in the structure. Below, there is the possibility to **Open & Edit** the **Material Database** to check or change the parameters of this material. The Material Database is described under [Edit and expand the GeoDict material database](#) ²².

On the right side, all available materials can be browsed. Either by directly typing the name in the **Search** bar, or, after grouping by **Type**, **Topic**, or **Property**, scrolling through the list. The currently selected material is highlighted in blue.

The main way to differentiate between materials is the **Material Type**. Available are **Fluid**, **Solid**, and **Porous Solid**, which is a mix between pore and solid. There are two special material types, which are **Pore** and **Undefined**. The type **Pore** can be described as a voxel containing nothing, especially no solid material and has 100% porosity. For **Undefined** materials nothing is known about the material and all parameters are set to **Not Defined**.

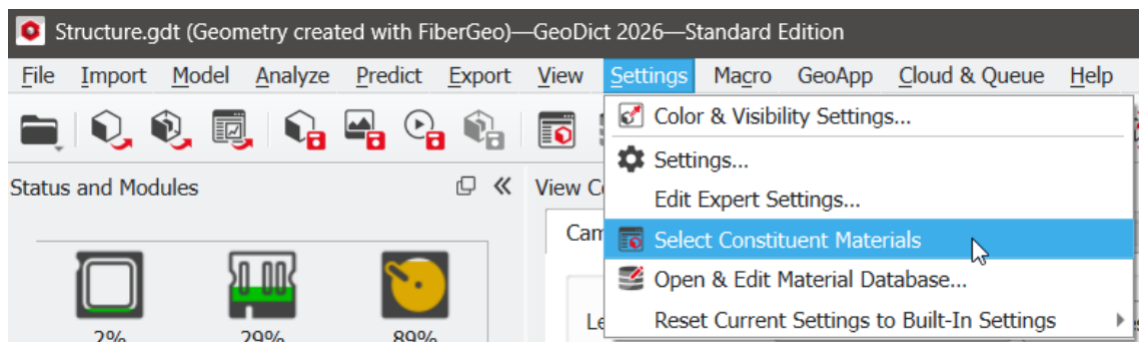
For many materials one or more **Topics** can be entered. This could be an application field or an aggregate state. For example, the predefined material Air has the topics **Gas** and **Filtration**.

When grouping materials by **Property**, a material appears only in those groups where the corresponding properties are defined. The predefined material Air is listed under the properties **Fluid Density / Viscosity**, **Mechanical Properties** as well as **Thermal** and **Electrical Conductivity** as for all of these fields parameters were set for Air.

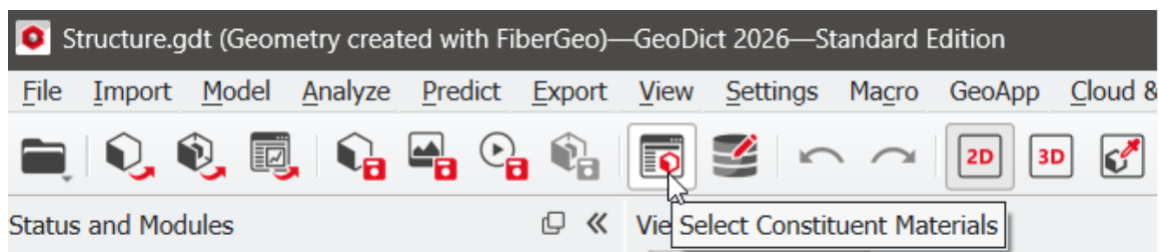
Click **OK** to save the selected material for this Material ID and to close the material selector.

✓ Setting materials for the current structure

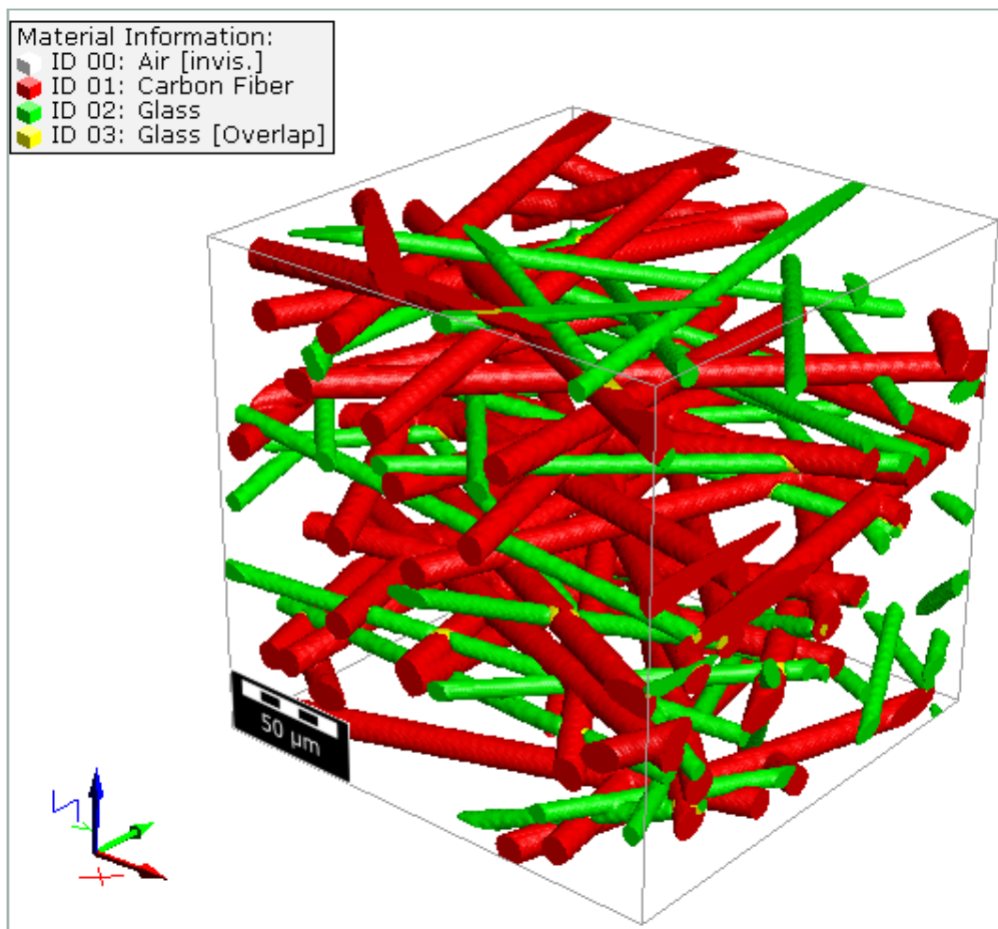
The constituent materials for the structure currently in memory can be changed by selecting **Settings** → **Select Constituent Materials** in the menu bar.



Alternatively, click the corresponding icon in the toolbar.



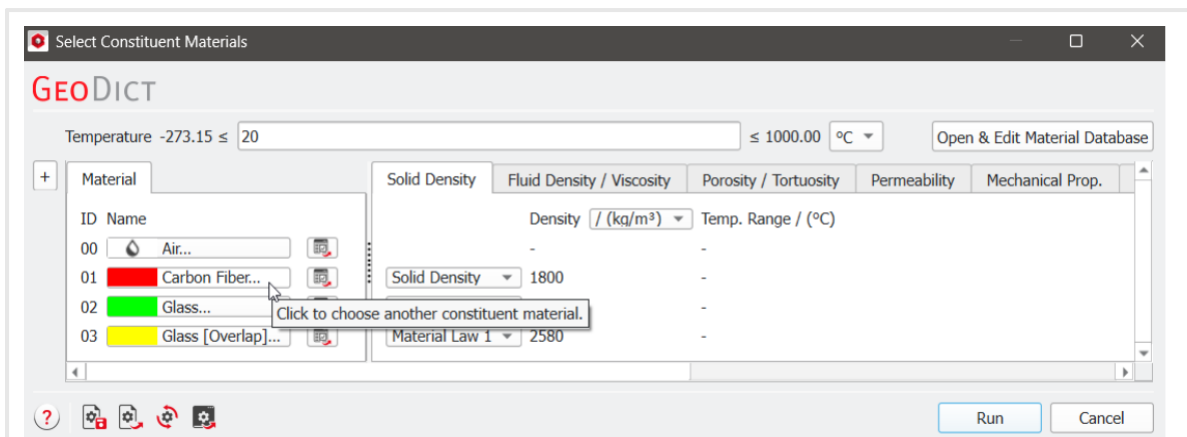
In the following, the workflow for changing the material which is assigned to Material ID 01 from **Carbon Fiber** to **Glass** is demonstrated using the example structure below.



The **Select Constituent Materials** dialog shows the material information of all Material IDs that are present in the currently loaded structure. Clicking on the plus icon next to **Material** shows all 256 Material IDs. The icon changes from plus to minus to hide the Material IDs which are not present in the current structure.

At the top, the current temperature is shown and can be changed. The temperature unit can also be changed, available are **K**, **°C**, and **°F**. This is important if temperature dependent properties are considered.

Located at the top right is the button to **Open & Edit Material Database**. The Material Database is explained in the section [Edit and expand the GeoDict material database](#) ²²



On the left side, the Material IDs, their assigned material, and its color are shown. Please refer to [Material Colors](#)^[18] for more details on how to change the color.

The  button next to it opens a report of the relevant parameters for this Material ID.

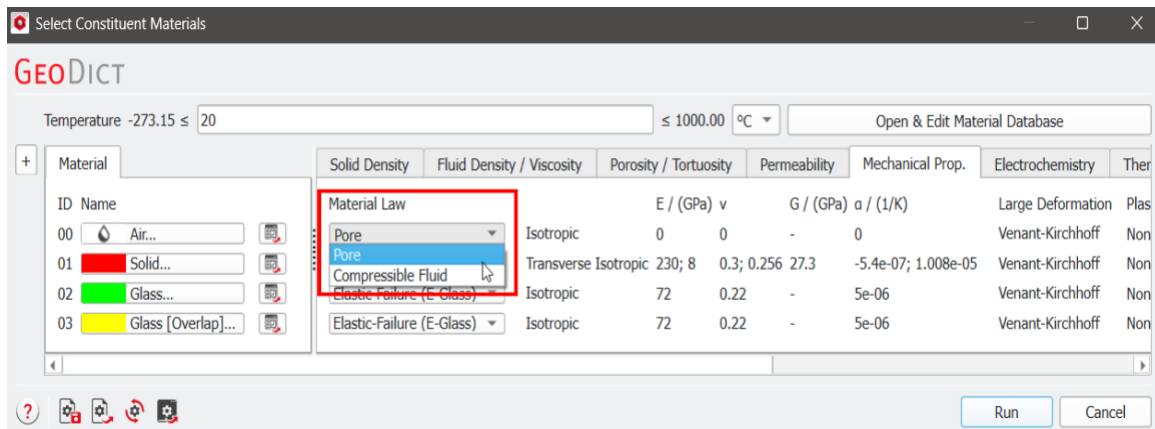
Report for Material with ID 01

Key	Unit	Value
Type		Solid
Name		Carbon Fiber
Information		
▼ SolidProperties		
CurrentLaw		1
NumberOfLaws		1
▶ MaterialLaw1		
▼ ThermalConductivity		
CurrentLaw		1
NumberOfLaws		1
▶ MaterialLaw1		
▼ ElectricalConductivity		
CurrentLaw		1
NumberOfLaws		1
▶ MaterialLaw1		
▼ MechanicalProperties		
CurrentLaw		1
NumberOfLaws		2
▶ MaterialLaw1		
▶ MaterialLaw2		
▼ DiffusionCoefficient		
Type		Isotropic
Diffusivity	m ² /s	0
▼ ContactAngle		
ContactAngle		140
▶ Electrochemistry		

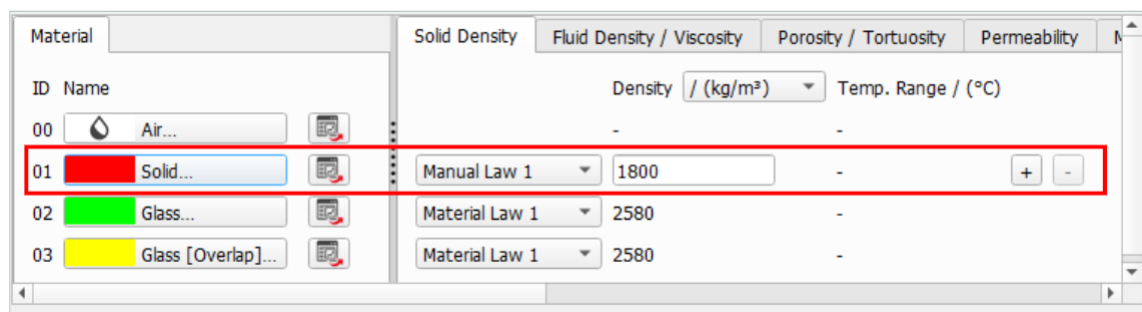
Close

On the right side of the **Select Constituent Materials** dialog, all available parameters are grouped into several tabs. For materials from the Material Database, you can check the saved parameters. For some of the parameters, multiple material laws can be defined in the Material Database, please refer to chapter [Edit existing material database entries](#)^[28] for more details.

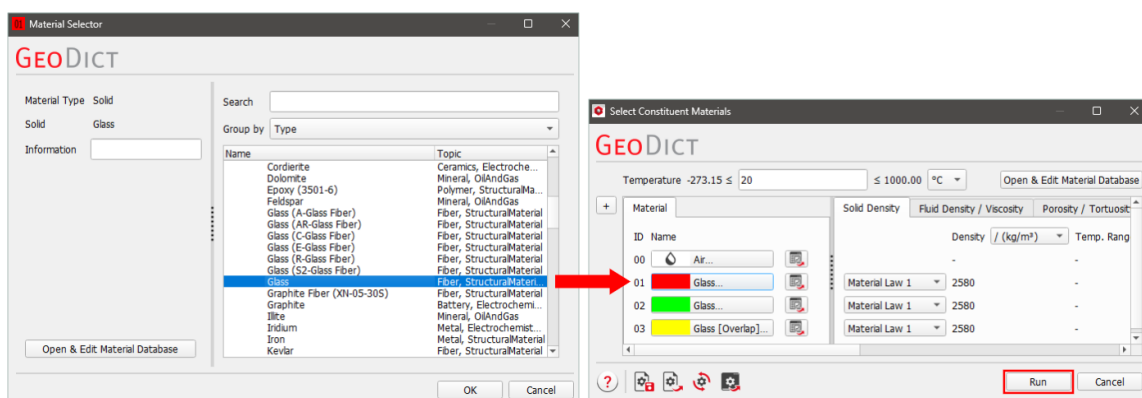
If multiple material laws are defined for a material, you can select the desired one in a drop down menu.



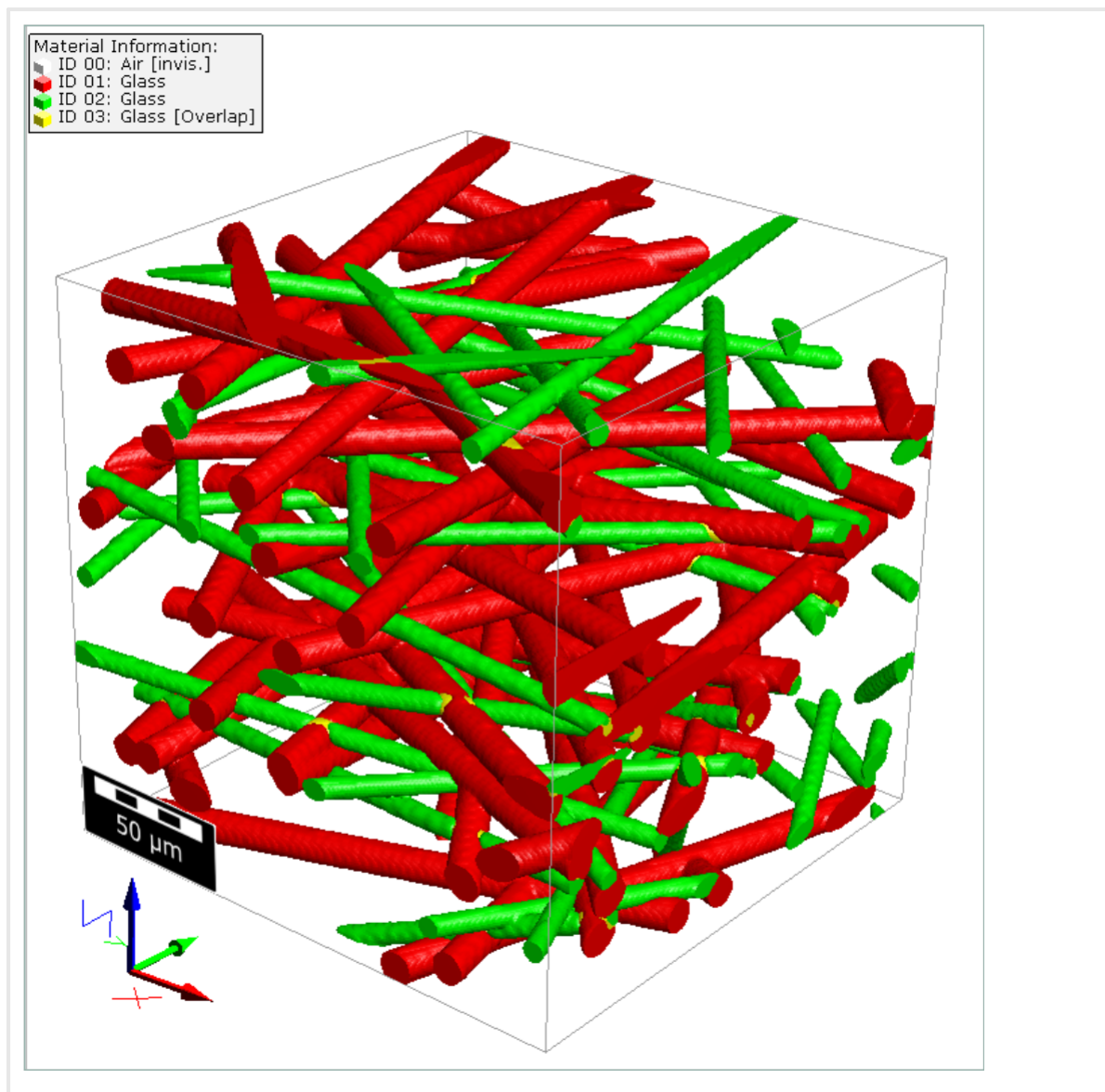
For **Manual** materials, which are not stored in the material database, you can define the necessary parameters in this dialog. It is also possible to define multiple material laws by clicking on the + icon at the end of a line to add a new material law. Delete additional laws by clicking on the – button.



The material of a Material ID can be changed by clicking on the material name. Then, the **Material Selector** dialog opens and the desired material can be selected.

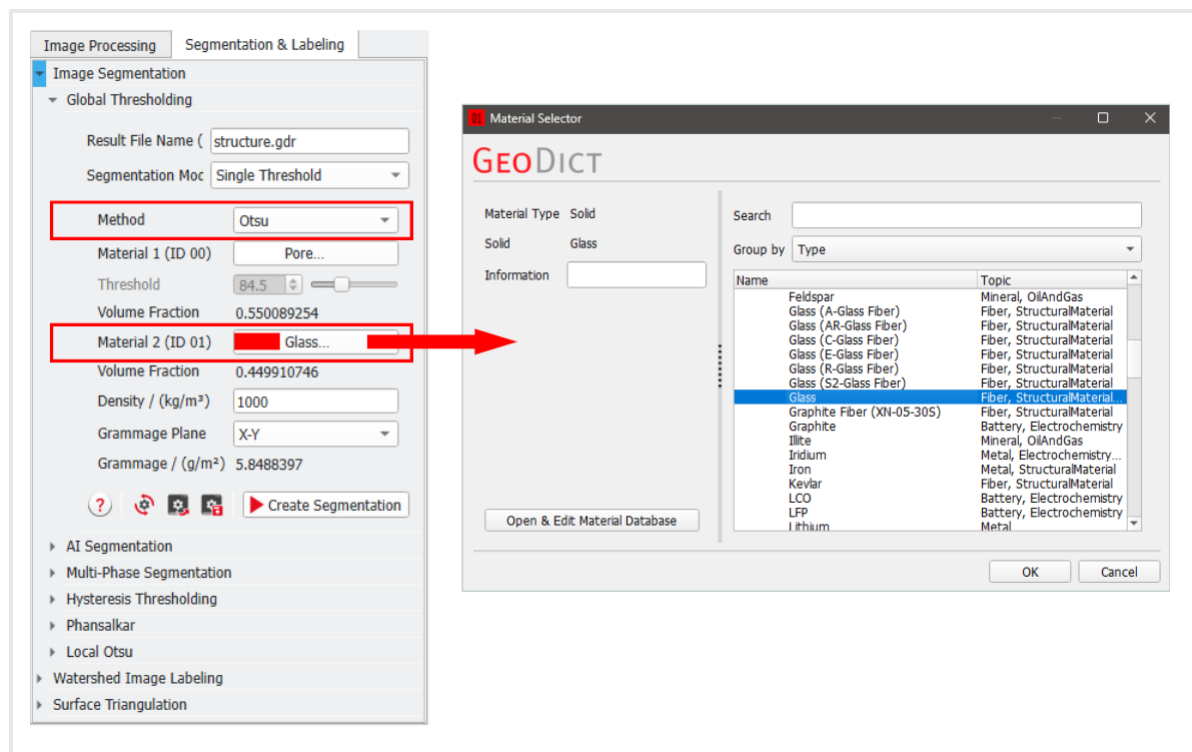


Click on **Run** to apply the selected materials and their properties and update the structure. Please note that the structure including the redefined materials is not saved as a structure file (.gdt) automatically.



✓ Setting materials during import

When a structure is imported in GeoDict (e.g., from a μCT -scan), its constituent materials can be set during the import. By default, the material with Material ID 00 is set to Pore (Fluid), whereas all other Material IDs are set to Manual (Solid). You can change the material by clicking on the corresponding material button and choosing the desired material in the [Material Selector](#) dialog.

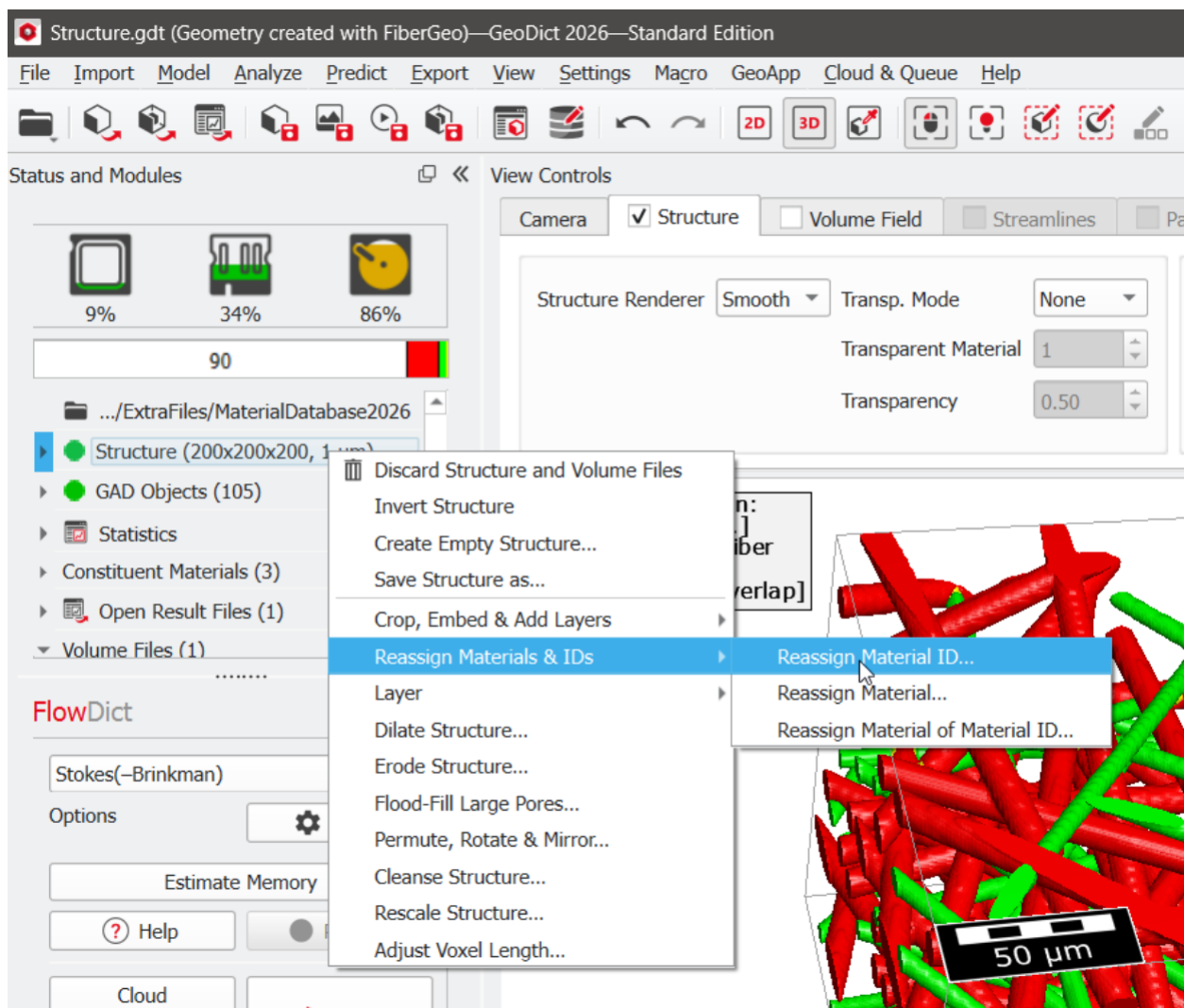


1.1.2 Reassigning Materials and Materials IDs

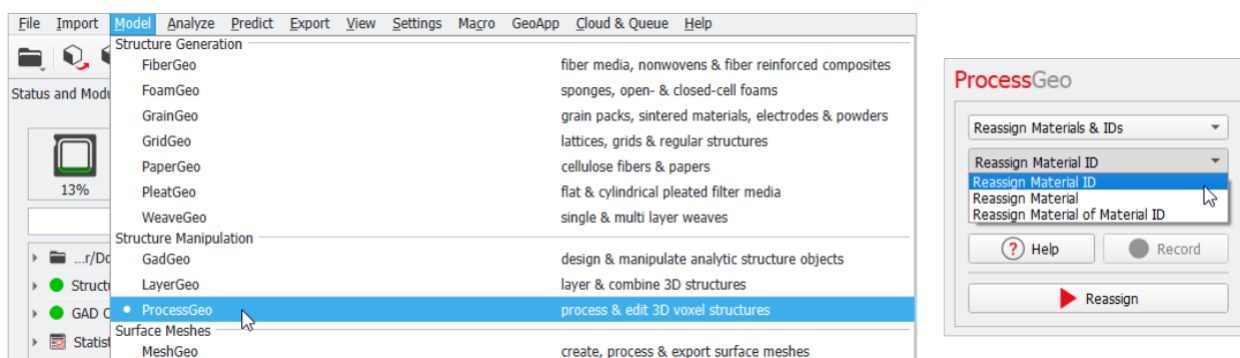
One option to change materials in the structure is the **Select Constituent Materials** dialog, as described in the chapter [Setting the constituent materials](#). Depending on the use case, there are other options available through the ProcessGeo module.

It is possible to **Reassign Material IDs**, to **Reassign Materials** and to **Reassign the Material of a Material ID** (this corresponds to the option in the **Select Constituent Materials** dialog).

To access the options for reassigning quickly through a shortcut, right-click on **Structure** in the **Project Status** section on the left side of the GeoDict GUI.



Alternatively, these options are also available from the menu bar by selecting **Model** → **ProcessGeo** → **Reassign Materials & IDs**.



Topics of this section

- [Reassign Material ID](#)¹⁵
Learn how to assign a new Material ID to voxels with a given Material ID.
- [Reassign Material](#)¹⁶
Learn how to assign a new material from the GeoDict Material Database to all voxels of

Topics of this section

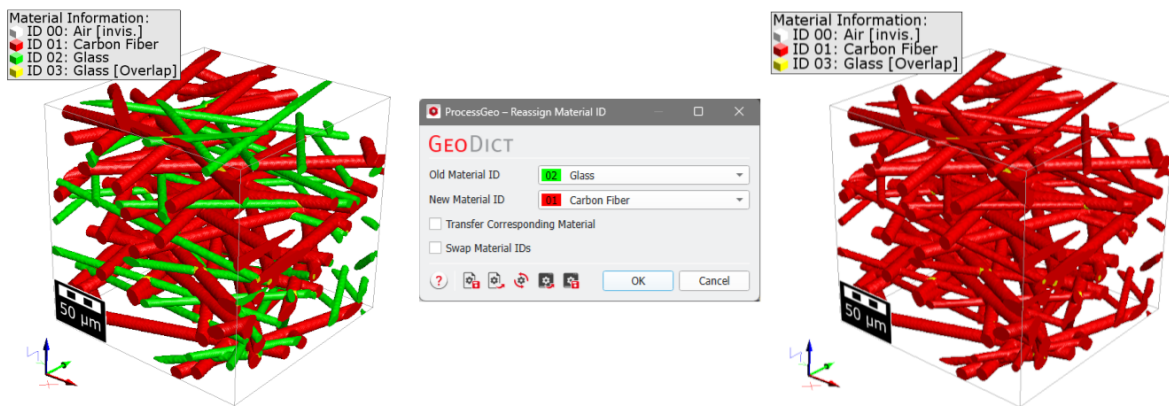
another material.

- [Reassign Material of Material ID](#)¹⁷

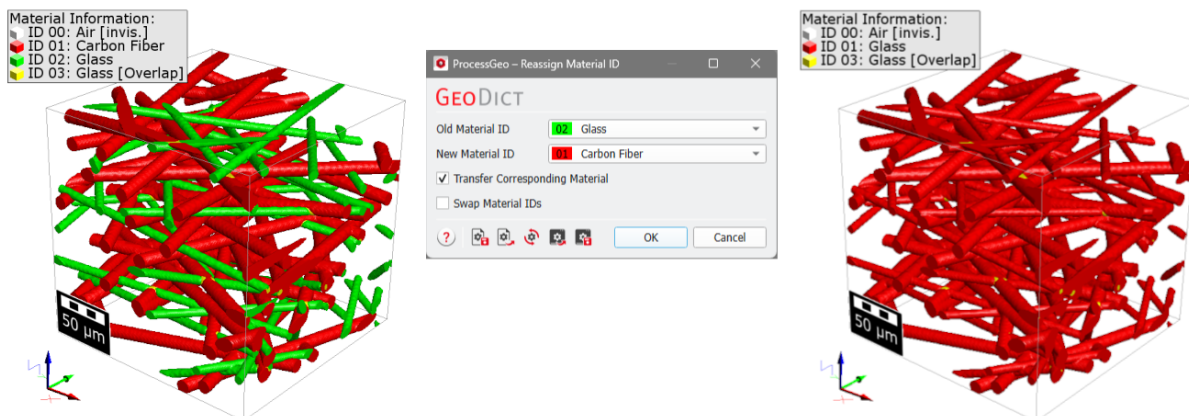
Learn how to reassign the material for a given Material ID, without changing the Material ID.

Reassign Material ID

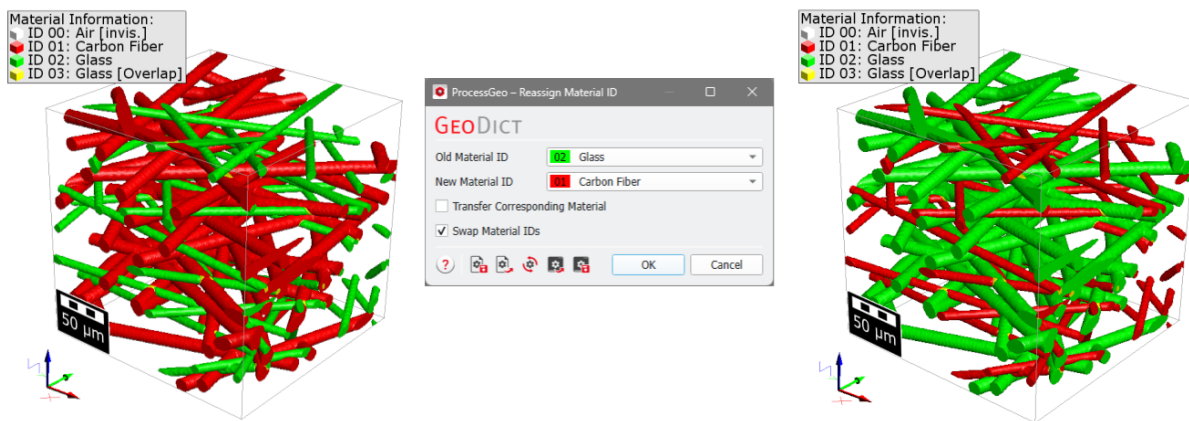
With **Reassign Material ID**, the Material ID of the corresponding voxels in the structure is changed. In the example shown below, the Material ID 02 is reassigned to the Material ID 01. No voxels with Material ID 02 remain in the structure, and it is not possible to distinguish which fibers belonged to which ID (01 or 02) after the reassignment.



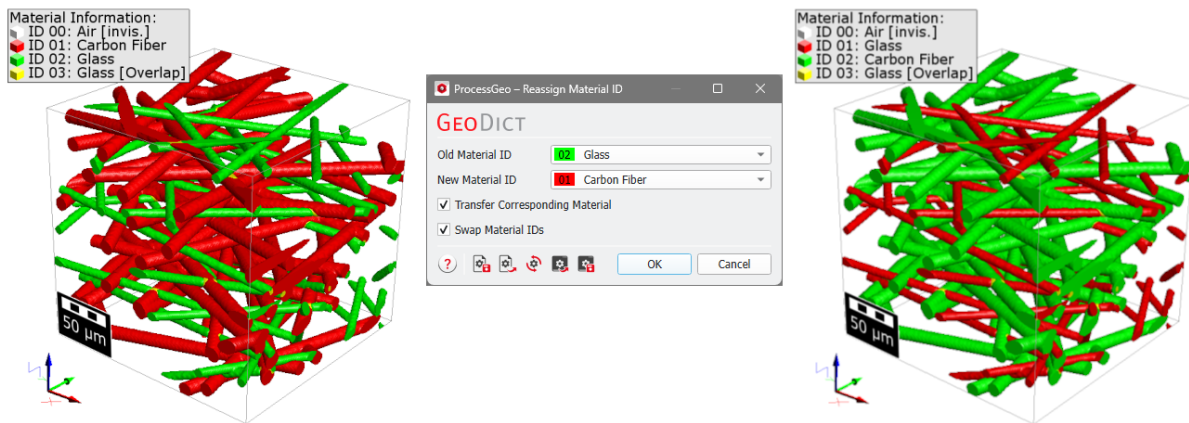
With the additional option **Transfer Corresponding Material** also the material of the new Material ID is changed to the material of the old Material ID.



Using **Swap Material IDs** allows to swap the old and new Material ID.

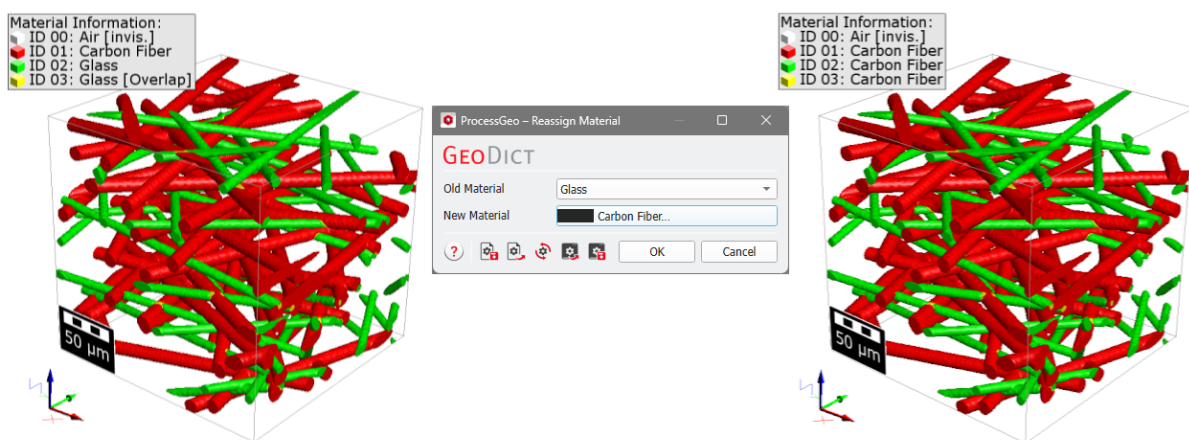


If additionally the option **Transfer Corresponding Material** is chosen, also the corresponding materials are swapped.



Reassign Material

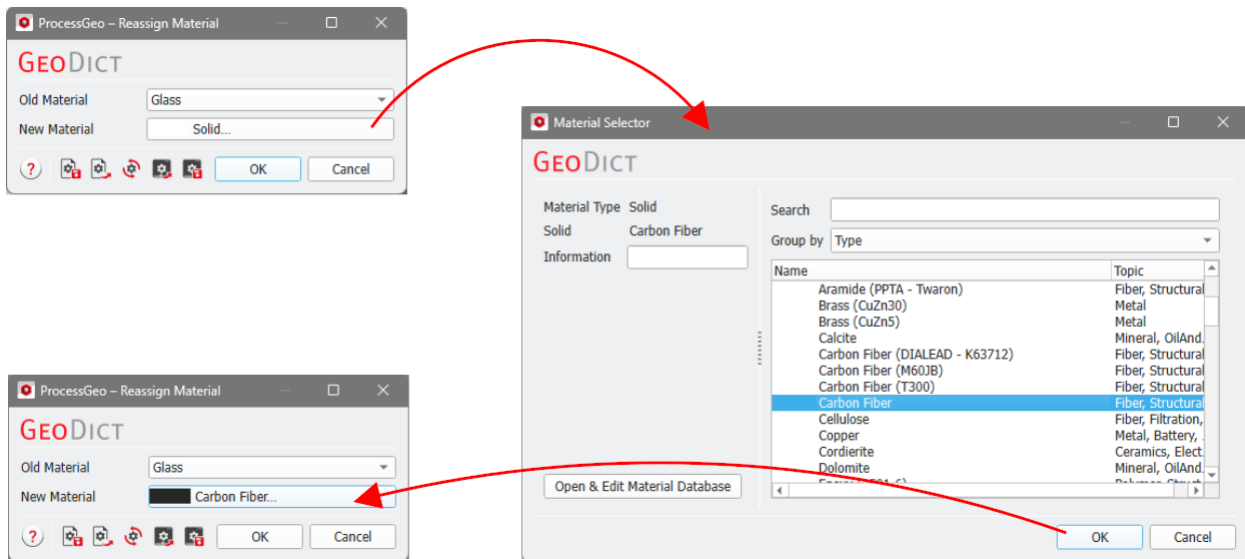
With **Reassign Material**, a material in the structure is replaced by another material. This means that the material is changed for all Material IDs which are set to this material. In the example below, **Glass** is changed to **Carbon Fiber**.



The material to be changed can be selected from the **Old Material** drop-down menu, which lists all materials that are present in the currently loaded structure.

By clicking on the material name of **New Material**, the [Material Selector](#) ⁶ opens and the

desired new material can be chosen.



Reassign Material of Material ID

The alternative **Reassign Material of Material ID** corresponds to the option available in the **Select Constituent Materials** dialog. As shown in this example, the material is changed for one selected Material ID (here: *Carbon Fiber* to *Glass* for Material ID 01).

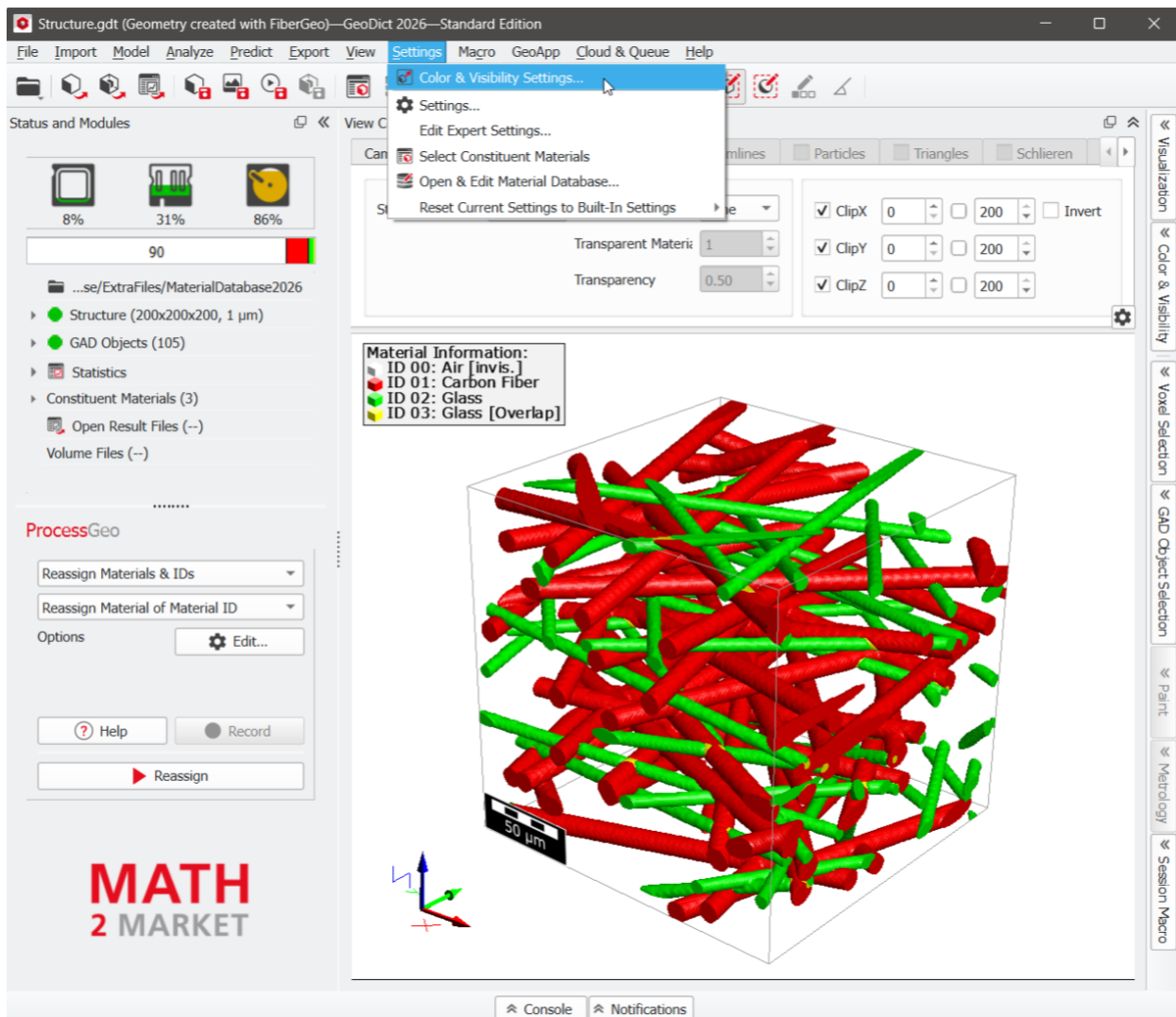


This command is especially helpful, if several Material IDs have the same material, but the material should only be changed for a certain Material ID.

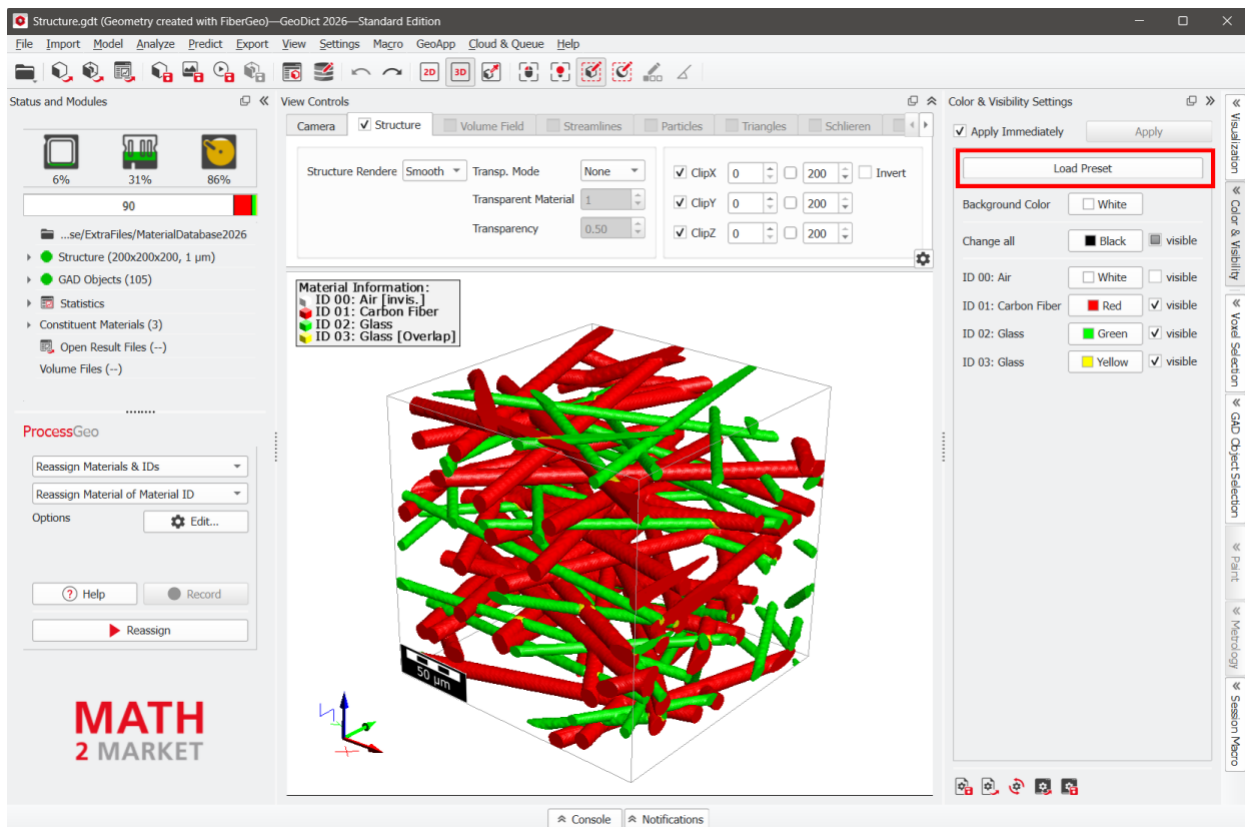
1.2 Material Colors

For each Material ID in GeoDict, a color can be selected for visualization. These colors are set globally in GeoDict and are not saved in the structure file. For each material in the material database, also a corresponding color is stored. In the following, it is described how to use these stored material colors for display.

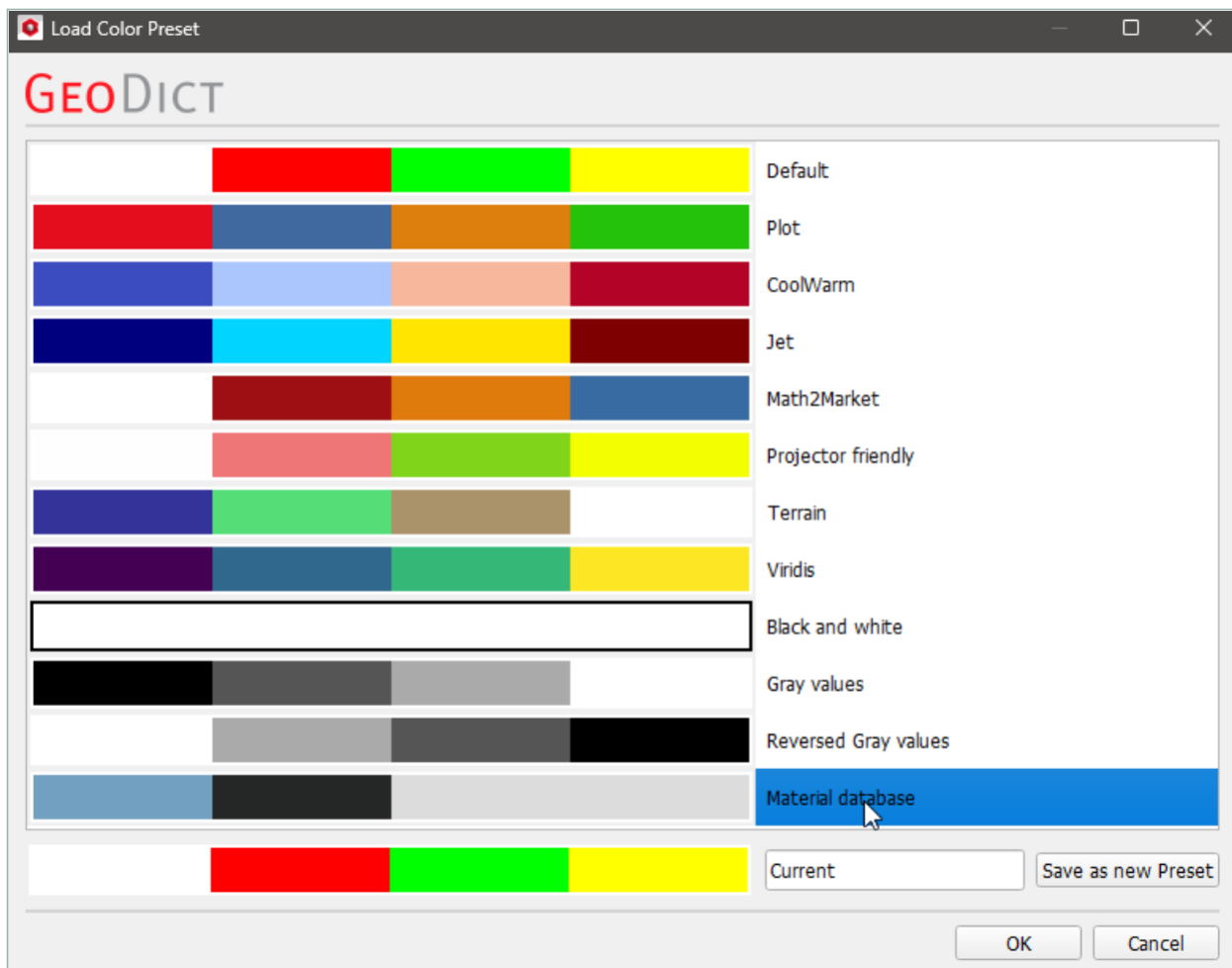
The color of a material in GeoDict can be changed through the **Color and Visibility Settings** dialog by selecting **Settings** → **Color & Visibility Settings...** in the menu bar, or by clicking the corresponding icon  in the toolbar. This opens the **Color & Visibility Settings** dialog, which can also be accessed directly from the sidebar on the right of the user interface.



The **Color and Visibility Settings** dialog shows the colors currently assigned to the Material IDs and the Constituent Materials.



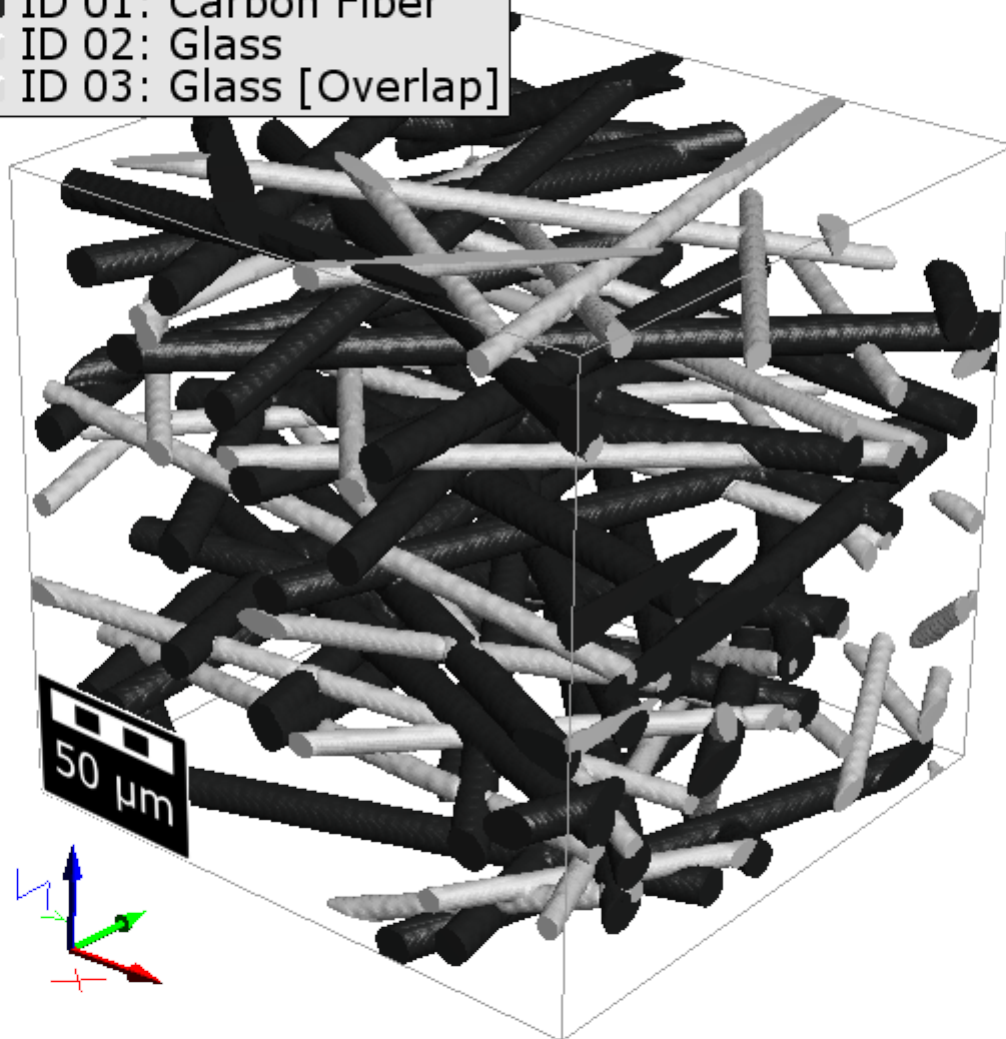
To use the colors defined in the GeoDict Material Database, click **Load Preset** and then, choose **Material database** in the **Load Color Preset** dialog. Confirm the choice with **OK** and close the **Color & Visibility Settings** with the **Close button**  in the top right.



For example, the preset color for Glass in the material database is a light gray, as shown here.

Material Information:

	ID 00: Air [invis.]
	ID 01: Carbon Fiber
	ID 02: Glass
	ID 03: Glass [Overlap]



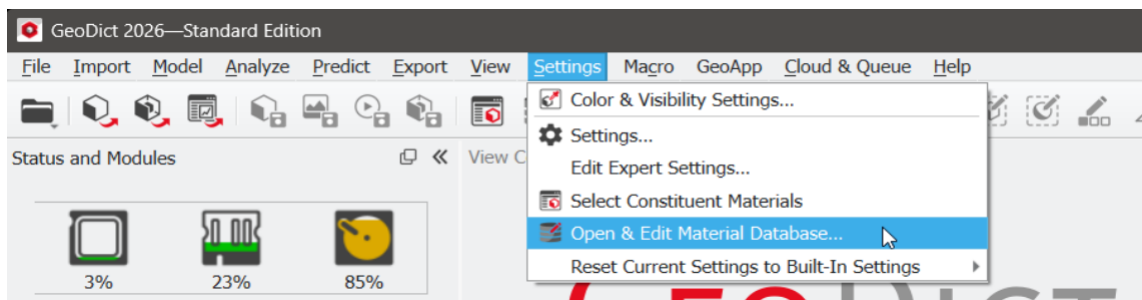
1.3 Edit and expand the GeoDict material database

The GeoDict Material Database installed with GeoDict can be viewed, edited, and expanded. In the following, it is explained how to access the Material Database, which information is stored in the Material Database, how to edit the properties of materials already included in the GeoDict Material Database and how to create new materials.

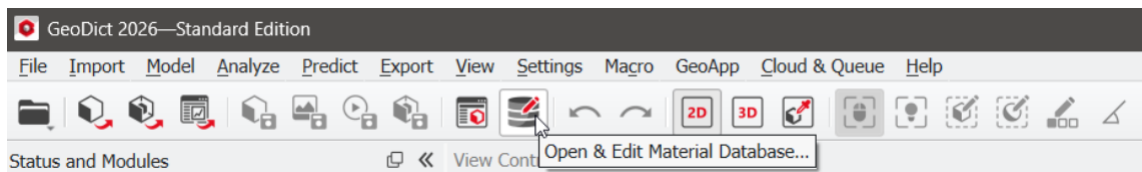
✓ Access the material database

There are several options to access the Material Database in GeoDict:

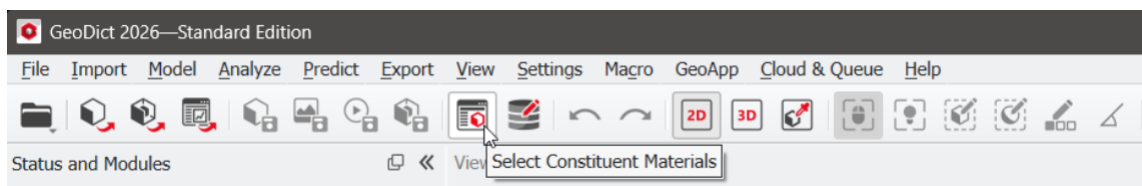
1. Select **Settings** → **Open & Edit Material Database...** in the menu bar.

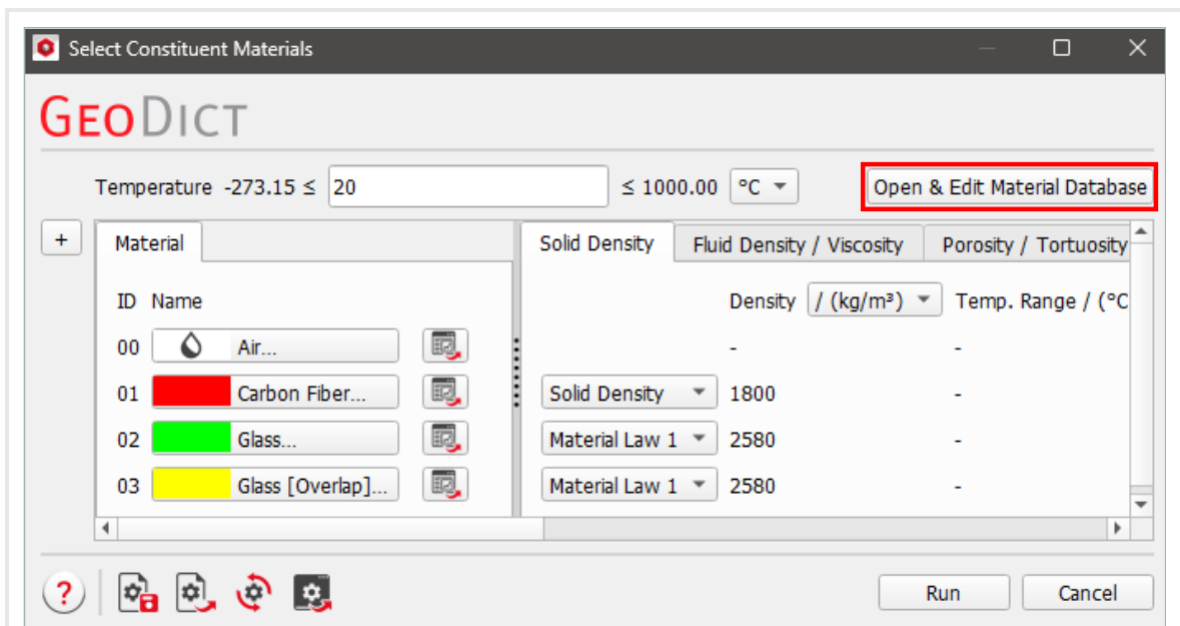


2. Click the Open & Edit Material Database icon in the toolbar.

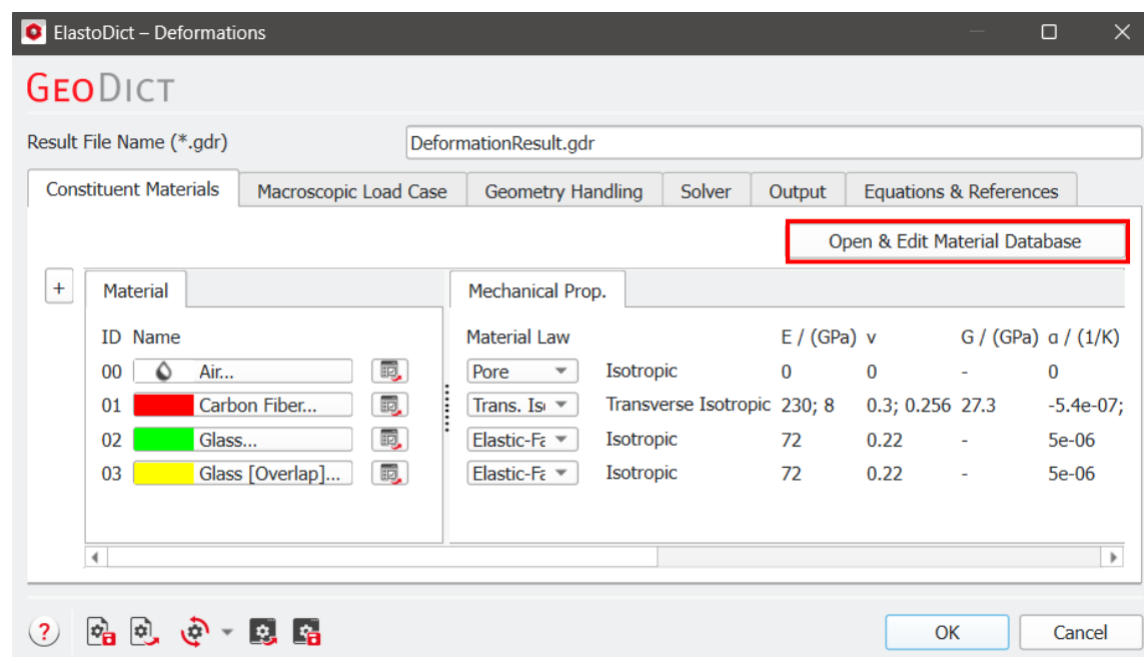


3. Click the **Select Constituent Materials** icon in the toolbar and click **Open & Edit Material Database** in the Select Constituent Materials dialog



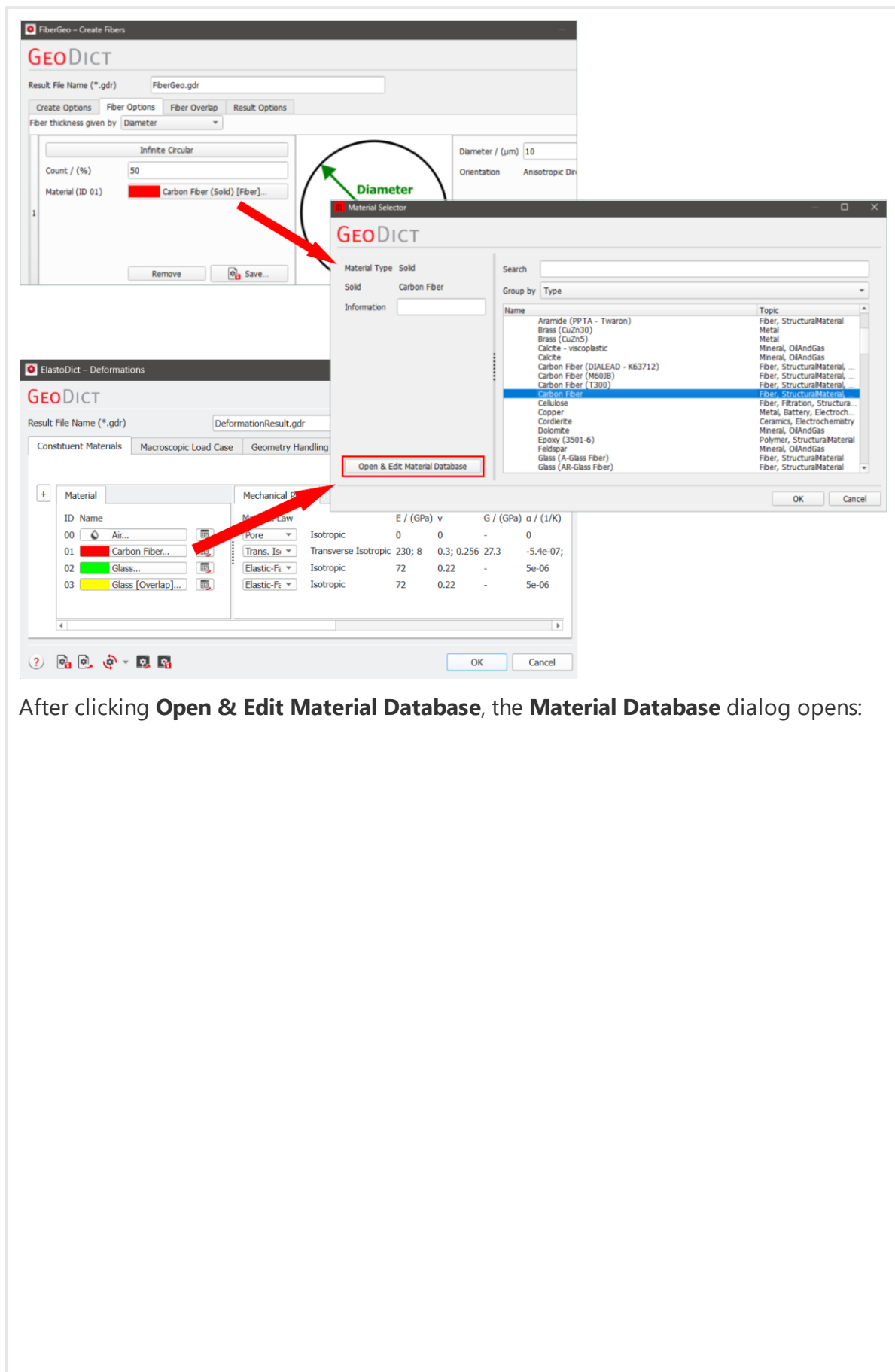


- Click the **Open & Edit Material Database** button located in the **Constituent Materials** tab of the **Solver Options** for the predictor modules (ElastoDict, ConductoDict, FlowDict, DiffuDict, FilterDict, etc.):

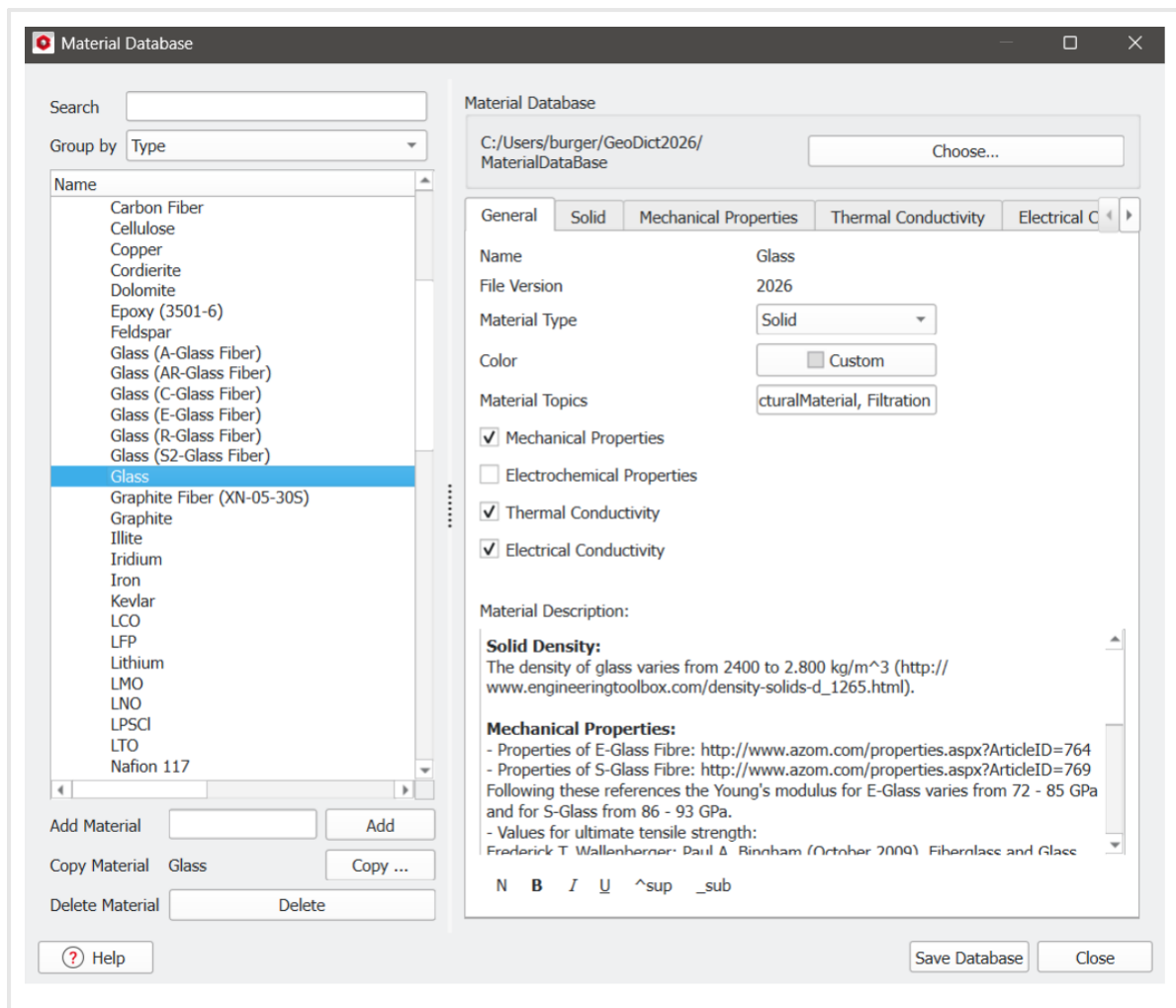


- Click any material button in generator or predictor modules, and then click **Open & Edit Material Database** in the **Material Selector** dialog box

Material Database: Edit and expand the GeoDict material database

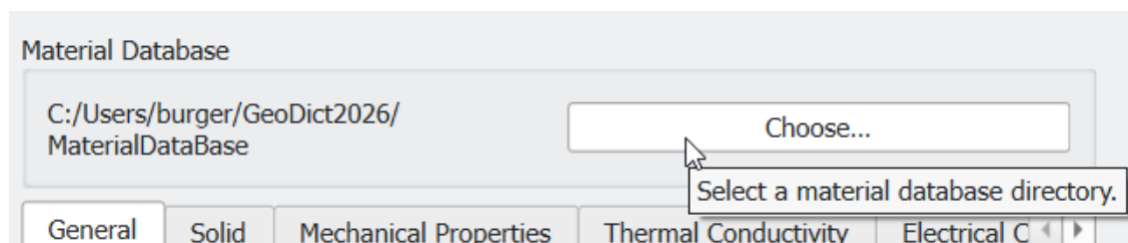


After clicking **Open & Edit Material Database**, the **Material Database** dialog opens:



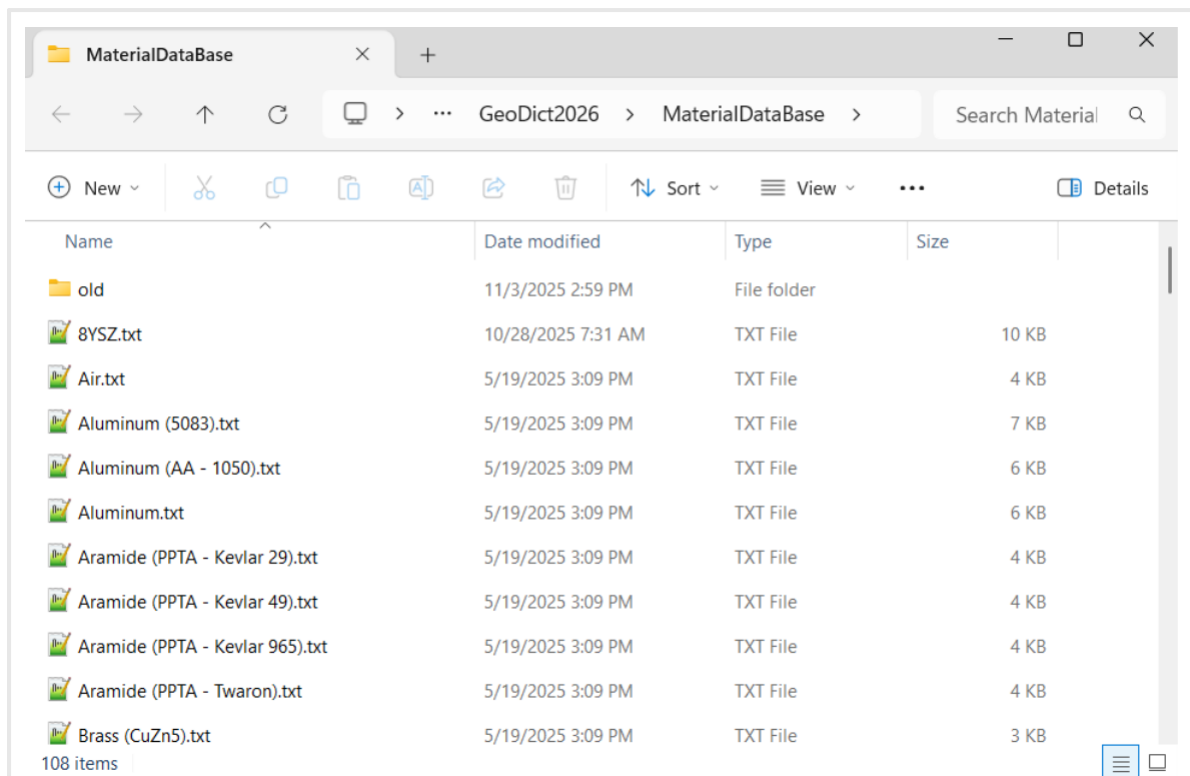
✓ Choose a Material Database

In the upper right corner of the **Material Database** dialog, click **Choose...** to select a material database. A material database is a folder containing various *.txt files, one for each material (see [Saving the material to the database](#)^[42]). Selecting a material database thus means to set the path to a material database directory.



The default path for the supplied GeoDict Material Database is

- C:\Users\username\GeoDict20XX\MaterialDataBase for Windows
- /home/username/.geodict20XX/MaterialDataBase for Linux



If the default material database needs to be recovered, it can be copied from the GeoDict installation directory, e.g., from:

This PC > OS (C:) > Program Files > Math2Market GmbH > GeoDict 2026 >

An arbitrary folder can be chosen as Material Database. For example, a shared network folder could be chosen as material database folder. This way, the same database can be accessed by multiple GeoDict users.

If the current material database folder is deleted, it is automatically recovered from the installation folder at the next start of GeoDict.

Materials can be added to the Material Database in two ways:

1. Add or copy materials in the material database dialog (please refer to the chapter [Adding new materials to the database](#)^[37])
2. Copy the corresponding *.txt files from another material database into the MaterialDataBase folder.

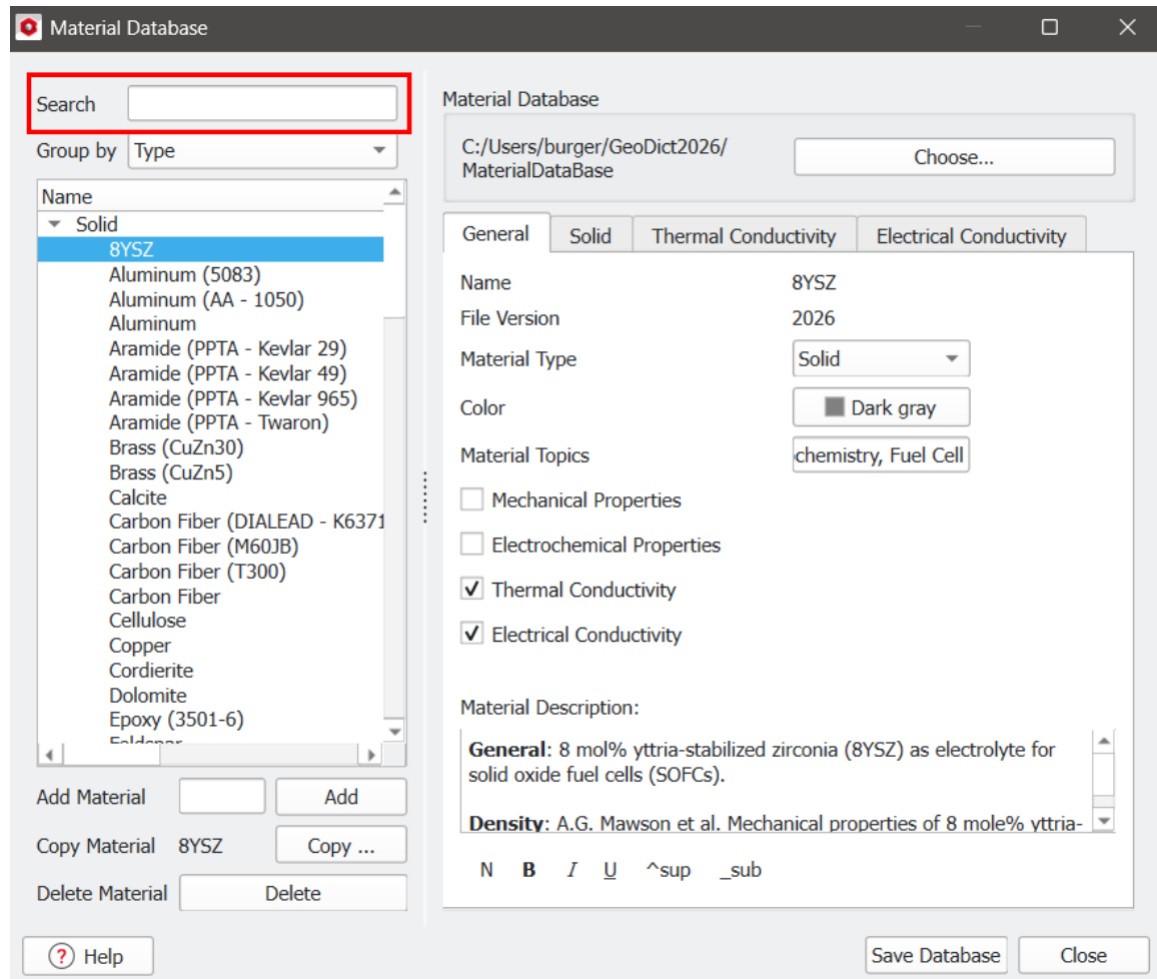
In this way, it is also possible to create a new material database with materials that are not shipped with GeoDict.

✓ How to use the Material Database

The GeoDict Material Database dialog consists of two main panels. In the panel on the left side materials can be searched, grouped, added or copied (please refer to chapter [Adding new materials to the database](#)^[37]) or deleted. On the right side, the currently

chosen material can be edited (please refer to chapter [Edit existing material database entries](#)²⁸).

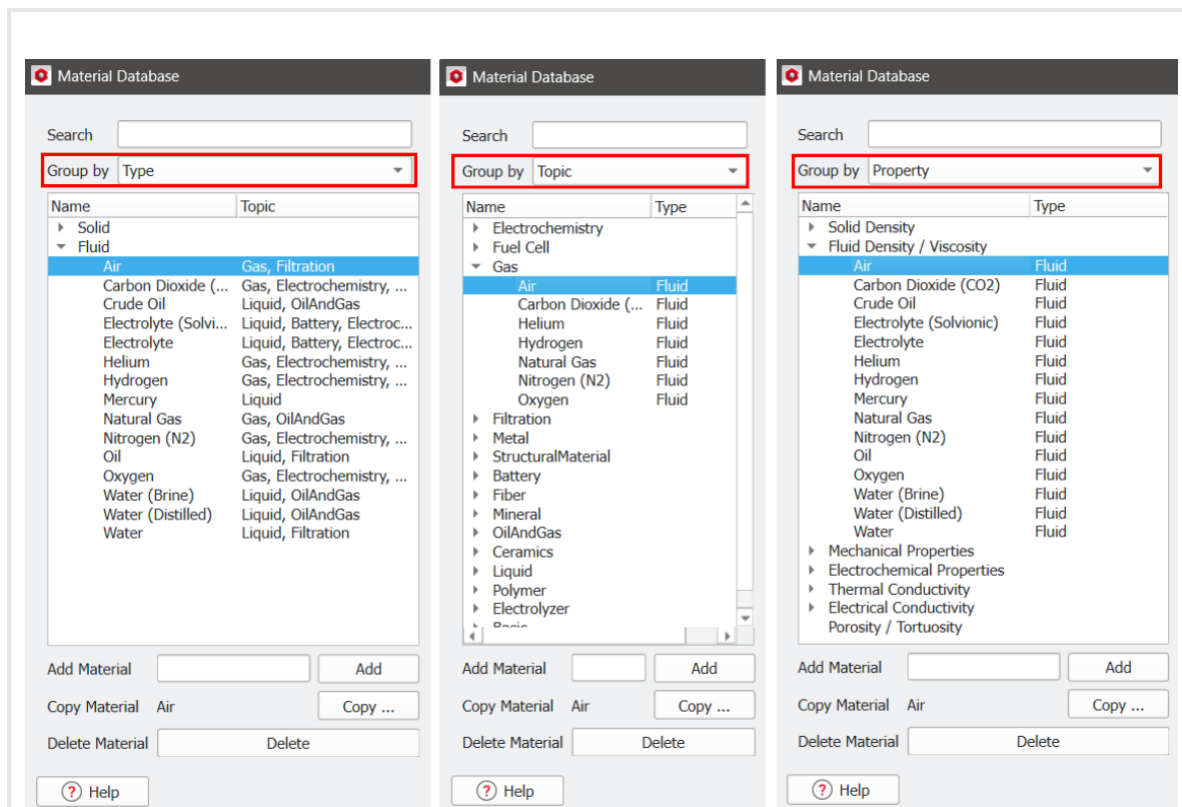
The material database can be searched with the search box at the top of the material database dialog.



Additionally, the materials can be grouped by **Type**, by **Topic** or by **Property**.

The **Types** are GeoDict's material categories (**Fluid**, **Solid** and **Porous**), while the **Topics** can be user-defined (see also section [Edit existing material database entries](#)²⁸).

When choosing **Property**, all materials are grouped for which a corresponding property is defined.



Clicking on a material selects this material and its list entry is highlighted in blue.

With the **Delete** button the selected material is removed from the chosen material database. This means the *.txt file is deleted from the material database folder.

The **Help** button gives directly access to this User Guide.

After editing is done, click **Save Database** to save the changes to the database (see also [Saving the material database](#)⁴²) and close the Material Database dialog window by clicking on **Close**.

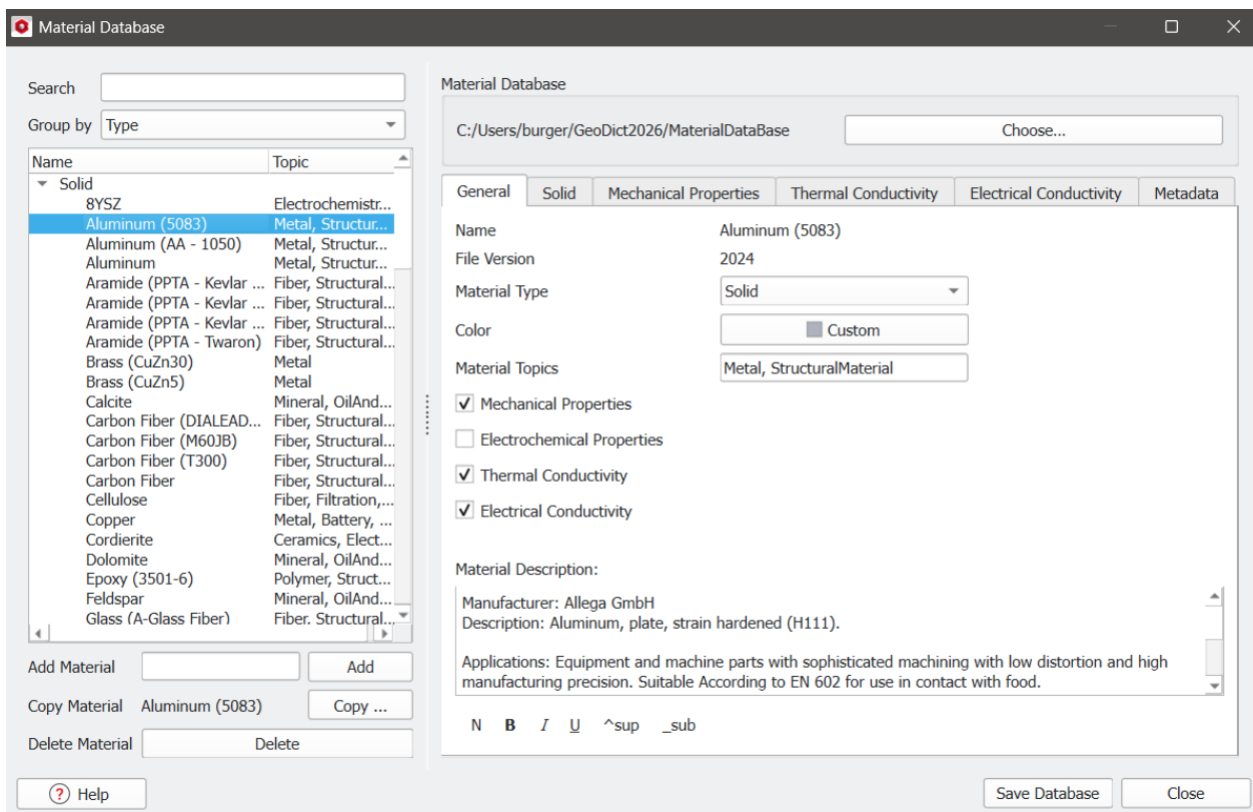
Topics of this section

- [Edit existing material database entries](#)²⁸
Learn how to edit the material parameters.
- [Adding new materials to the database](#)³⁷
Learn how to create new materials, either from scratch or by copying existing materials, and how you can save the material database.

1.3.1 Edit existing material database entries

The material database can be edited by modifying or adding properties of constituent materials through the **Material Database** dialog.

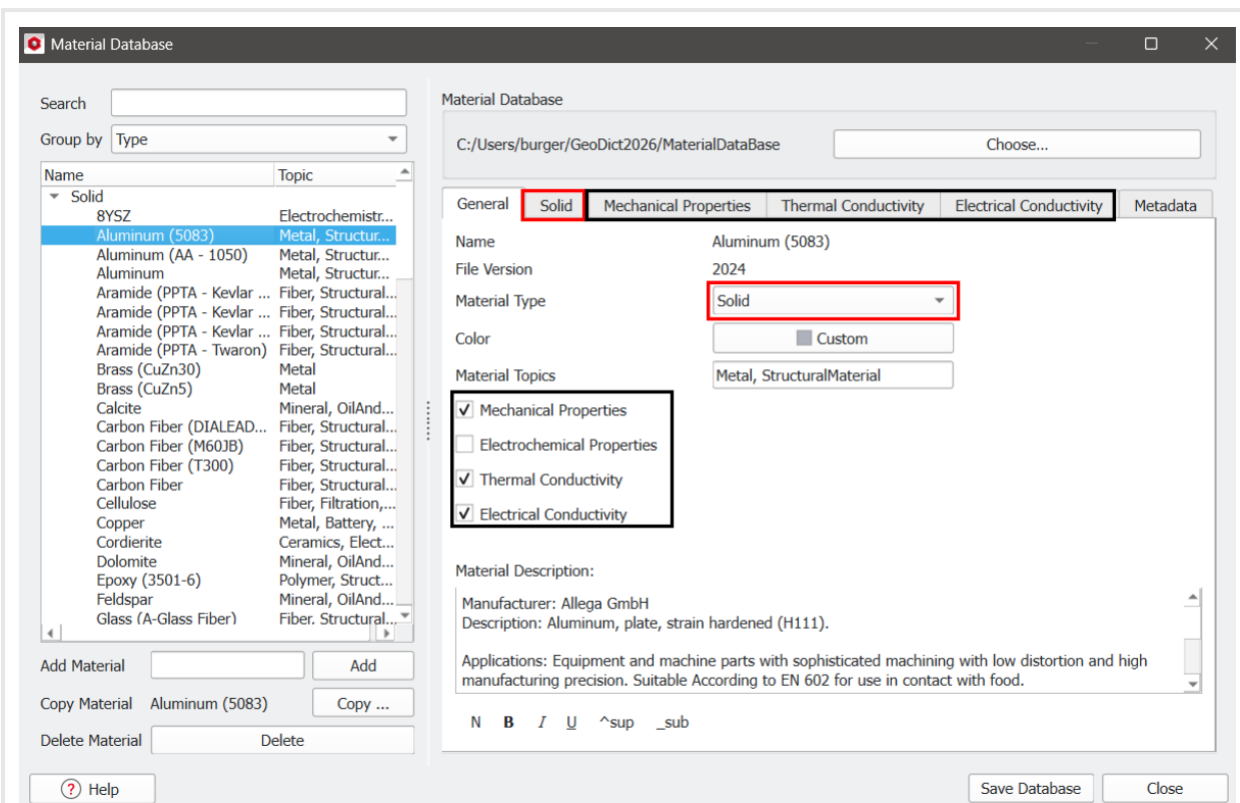
In the left panel, click to highlight and choose one of the materials in the current GeoDict material database. All material parameters and information are displayed on the right panel, organized in multiple tabs.



✓ General

Under the **General** tab, the **Material Type** (Solid, Fluid, Porous), its assigned **Color**, the **Material Topics** (e.g., Battery, Electrochemistry), the material **Properties**, and the **Material Description** can be edited.

The choice of material type and its properties in the **General** tab determines which tabs are visible and therefore editable.



There are three different **Material Types** available in GeoDict:

- For a **Fluid**, the density and the dynamic and kinematic viscosity are defined in the Fluid tab. Additionally, **Mechanical Properties**, **Electrochemical Properties**, **Thermal Conductivity**, and **Electrical Conductivity** can be selected as optional parameters.

Density, Dynamic Viscosity, Kinematic Viscosity, Thermal Conductivity and Electrical Conductivity can be temperature dependent, and the mechanical properties contain the option to add a thermal expansion coefficient.

General Fluid

Name Water

File Version 2026

Material Type Fluid

Color Custom

Material Topics

☐ Mechanical Properties

☐ Electrochemical Properties

☐ Thermal Conductivity

☐ Electrical Conductivity

Material Description:

General: general liquid water to be used for example in filtration applications. The salinity for this material is not defined and no

N B I >>

- For **Solid** materials, only the density must be defined in the Solid tab. Additionally, **Mechanical Properties**, **Electrochemical Properties**, **Thermal Conductivity**, and **Electrical Conductivity** can be selected as optional parameters.

Density, Thermal Conductivity and Electrical Conductivity can be temperature dependent, and the mechanical properties contain the option to add a thermal expansion coefficient.

The screenshot shows a software window with two tabs: 'General' and 'Solid'. The 'Solid' tab is active. The form contains the following fields and options:

- Name:** 8YSZ
- File Version:** 2026
- Material Type:** A dropdown menu showing 'Solid'.
- Color:** A color selection box showing a dark gray swatch and the text 'Dark gray'.
- Material Topics:** An empty text input field.
- Checkboxes:** Four unchecked checkboxes are listed: 'Mechanical Properties', 'Electrochemical Properties', 'Thermal Conductivity', and 'Electrical Conductivity'.
- Material Description:** A text area containing the text 'General: general liquid water to be used for example in filtration'. Below the text area are formatting icons: 'N' (Normal), 'B' (Bold), 'I' (Italic), and '>>' (Align Right).

- **Porous** materials have the same options as **Solid** materials plus porosity and tortuosity, which has to be set in the **Porosity and Tortuosity** tab. Additionally, **Permeability** can be defined.

The Porosity and Tortuosity cannot be set to be temperature dependent

The screenshot shows a dialog box with three tabs: 'General', 'Solid', and 'Porosity and Tortuosity'. The 'Solid' tab is selected. The 'Name' field contains 'Material_New' and the 'File Version' is '2026'. The 'Material Type' is set to 'Porous' in a dropdown menu. The 'Color' is 'Dark gray' with a corresponding color swatch. Below these are five unchecked checkboxes: 'Permeability', 'Mechanical Properties', 'Electrochemical Properties', 'Thermal Conductivity', and 'Electrical Conductivity'. A 'Material Topics' text box is empty. At the bottom, there is a 'Material Description' text area with a rich text editor toolbar showing 'N', 'B', 'I', 'U', and '>>'.

✓ Solid and Fluid Properties

Depending on the chosen Material Type, the second tab is called Solid (for Solid and Pore) or Fluid (for Fluid). Here, the density and, for fluids, the dynamic and kinematic viscosity are defined. Multiple Material Laws can be created for different application cases or physical conditions. For example, the physical properties may change for varying pressure values. Thus, for different pressure values an individual material law can be defined.

In the Density Selection panel select a material law from the drop-down menu.

The screenshot shows the 'Density Selection' panel. It has two buttons on the left: 'Edit Material Law' and 'Add Material Law'. A dropdown menu is open, showing a list of material laws: 'Pressure = 68.95 bar [1000 psia]', 'Pressure = 68.95 bar [1000 psia]', 'Pressure = 27.58 bar [400 psia]', 'Pressure = 41.37 bar [600 psia]', and 'Pressure = 48.26 bar [700 psia]'. The first two entries are highlighted in blue. To the right of the dropdown are three buttons: 'Delete', 'Rename', and 'Add'.

Below, the current values are shown and can be edited. The selected material law can be deleted with **Delete** and a new name can be given with **Rename**.

To create a new material law, type its name in the **Add Material Law** box and click **Add**. Then, the values can be entered below and a material law with the entered name is listed under **Edit Material Law**.

Density Selection

Edit Material Law Pressure = 68.95 bar [1000 psia] Delete Rename

Add Material Law New_MaterialLaw Add

From the **Parameter** drop-down menu choose if the density (and viscosity for fluids) should be temperature dependent or not. In the latter case, simply enter the corresponding values.

Density Selection

Edit Material Law New_MaterialLaw Delete Rename

Add Material Law Add

Parameter None

Density / (kg/m³) None

Dynamic Viscosity / (kg/(ms)) 0

Kinematic Viscosity / (m²/s) nan

For the parameter **Temperature**, a table allows to enter the corresponding density and viscosity values for different temperature values. This table can be saved as ASCII *.txt file and such a file with values can also be loaded into the material database.

Density Selection

Edit Material Law New_MaterialLaw Delete Rename

Add Material Law Add

Parameter Temperature

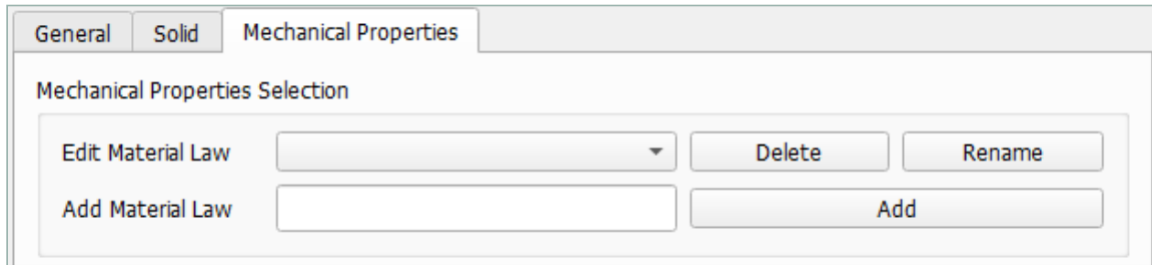
	Temperature / (°C)	Density / (kg/m ³)	Dynamic Viscosity / (kg/(ms))
1	0.0	0.0	0.0

Number of Rows 1

Load... Save...

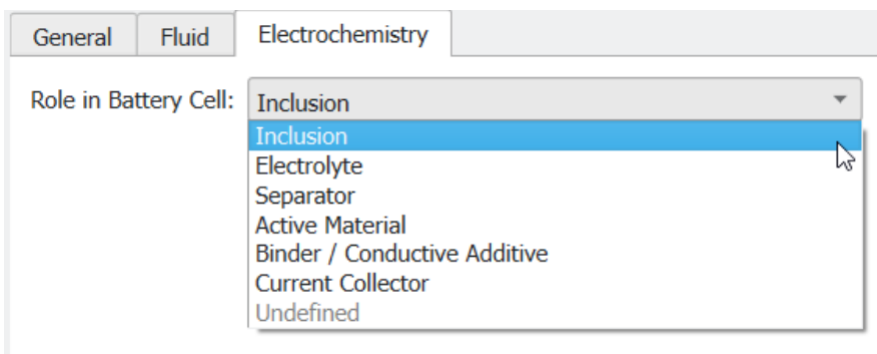
✓ Mechanical Properties

Under **Mechanical Properties**, multiple material laws can be defined. Later, one of them can be selected to run a simulation. For further information about how to define the Mechanical Properties of materials, refer to the ElastoDict user guide.



✓ Electrochemistry

In the **Electrochemical Properties** section, the parameters are set depending on the role of the material in a lithium-ion battery cell. First, select the role from the drop-down menu.



Enter the parameters if necessary. For some roles (e.g., Separator), no parameters need to be entered. More details about the parameters can be found in the [BatteryDict](#) user guide.

✓ Thermal Conductivity

Thermal conductivity is used, e.g., in ConductoDict and can be temperature dependent or not. It can be isotropic, transverse isotropic or orthotropic and the material laws can be edited as described in section [Mechanical Properties](#)^[34]. More information on Thermal conductivity can be found in the ConductoDict user guide.

✓ Electrical Conductivity

Electrical conductivity works analogously to thermal conductivity and details can also be found in the ConductoDict user guide.

✓ Permeability

For porous material, you can decide for the Permeability if it is temperature dependent or not. Leave **Parameter** on **None** for the temperature-independent permeability and choose **Temperature** for the temperature-dependent case. You can enter the constant permeability value in the field **Permeability / (m²)**. In the other case, a table appears in which the interpolation points for the temperature-dependent permeability curve can be entered.

The screenshot shows the 'Permeability' tab with the following settings:

- Parameter:** None
- Type:** Isotropic
- Permeability / (m²):** 0

Additionally, you can define if the Permeability is the same in all directions (**Isotropic**) or can be different in X, Y, and Z direction (**Anisotropic**). In the figure below you can see the Permeability tab for a temperature-dependent anisotropic permeability.

The screenshot shows the 'Permeability' tab with the following settings:

- Parameter:** Temperature
- Type:** Anisotropic

	Temperature / (°C)	Permeability X / (m ²)	Permeability Y / (m ²)	Permeability Z / (m ²)
1	0.0	0.0	0.0	0.0

Below the table, the 'Number of Rows' is set to 1. There are 'Load...' and 'Save...' buttons at the bottom.

Please refer to section Introduction to Permeability of the FlowDict chapter for more information about Permeability in general.

✓ Porosity and Tortuosity

You can enter a percentage value for **Porosity** and a constant value for the **Tortuosity Factor of the Pore-Space**. Since GeoDict 2025, it is also possible to define the **Tortuosity Factor of a Solid Phase**.

✓ Metadata

In the **Metadata** tab, custom properties can be defined, e.g., it is possible to add new physical properties. They can be accessed, e.g., through a Python interface.

Click on **Edit Parameters** to open the **Edit Parameter-Map** dialog. Enter a **Key**, a **Unit**, and a **Value** for this key in the chosen unit. By clicking on **OK**, the metadata will also be saved in the text file for the material as **Parameter Map**.

	Key	Unit	Value
1	Speed	m/s	10
2			
3			

Number of Rows: 3

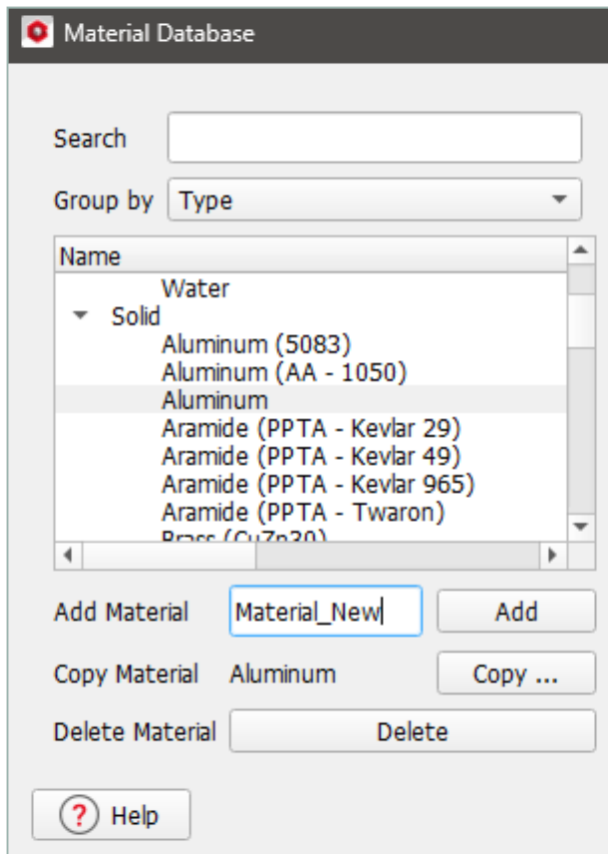
OK Cancel

1.3.2 Adding new materials to the database

The material database can be expanded by adding new constituent materials or by copying (and editing) existing materials in the **Material Database** dialog.

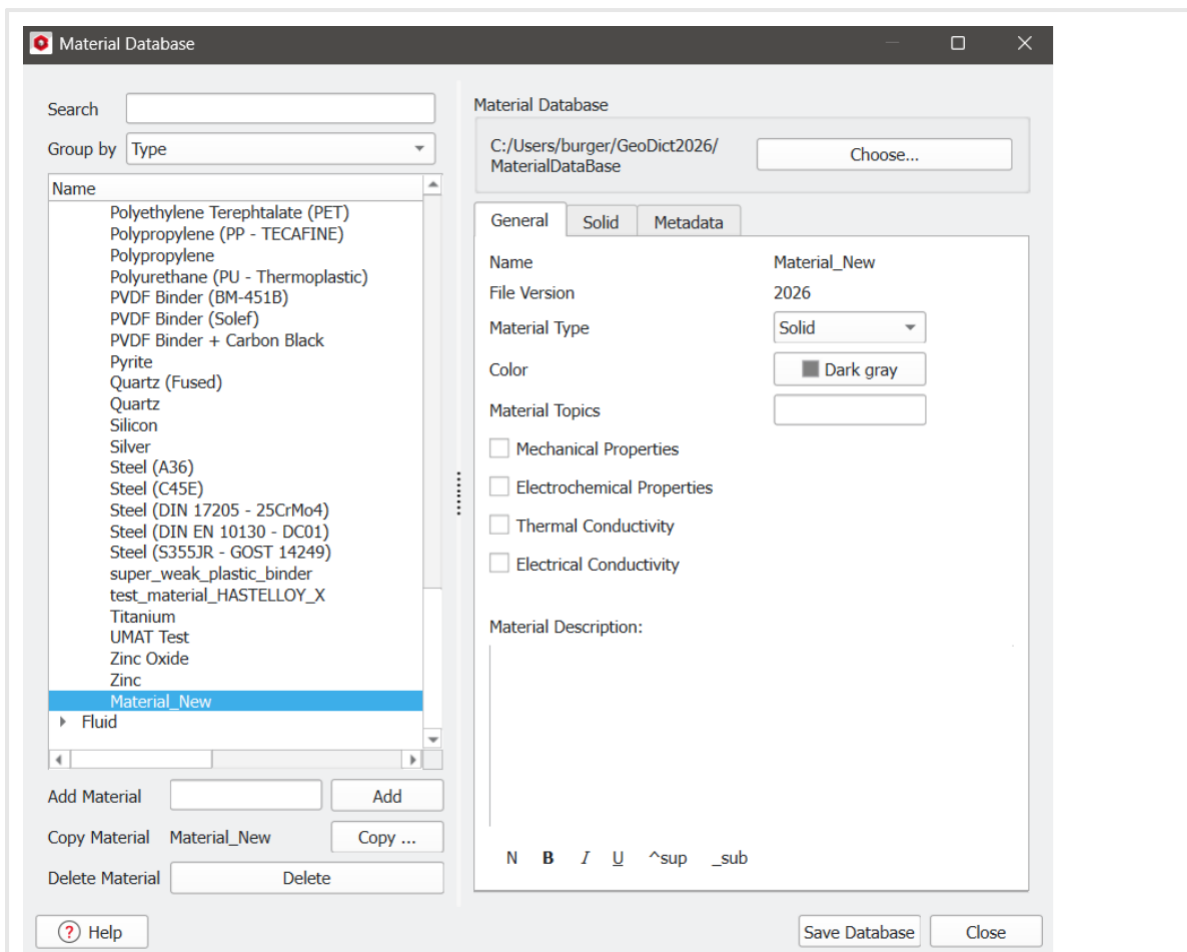
✓ Creating new materials

To add a new material to the database, enter a name for the new material in the corresponding box in the lower left corner of the dialog (e.g., **Material_New** in the example below). Click **Add**.



Material_New appears listed in the left panel and default values appear in the right panel under the **General** and the **Solid** tabs.

When a material is newly created, its **Material Type** is set to **Solid** per default and therefore it appears under the Solid tree listed at the very end.



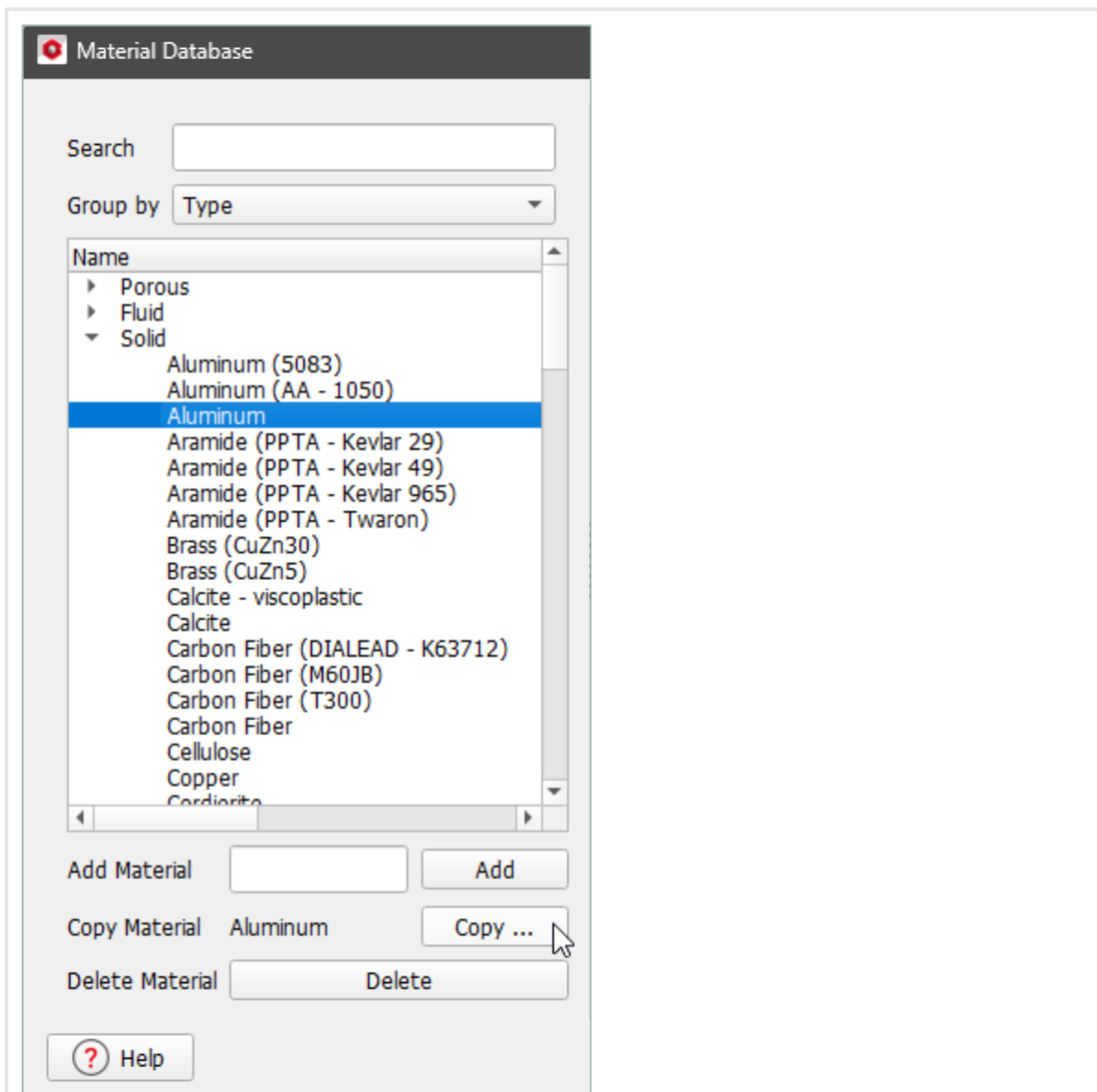
In the next step, the **Material Type** and its properties can be set under the corresponding tabs as described in [Edit existing material database entries](#)^[28].

The choice of material type and its properties in the **General** tab determines which tabs are visible and therefore editable.

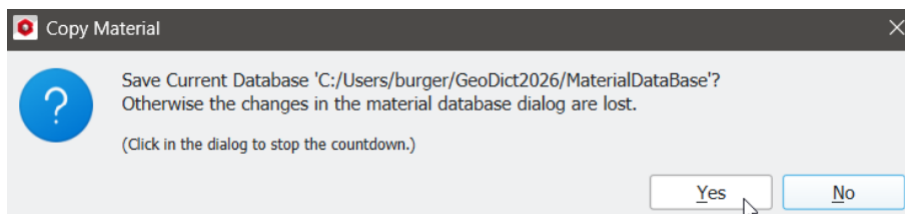
Click on **Save Database** for saving the new material and all settings, see [Saving the material database](#)^[42] for further details.

✓ Copying existing materials

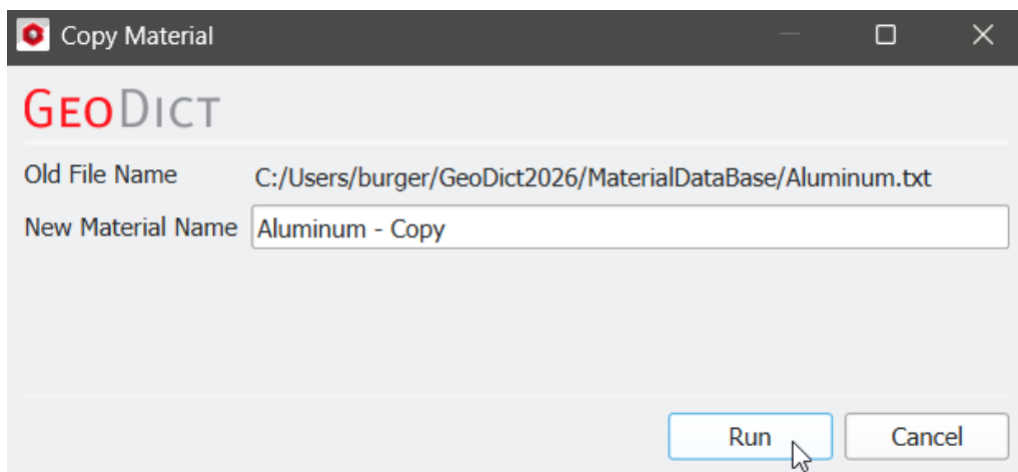
Alternatively, an existing material can be copied by selecting the material and clicking **Copy** With this option all material parameters are still available and don't need to be edited from scratch, but can be modified according to your needs, which is a great benefit.



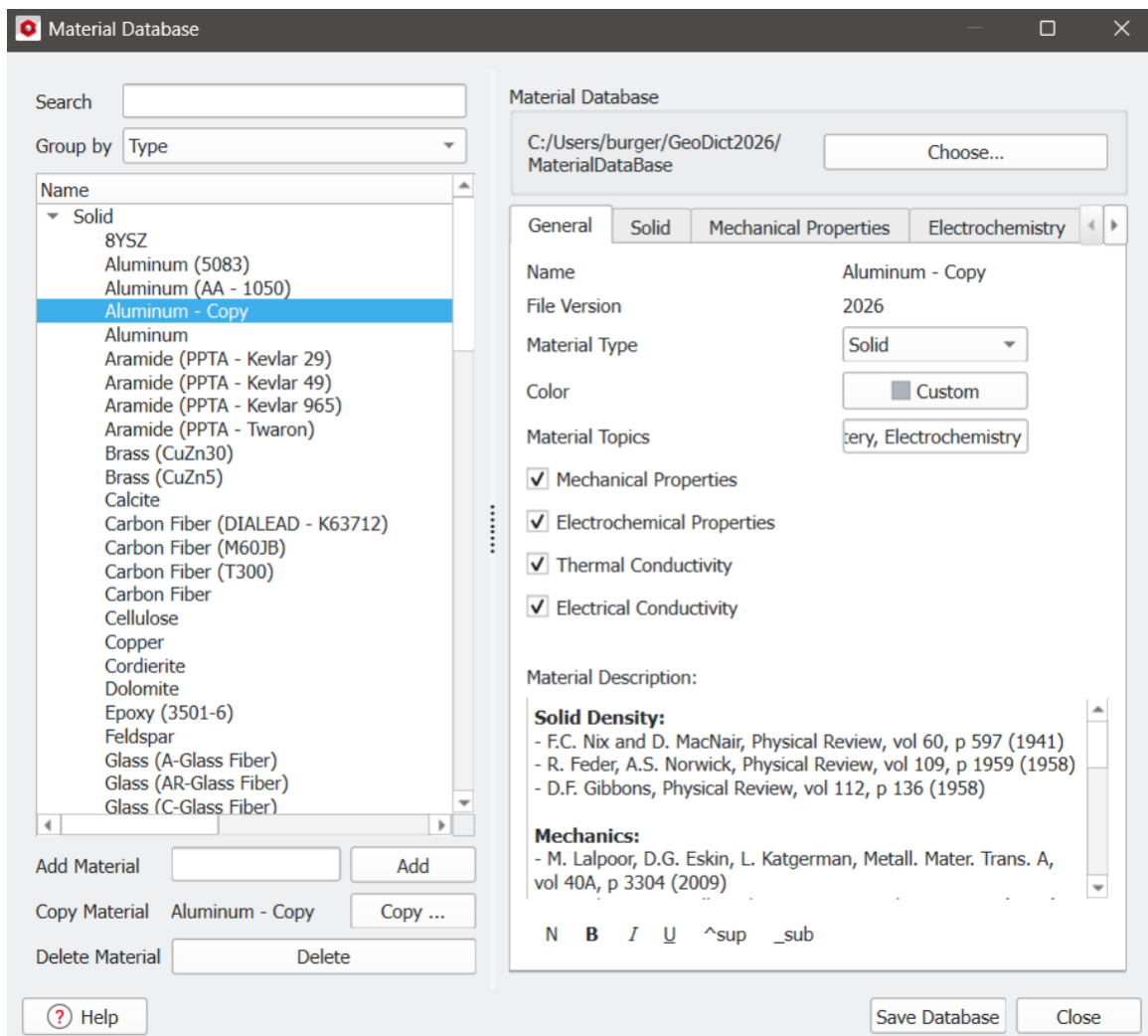
A dialog is shown, which asks if the material database should be saved before adding the copied material. It is recommended to choose **Yes** to proceed.



In the next step, the name for the new copy of the material can be selected. In this example, the default name is kept. Click **Run** to create the material.



Then, the new material is shown in the material database and can be edited as explained before.



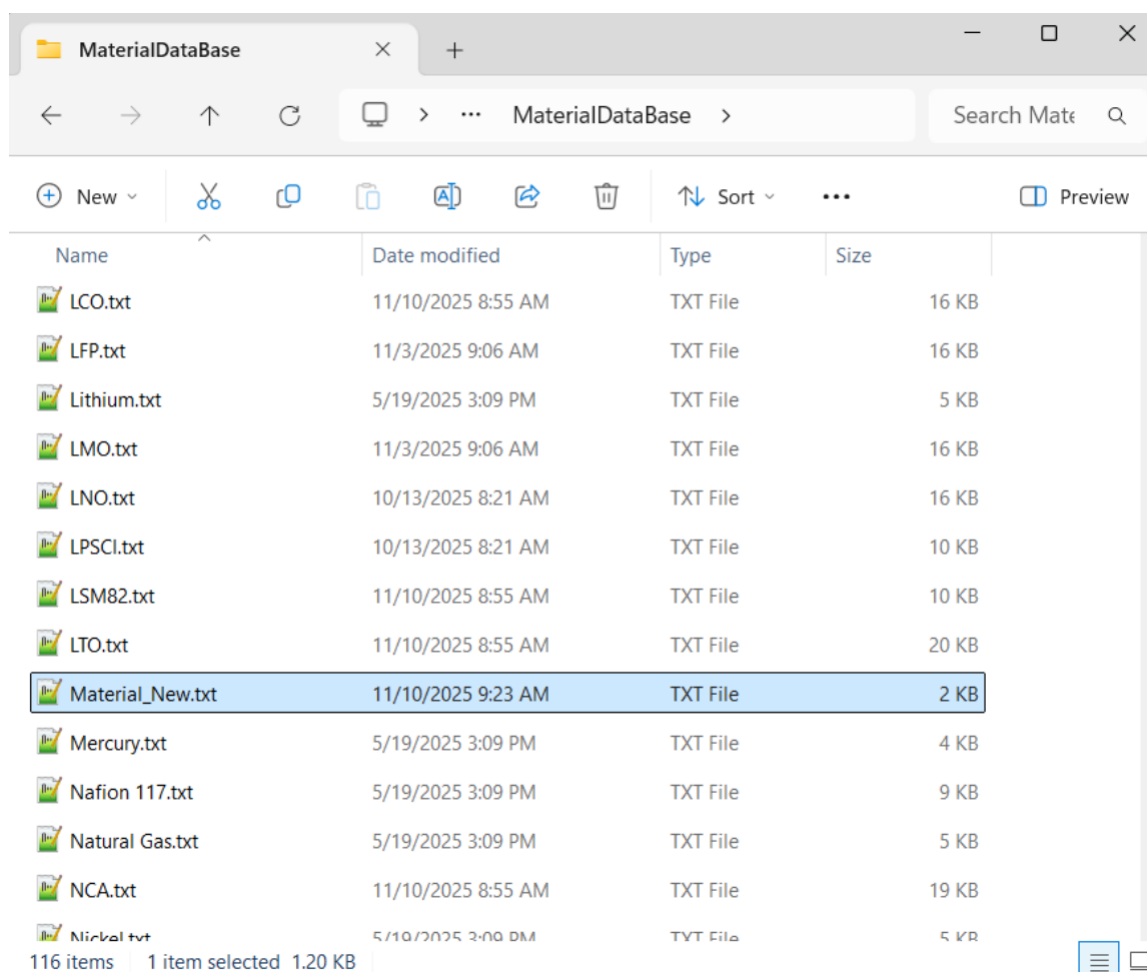
Click on **Save Database** for saving the new material and all settings, see [Saving the material database](#) ⁴² for further details.

✓ Saving the material database

When all parameters are set as desired, either continue with the next material or click **Save Database** at the bottom of the **Material Database** dialog to save all changes to the database.

The material database entries are stored as *.txt files in the current material database folder (either the default GeoDict material database or a user-selected database).

The filename of the *.txt file is the name of the material in the database (here: Material_New.txt). This text file contains all information about the material database entry. It can be shared to other users and copied to other GeoDict material databases.



These text files can be opened and edited with any text editor, such as Notepad++. All parameters can also be changed directly in the *.txt file. As an example, the file for **Aluminum** is shown.

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