Add first material

To add a first material to the newly defined database, the dialog shown in Figure 1 gives three possibilities. The material data can be input manually or imported from a prepared raw material CSV file. For these two possibilities, the user has to define in what form the particle size distribution of the raw material will be given. Furthermore, it is possible to import the first raw material from another database.

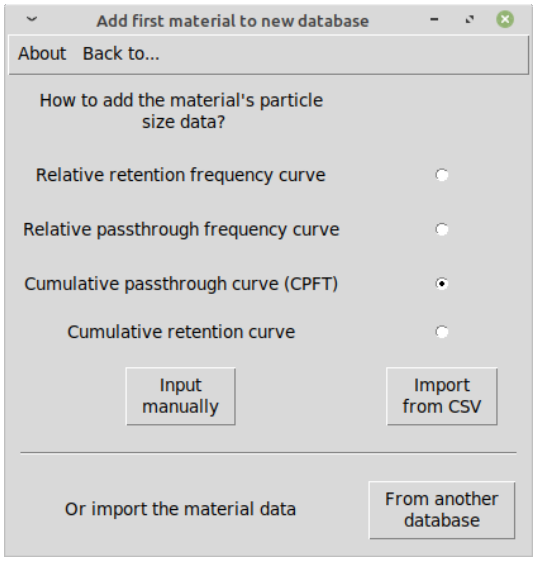
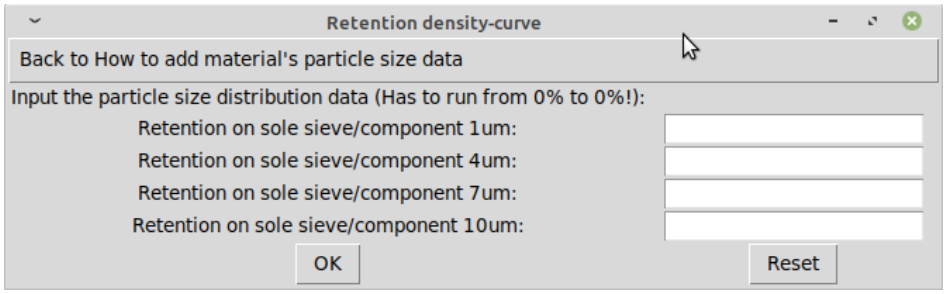


Figure 1: Add first material-dialog

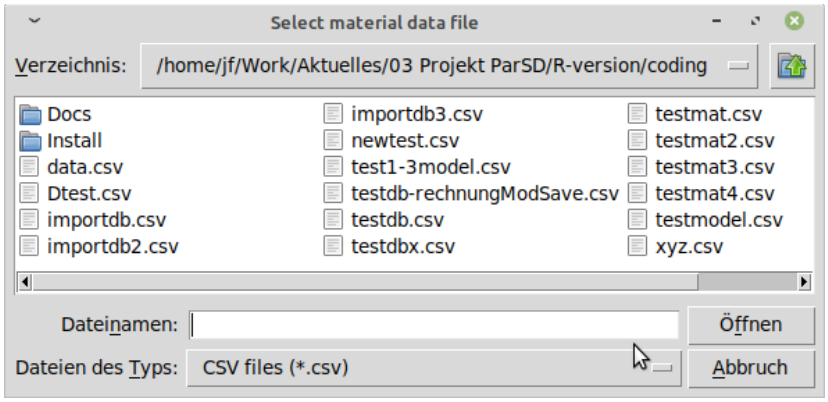
The different types of particle size distributions (relative/cumulative retention/passthrough frequency curves) are explained in the Methodology Documentation and how a prepared raw-material file looks is described in the Technical Documentation. Depending on the type of particle size distribution, the data has to run from 0 % to 0 % for the relative frequency curves or from 0 % to 100 % or vice-versa for the cumulative curves. For the program to work correctly, it is essential that the raw material's minimum particle size is larger than the minimum component size of the database and that the material's maximum diameter is smaller than the maximum component size of the database. Otherwise, the material can obviously not be integrated into the database completely.

If the user inputs the data or imports it from a raw material file, the first step is either to input the data manually (Figure 2(a)) or to choose the raw material file (Figure 2(b)). The data has to be given completely (from 0 % to 0 % for relative frequency curves, ...), but not necessarily for every component size. Values for the missing component sizes are linearly interpolated and the user informed about it (Figure 3(a)). If the particle size data is given for other diameters in the raw material file than the ones defined in the database, the particle size distribution is calculated for the database by linear interpolation. It can be noted that a linear interpolation is directly possible only for a cumulative curve without changing all other values. Therefore, the inputted or imported particle size data is transformed to CPFT-values and then interpolated. After giving the particle size distribution data by inputting or importing, the user is asked to give information about the material (Figure 3(b)).

Predefined fields of the material information are the d(CPFT)-values calculated from the given particle size distribution, the date the raw material was last modified and the unique identifier which is the only mandatory information that has to be given. It is the parameter listed in the dialogs where materials can be selected from a database. All fields can be given or changed. For example, the calculated d(50%) (also referred to as d50-value) could be replaced by the value given in the datasheet

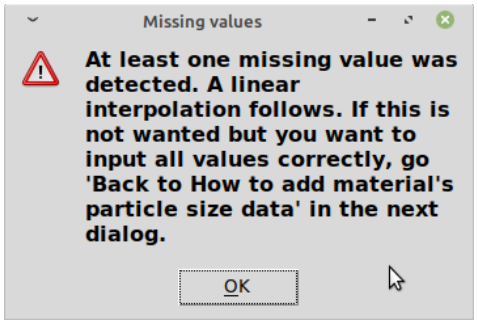


(a) Input manually

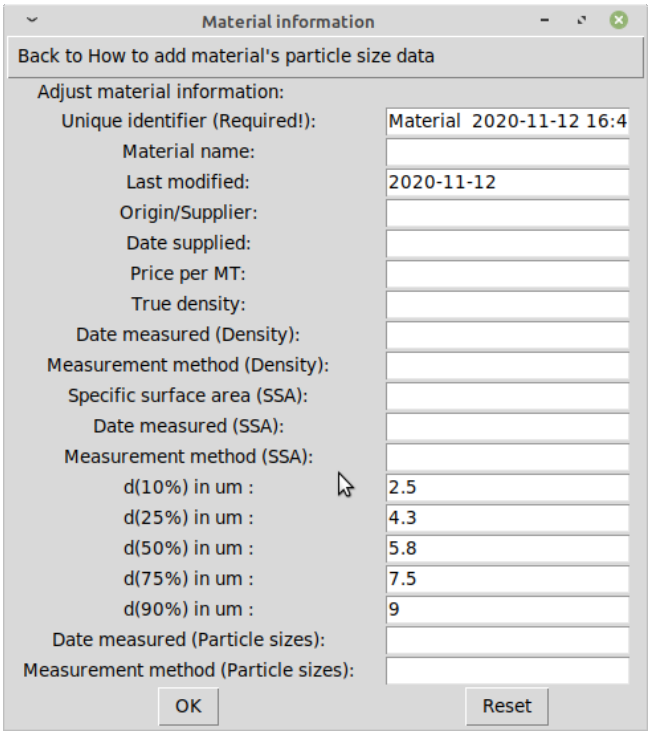


(b) Choose raw-material file for import

Figure 2: Input or import raw material particle size data



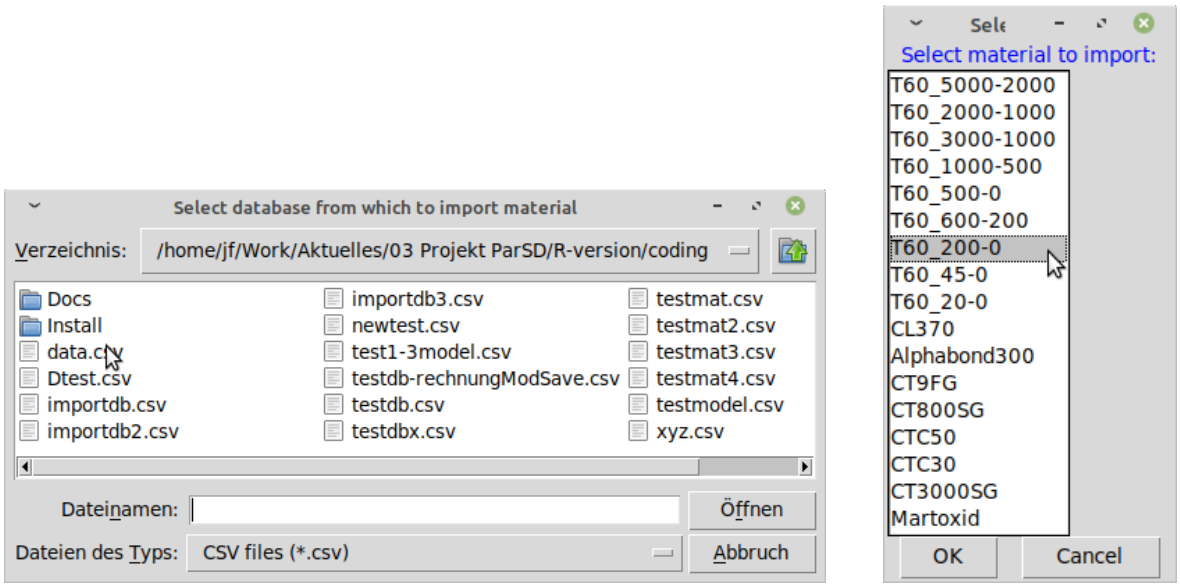
(a) Interpolation message



(b) Defining material information

Figure 3: Possible linearization step and definition of raw material information

of the raw material. For batch analyses in wt%, a true density has to be given. For the database, the units of the given information are not predefined, but have to be consistent within the same database.



(a) Open database with raw material

(b) Select raw material from database

Figure 4: Import raw material from another database

For the fields price, true density, specific surface area and the d(CPFT)-values, only numbers are recognized—other inputs are deleted/blanked for these fields.

If the user imports the material data from another database, the type of the particle size distribution data and the material information have not to be given as both are pre-defined in the database which has to be opened (Figure 4(a)) firstly before secondly the material to be imported is selected from the list of materials in the chosen database (Figure 4(b)). Also in this case, it is important that the particle size range of the material is within the range of the component sizes of the database into which it should be imported. Furthermore, also for this import-function, a linear interpolation follows if required to fit the data to the given set of component sizes in the database.

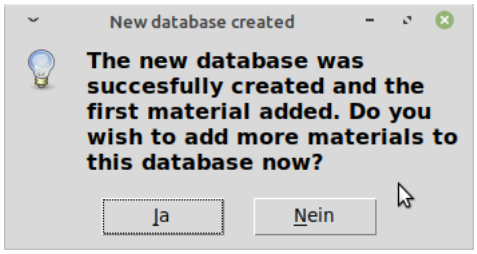


Figure 5: Add another material

Finally, after adding the first material, the database is created and saved. The user is informed after the successful creation and asked if another material should be added, cf. Figure 5. If declined, it is returned to the main window and if accepted, the 'Add material to an existent database' function is called with the just created database as existent one.