



WUIVIEW Materials Database: Read Version

WP - Task	WP4 – Task 4.1	Version ⁽¹⁾	Final
Code (file name)	D4.3_WUIVIEW Database Materials Read Version	Dissemination level ⁽²⁾	Public
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Abstract	There is a great deal of building materials (glass, brick, wood, steel, plastics, fabrics, rubber, etc.) forming vulnerable systems (windows, openings, roofs, decks, etc.) whose thermal properties are well studied and tabulated. This document offers a readable access of the Material Database published in the Deliverable 4.3 - "Database on thermal properties and fire protection characteristics of building materials and systems".
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(1) Draft / Final

(2) Public / Restricted / Internal

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1. About this document

This document explains the access and usability of the WUIVIEW database (readable version) on thermal properties and fire protection characteristics of building materials and systems. The information gathered in such a database will serve as input in FDS (Fire Dynamics Simulator) simulations. Materials included in the database have been selected according to WUI European realities and field observations of past accidents (see Deliverable 5.1). This database is a readable version of the WUIVIEW Database presented in the Deliverable 4.3.

IMPORTANT:

Once unzipped the file WUIVIEW_DB_Materials_Read_Version.ZIP, a folder called “WUIVIEW_DB_Materials_Read_Version” will be created.

This folder should be copied into the path C:\ in order to execute the database. If the folder is not into the correct path, an error messages will be displayed and the database cannot be executed.

It means that the correct path is C:\WUIVIEW_DB_Materials_Read_Version

Then into the folder, users will find two files:

- File 1: Database Report on thermal properties of materials (**REPORT_MATERIALS.accdb**). This file is public and users has access to the information of the reports. Users must use this file in order to query the materials reports. Remember that the correct path to execute is: C:\WUIVIEW_Read_Version\REPORT_MATERIALS.accdb
- File 2: Database on fire protection systems (**WUIVIEW_DB_Materials_READ.accdb**). The content of the internal database the management and content of the database is private. To access this file a password is required.

Next section, a detailed description of the REPORT_MATERIALS database is explained.

2. Use of the REPORT_MATERIALS database

To achieve the WUI building and protective material characterisation (WP4), the task 4.1 of the WUIVIEW project involves collecting data from a large number of materials. To this end, UPC has developed an Access database to gather material properties. This database will enable us to consult useful information about materials in a standardized format.

2.1. How to manipulate the Access Database

This database presents an intuitive user interface. Find below a brief explanation on how to use it.

2.1.1. Open the database

To work with this database, it is necessary to have the Microsoft Access database management system installed. Once this software has been installed, run the file called “**REPORTS_MATERIALS.accdb**”. Once the new database application has been opened, click on the “Enable content” button at the top of the start form (see Figure 1). This will enable code and unsafe macros in the database and reopen the database application in trusted mode. Depending of the computer and Microsoft access version this step is activated by default.

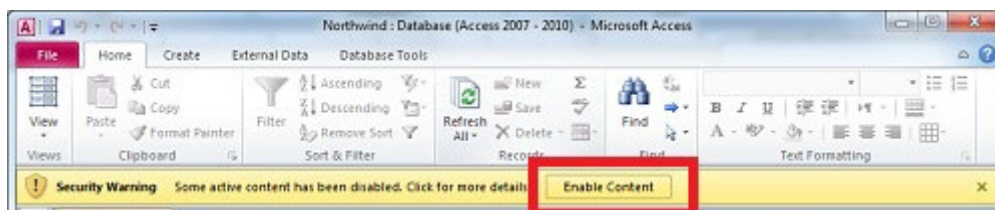


Figure 1. Security warning message to enable the content of the database

2.1.2. Query and report forms

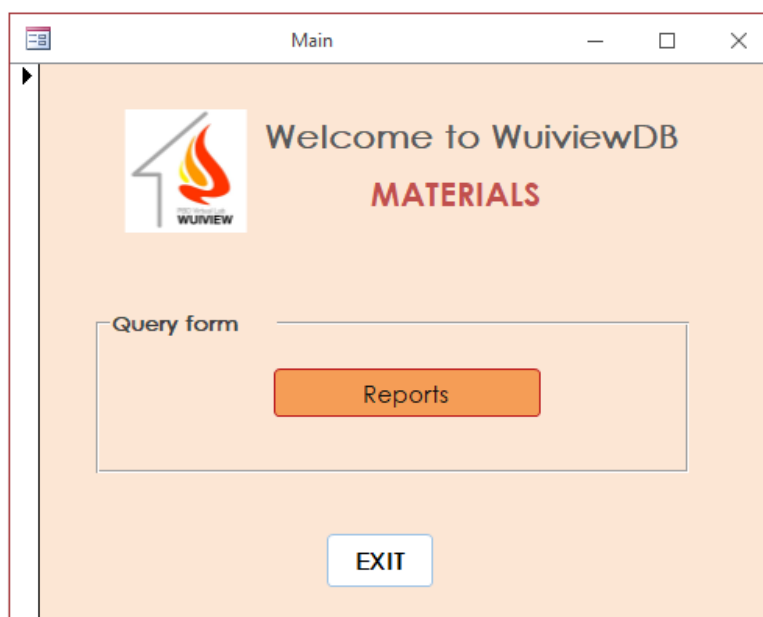


Figure 2. Welcome to WuiviewDB Materials

Figure 2 shows the main menu window of the database. To access to the query form and visualize all the reports, users should press the **Reports** button within the Query form panel.

Next step consists on selecting the type of report to generate between two options: a) The complete list of material types sorted by categories gathered in the database; b) the report containing all the information of a material type. Forms will be generated either in pdf or excel format. A screenshot with this two options is depicted in Figure 3.

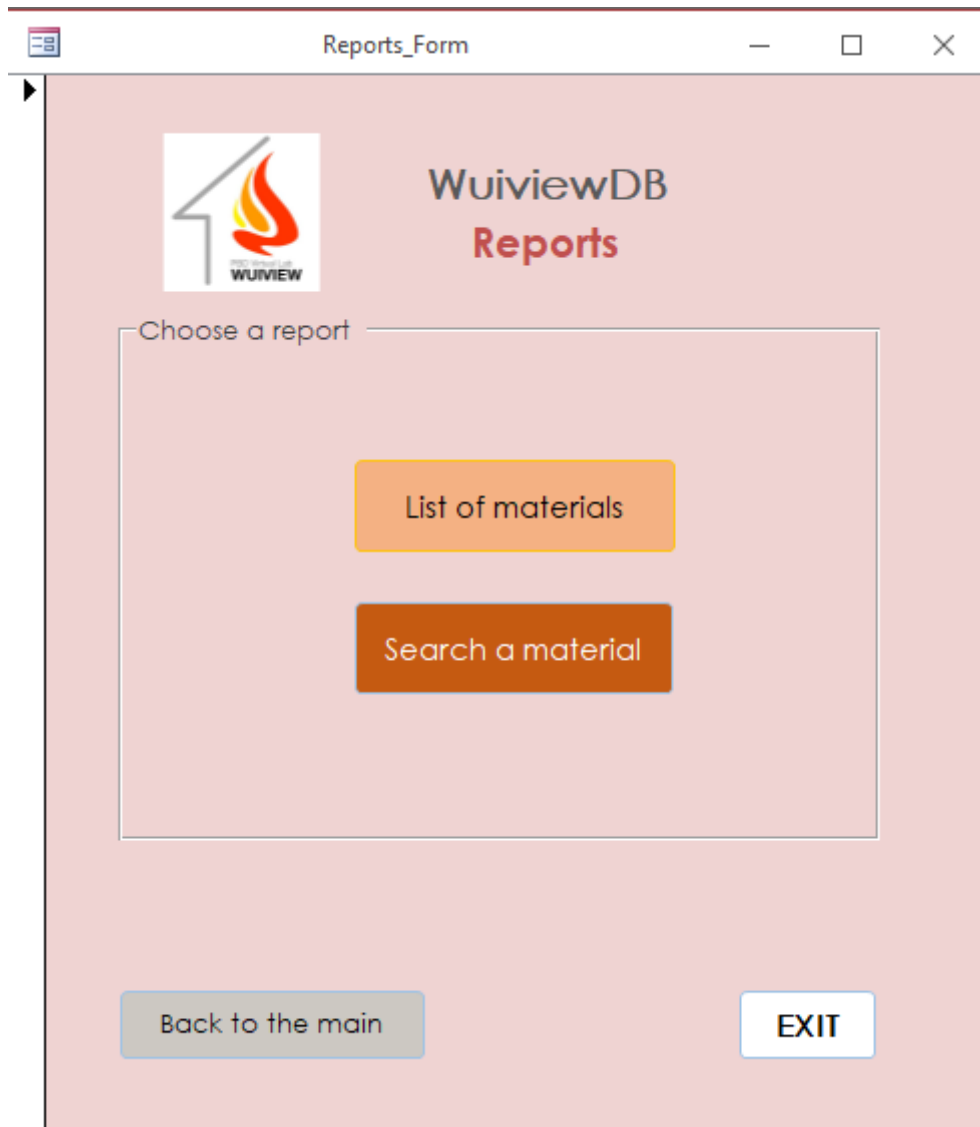


Figure 3. Users have two options (list of materials and search a material) to generate a report form

2.1.3. List of materials

List of materials

Pressing the button a list of all the materials sorted by category is automatically generated. Figure 4 shows an example of the window form with the generated report.

Report_List_Materials	
Category	Material
Fireproof	Vermiculite, flakes
Fireproof	Fire Brick
Fireproof	Lightweight cement coating (Cafco)
Fireproof	Epoxy intumescent coating (International Protective Coatings)
Fireproof	Silica blanket (Insulcon)
Glass	Plate (soda lime)
Glass	Pyrex
Glass	Float glass
Glass	Toughened glass
Glass	Reinforced glass
Glass	Tempered safety glass (TSG)
Glass	Laminated safety glass (LSG)
Glass	Printed glass
Masonry	Brick, common
Masonry	Clay tile
Masonry	Cement Mortar

Figure 4. Example of the generated report with the list of the materials sorted by category.



On the top menu of the window, two options allow the users to export this information: printing and generating the content in a file. After pressing the corresponding button, users must select the format file such as EXCEL file, TXT file, PDF file among others. To come back to the main menu, it is preferable to use the [Back to reports](#) button instead closing the window.

2.1.4. Search a material

This second option allows the users obtaining a detailed content of a material. After pressing the **Search a material** button, a pop-up window is displayed (Figure 5). As it can be seen, a list of all the materials contained in the database and sorted by category is shown. Users must select a material type on the listbox and all the information related with the material will be displayed.

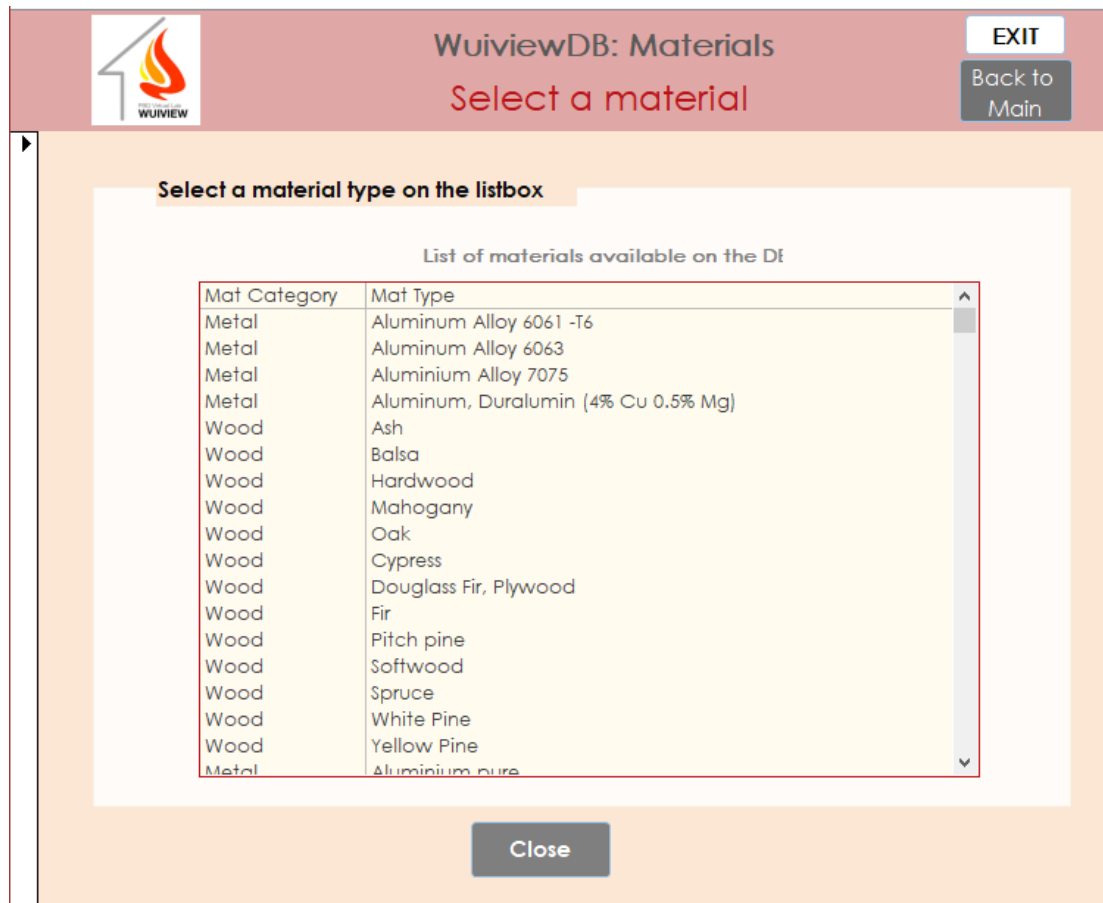






Figure 5. An example of the pop-up window with the list of materials of the database

Figure 6 shows an example of the generated form once the material is selected from the pop-up window. This form is structured in two sections: a) description of the material; b) list of all the associated properties with their content. According to the property type, not all the information fields are filled. In the example of Figure 5, the "Alluminium Alloy 6061-T6" has two properties (*CP* and *K*). In the case of *Cp*, the information is a *Value* type corresponding to 896 J/Kg·K with a *Temperature* of 20°C. Instead, the *K* property is divided in two records. First record corresponds to a *Function* type, and second record is a *Value* type equal to 167 W/m· K with a *Temperature* of 20°C. Moreover, a reference source for each property is displayed.


Report of Material



Back to reports

Material
Aluminum Alloy 6061 -T6

Category
Metal

Description
Precipitation-hardened aluminum alloy, containing magnesium and silicon as its major alloying elements. It has good mechanical properties, exhibits good weldability, and is very commonly extruded (second in popularity only to 6063). It is one of the most common alloys of aluminum for general-purpose use. T6 is a temperate grade (solutionized and artificially aged). It is used for machinery, weaponry, shilding (reference: https://en.wikipedia.org/wiki/6061_aluminium_alloy)



Number of file:

Property	Value	Temp.	Function	Rang	Reference
Cp	896 J/Kg·K	20 C°			Lienhard IV, John H. and John H. Lienhard V. A Heat Transfer Textbook, 3rd Edition. Cambridge: Phlogiston Press, 2006. http://www.mie.uth.gr/labs/ltte/grk/pubs/ahft.pdf

Property	Value	Temp.	Function	Rang	Reference
K	W/m·K	C°	166 - 167 - 172 - 177 - 180	0 - 20 - 100 - 200 - 300	Lienhard IV, John H. and John H. Lienhard V. A Heat Transfer Textbook, 3rd Edition. Cambridge: Phlogiston Press, 2006. http://www.mie.uth.gr/labs/ltte/grk/pubs/ahft.pdf

Property	Value	Temp.	Function	Rang	Reference
K	167 W/m·K	20 C°			Lienhard IV, John H. and John H. Lienhard V. A Heat Transfer Textbook, 3rd

Figure 6. Example of the information related to the material and a list of all the associated properties.

Finally, on the top menu of the window, two options   allow to users to export this information: printing and generating the content in a file. After pressing the corresponding button, users should select the format file such as EXCEL file, TXT file, PDF file among others. To come back to the main menu is preferable to use the Back to reports button instead of to close the window.