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SAFIR® INSTALLATION GUIDE

The present file describes the installation process for SAFIR and the related software:
Preprocesor: GiD,
SAFIR launcher: SafirShell
Postprocessor: DIAMOND.

Table of content

1 General overview

The different software codes to be installed are:

- GiD: general purpose pre and postprocessor for finite element analysis programs. GiD allows the generation of any input file readable by SAFIR for 2D or 3D, thermal or structural problem. In order to use GiD with SAFIR, the GiD-SAFIR Interface has to be installed, as described in this document.

- SAFIR: is given as an executable file. The steps to make it run on a computer are described in this document. SAFIR reads an input ASCII file and provides the results in two ASCII files: one user readable file that can be directly examined in a text editor (.OUT) and one file organized in a XML format to be visualized by DIAMOND.

- SafirShell: a convenient tool that can be used to run SAFIR calculations. The use of SafirShell is optional.

- DIAMOND: the post-processor, used to visualize the results of the calculation performed by SAFIR. DIAMOND reads the file .XML that contains the results of the calculation.

It is assumed that the installation of these software is on a stand alone computer. The procedure is very similar for computer networks with an external administrator. Intervention of the network manager will be required.

SAFIR, SafirShell and Diamond have been produced in a Windows 64 bit Operating System. GID also works in this environment; please check GID web site for other environments.

2 Installing and running SAFIR

SAFIR is delivered in the form of an executable file, for example "SAFIR.exe", and a security file, "identity.key". These files have to be copied on the device on which SAFIR will be found by the CPU of the computer during execution. This could be, for example, a USB key, an external hard disk or, more likely, one of the hard disks of the P.C.

2.1 SAFIR.EXE

Copy the file « SAFIR2019a6.EXE » in a folder on your device. This file can be found in the folder "003_SAFIR_executable".

The word "device" means here a physical support normally designated by a letter in the Windows Operating System. It could be, for example "E:" for a USB key. We will assume here that you choose the main hard disk of your computer "C:"

For example, the file can be copied in "C:\SAFIR\2019a6". You may now rename the executable file into "SAFIR.EXE" as the version is indicated by the folder.

Note: Avoid, for example "C:\PROGRAM FILES\SAFIR\2019" because the blank character may cause problems in GiD.

2.2 IDENTITY.KEYCopy the file "IDENTITY.KEY" <u>in the root directory of the device where you will locate your input files.</u>

Although this is not mandatory, it is good practice to use the same device as the one in which SAFIR is located.

In this example, this would be in "C:\"

2.3 Windows explorer

From here, you can start SAFIR by double clicking on the executable file "SAFIR.EXE" from the Windows Explorer. This will yet require that all your input files are located in the same folder as SAFIR.

Users normally organize their input files in different folders; one folder may for example be used for each different project. In this case, the executable can be copied in each of these folders.

In Figure 1, you can see that the executable "SAFIR2009.exe" is located in the same folder as the input file "HOLE.IN". To run SAFIR from Windows Explorer, double click on the executable file. SAFIR will open a DOS window in which the user is requested to type the file name of the input file ("filename" from the complete name "filename.IN"), see Figure 2.
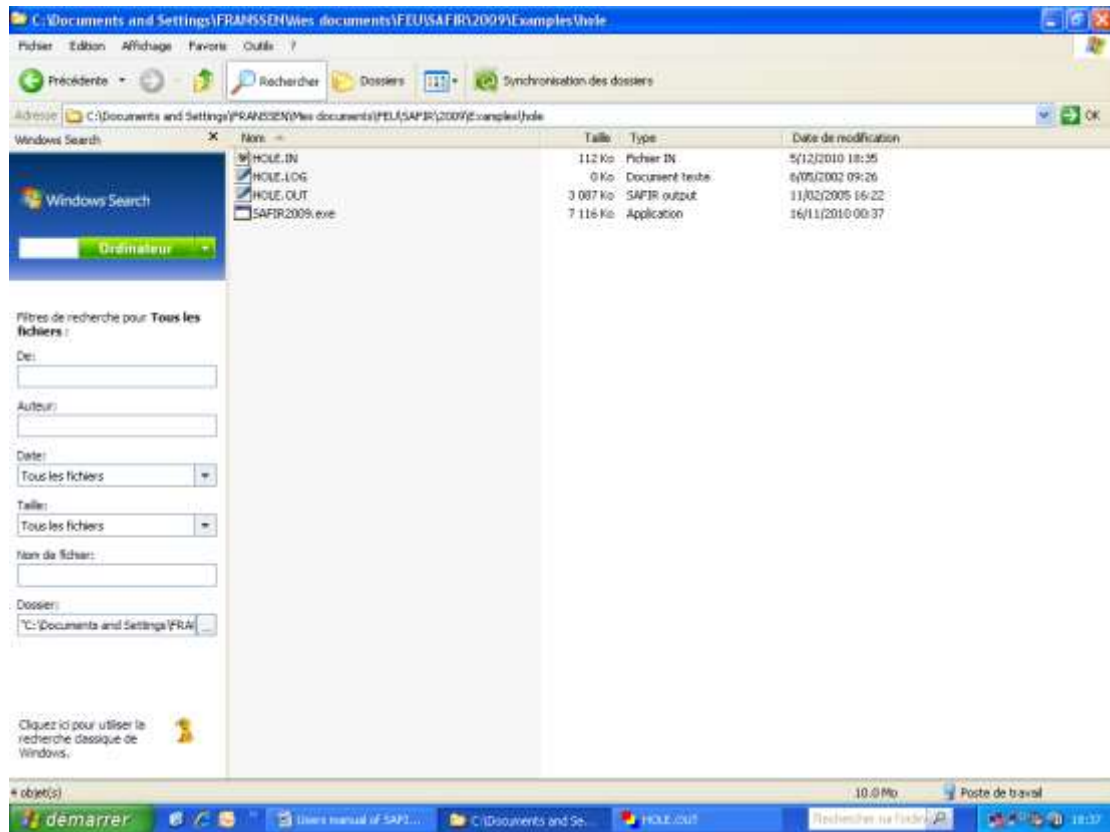
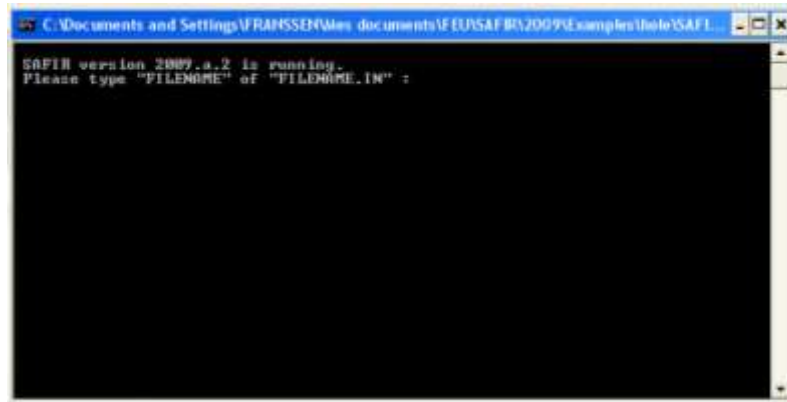**Figure 1 : folder with the executable**

Figure 2 : DOS Windows with the request for the file name

The user has to type the filename, see Figure 3, and press the ENTER key on the keyboard.
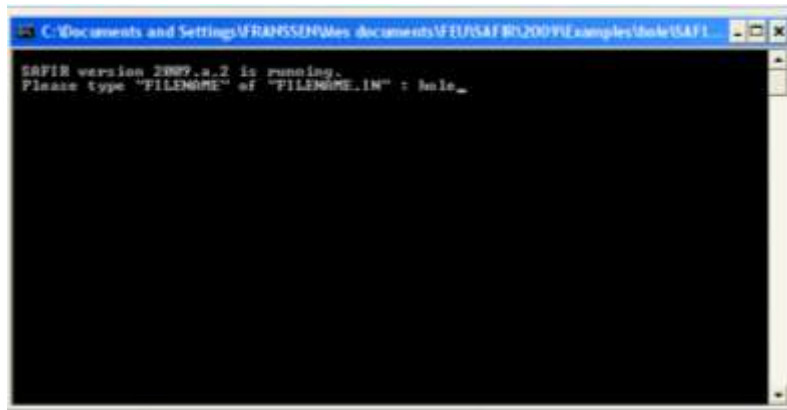
Figure 3 : DOS Windows with the file name

SAFIR starts to run and some messages are written in the DOS window, which allows seeing the progress of the simulation. When the simulation stops, the window is closed immediately. If an error message is written as the last line in the window, it is normally not possible to read it before the window closes. The same message is normally written at the end of the output file.

2.4   DOS command window

To read the error message, an alternative method is to open a DOS command window, go in the folder where the input file and the SAFIR executable are located (Figure 4) and launch SAFIR from this command window, see Figure 5. This command window will not close at the end of the simulation so that it is possible to read the error message, see Figure 6. Figure 7 shows the command window at the end of the simulation, after correcting the input file.
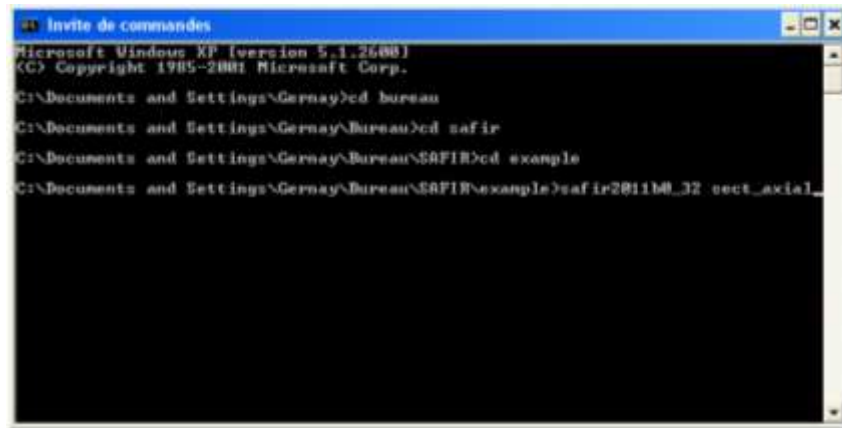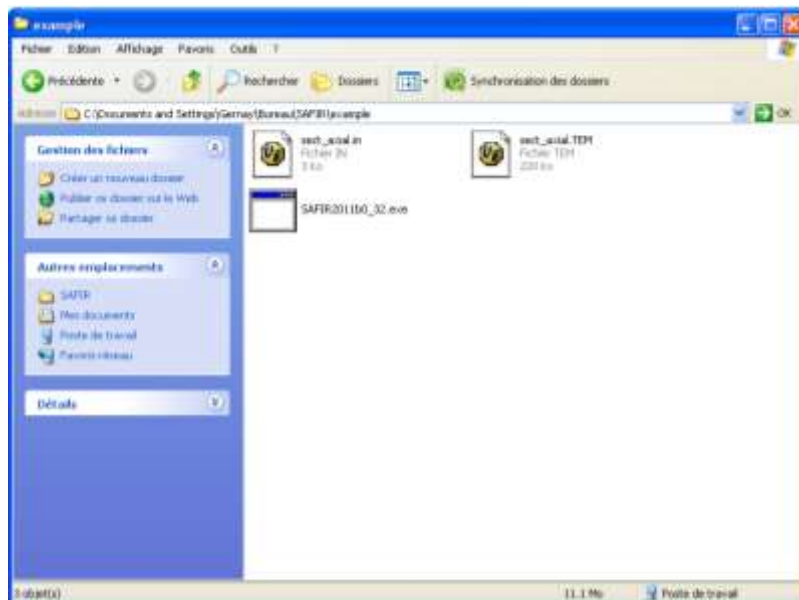

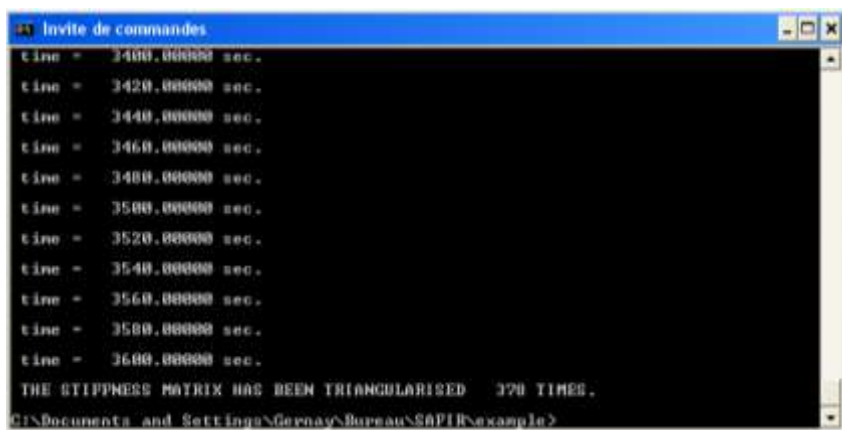**Figure 4 : Folder with the input file and the SAFIR executable**

Figure 5 : SAFIR is launched from the command window

Figure 6 : Command window at the end of the simulation – error in the input file

Figure 7 : Command window at the end of the simulation – correct input file

2.5 Operating System Error

If the version of SAFIR that is launched does not match with the Operating System of the user, an error message appears, see Figure 8. The user tried to launch SAFIR 64 bits whereas its O.S. is 32 bits.

Figure 8 : Error – the SAFIR executable does not match with the user OS

2.6 Libiomp5md.dll Error

Possibly, you may have messages related to the Dynamic Link Library "`libiomp5md.DLL`" because it is either missing on your computer (see Figure 9), or not properly registered or the version that SAFIR is using one your computer is not the one that SAFIR needs (see Figure 10).

Figure 9 : Error – the file libiomp5md.dll is missing, or is not located in the right folder
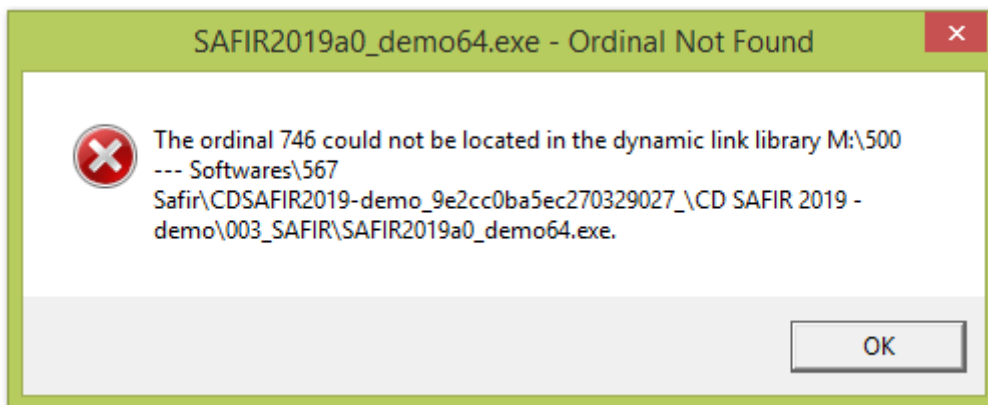

Figure 10 : Error – the file libiomp5md.dll is not the good one

If this is the case, download the redistributable Intel libraries from this web site: https://software.intel.com/en-us/articles/redistributables-for-intel-parallel-studio-xe-2017-composer-edition-for-windows
Choose "Intel® Fortran Compiler 2017 for Windows* - Update 5 redistributable library package", download and unzip this file and run the "ww_ifort_redist… .msi" file that is relevant to your Windows operating system.

2.7 Identity.key Error

If the error message concerns the "`identity.key`" file, the Operating System has everything it needs to run SAFIR, but it cannot find the "`identity.key`" file, see 11 and 12. The problem is thus to locate this "`identity.key`" file in the proper location. This file has to be located in the root directory as explained in section 2.2.
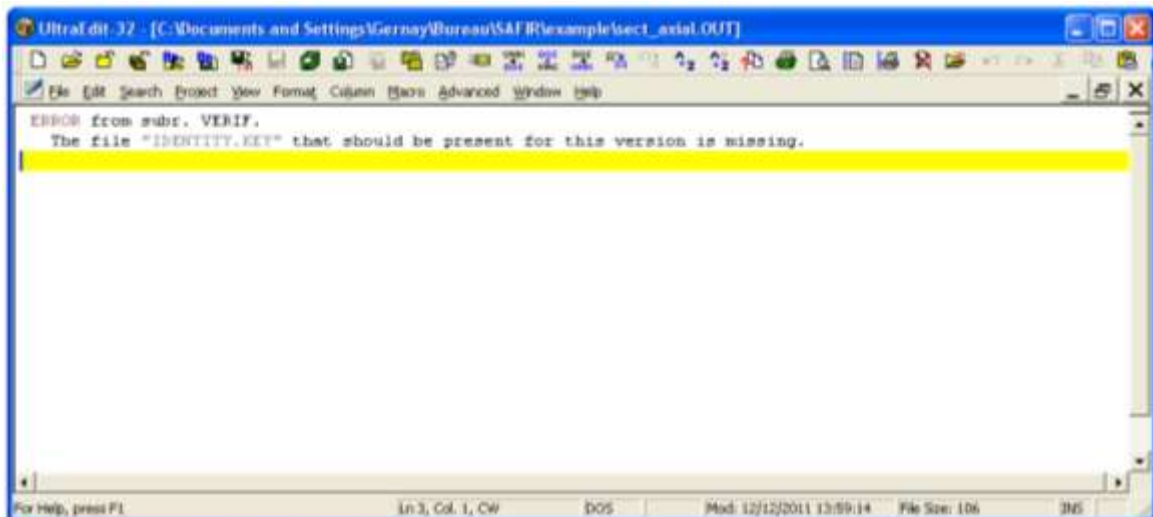
Figure 11 : Error message in the .OUT when the "`identity.key`" file is missing
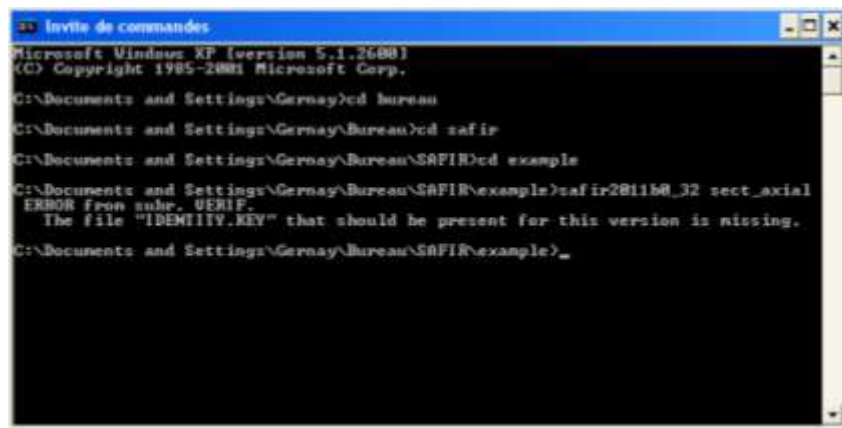

Figure 12 : Error message in the command window when the file identity.key is missing

2.8 Input Files Errors

If none of the above errors appear when double clicking on the executable of SAFIR, it is possible to launch a calculation. First, try with one of the example files given on the SAFIR web site (Select "SAFIR input files" from https://www.uee.uliege.be/cms/c_2673990/fr/safir-free-downloads or from https://www.uee.uliege.be/cms/c_2674002/fr/safir-applications-examples). Copy one input file (.IN) in the same folder as the SAFIR executable on your computer, and launch the calculation as explained above. If the calculation runs correctly, it means that SAFIR is properly installed on your computer.

When SAFIR is properly installed on your computer, the errors that can still appear are due to errors in the input file. If such an error appears, the first step is to read at the end of the output file (.OUT) the description of the error. When trying to fix the problem, please refer to the SAFIR manual and to the FAQ on the SAFIR website (https://www.uee.uliege.be/cms/c_2674107/fr/safir-faq

Please take care to:

1) Identify yourself (name and company/institution), the type of version that you have (a good manner is to show us the content of your `identity.key` file). If you are a student, put your supervisor in Cc of the message.

2) Give a proper description of your problem in the email. Is SAFIR not running or is it giving a result that does not match your idea of what it should be? If, so, how did you get this idea of the supposedly correct solution?
3) Include all files requested for us to reproduce your case. Include screen shots that could help us to understand the problem.

2.9 Using SafirShell

Instead of using directly the executable of SAFIR, a more practical organization can be utilized, based on the use of the tool "SafirShell.exe" that you can install.

When using this new organization, SAFIR is copied in one single folder of the hard disk, for example in the folder "C:\SAFIR\safir2011.b.0" in the screenshot of Figure 13. SAFIR will then have to be run with the tool called "SafirShell". When this tool is started, a window is opened, see Figure 13.
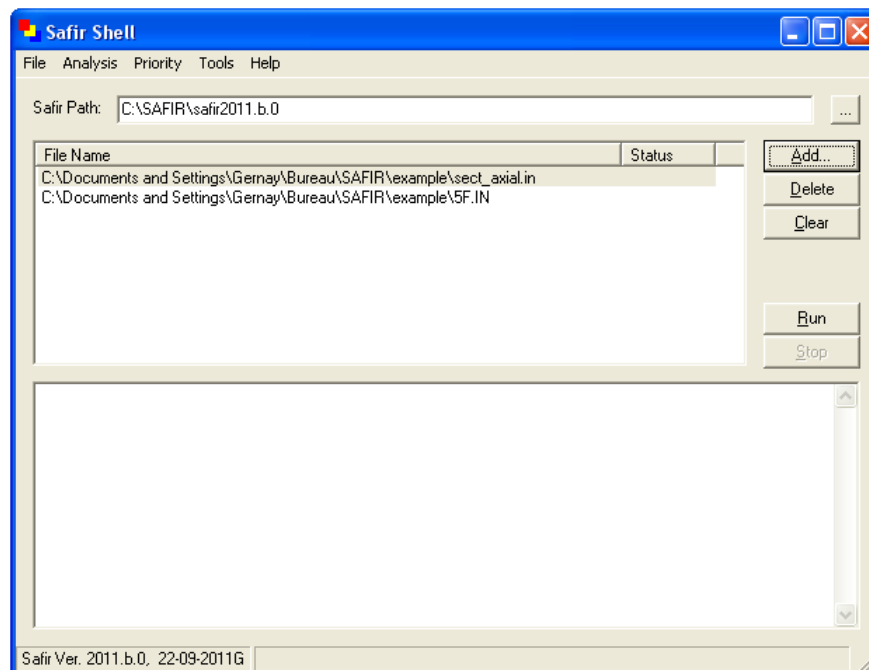

Figure 13 : window of the SAFIRShell

The folder where the executable file of SAFIR is located must be indicated in the "Safir Path" window. This folder can be selected by the user with the […] button on the top right.

The input files that will be treated by SAFIR can be chosen by the user using the [Add..] button. SAFIR will start running as soon as the [Run] button is clicked on.

The advantages of using the SafirShell tool are:

- The executable of SAFIR is present only in one folder on the hard disk (or in one folder for each version of SAFIR if you need to run older version, when coming back to old projects for example).
- Several input files can be chosen and treated in a batch mode, one after the other. If one runs fails for any reason, the next input files will be treated.

- The messages that were written in the DOS window will now be written in the bottom window of the SafirShell and will remain there to be read even after the runs are finished.
- The priority allocated by the Operating System to the SAFIR process can be selected in the Priority scroll down menu. For processors with a single core, it is recommended to choose "below normal" because this will hardly affect the velocity of SAFIR but will allow time enough to be allocated for performing usual office tasks.

3 Installation of SafirShell

This tool is installed by execution of "tools.msi" to be downloaded from https://www.uee.uliege.be/cms/c_2673990/fr/safir-free-downloads.

4 Installation of DIAMOND

Download and run the file "DIAMOND.msi" from the SAFIR website (see "postprocessor"): https://www.uee.uliege.be/cms/c_2673990/fr/safir-free-downloads.

Notes:

1) It sometimes happens that during the installation process an error message appears, stating that "*a dll file is missing*". In this case, just click on "continue" and the installation will go on successfully.

2) It sometimes happens that during the installation process a warning message appears, stating that "*the Windows installer service cannot update the system file*". In this case, just click on "ok" and the installation will go on successfully

3) When starting Diamond, an error may appear on the screen that says "*The file comct332.ocx is missing or not correctly registered*" or a similar message with another .ocx file.

   SOLUTION: Usually, this file is present on the computer, but it has to be registered with administrator's rights.

   The following files may require registration:
   - MSCOMCTL.OCX
   - MSCOMCT2.OCX
   - TTFI6.OCX
   - COMCT332.OCX

Error message	What to do
Run-time error 'XXX': Component 'YYYYYY.OCX'or one of its dependencies not correctly registered: a file is missing or invalid.	1) Open the command prompt as administrator. 2) Type C:\Windows\SysWOW64 3) Type regsvr32 YYYYYY.OCX

5 Installation of GiD

5.1 General description

GiD is a general purpose pre and postprocessor for finite element analysis programs.

GiD provides an interactive graphical user interface similar to a CAD system to define the problem geometry. All conditions, materials, loads and other general solution parameters can be defined on the geometry. When GiD generates the mesh for the finite element program all this information is automatically transferred to the mesh. The advantage of this concept is that, using this associative data structures, modifications can be made on the geometry and the mesh density and when generating the mesh again, all other information will automatically be updated and ready for the analysis run.

GiD can also be customized to run the finite analysis program from SAFIR within GiD and to visualize the results of the analysis. GiD can be downloaded from the web: http://www.gidhome.com/ Here you will also find more information about GiD.

We recommend using GiD version, 12.0.10. In more recent versions, some parametric tools developed for SAFIR may not work anymore.

For test purposes, the academic version of GiD, which is limited to 700 surface and linear elements, can be used.

5.2 Installation of problem types

After installation of GiD on your computer, you have to implement the GiD-SAFIR Interface by following the process described here below.

Important remark: GiD cannot deal with blank space in the names of the folders in which the files are located; when using GiD you must ensure that the path to the folder does not contain any blank space and is not too long.

Download the GiD problemtypes from the SAFIR website (see preprocessor): https://www.uee.uliege.be/cms/c_2673990/fr/safir-free-downloads.

The downloaded folder for the GiD – SAFIR Interface contains the following problem types:

- SAFIR

    Safir_Thermal_2d.GiD : allows basically generating 2D meshes for calculating temperatures in any cross section of beam elements. Quadrilateral and Triangular elements are possible.

    Safir_Thermal_3d.GiD : used to generate 2D meshes for calculating temperatures; is limited to hexahedral (8-node) elements.

    Safir_Structural_2d.GiD : supports beam, truss and spring elements for 2D mechanical calculations.

    Safir_Structural_3d.GiD : supports beam, shell, truss and spring elements for 3D mechanical calculations.

Safir_Thermal_tsh.GiD ; for generating meshes for thermal analysis of shell elements.
Copy or move the downloaded SAFIR directory to the problemtypes directory within the GiD-Installation directory (in general C:\programme\GiD\problemtypes).

Each of the problemtype directories contains a .bat file, which is executed when SAFIR is launched by GiD after GiD has created an input file. The .bat file uses the environment variable SAFIR_DIR to find the executable of SAFIR with the name safir.exe. The executable of SAFIR that is used by GiD must be named "safir.exe".
If the executable has another name you must edit the bat file.
How to set an environment variable is described here below. Alternatively you can edit the .bat file and set the variable SAFIR_DIR within the .bat file.

On your SAFIR CD, a folder called 004_GiD-SAFIR_examples contains solved exercises with a pdf file describing step by step the exercise and the GiD model files, as well as user manuals.

5.3 How to set the environmental variable to link GiD and SAFIR

It is explained here below, by screenshots (taken from a Windows 7 OD in French), how to set the environmental variable to link GiD and SAFIR.
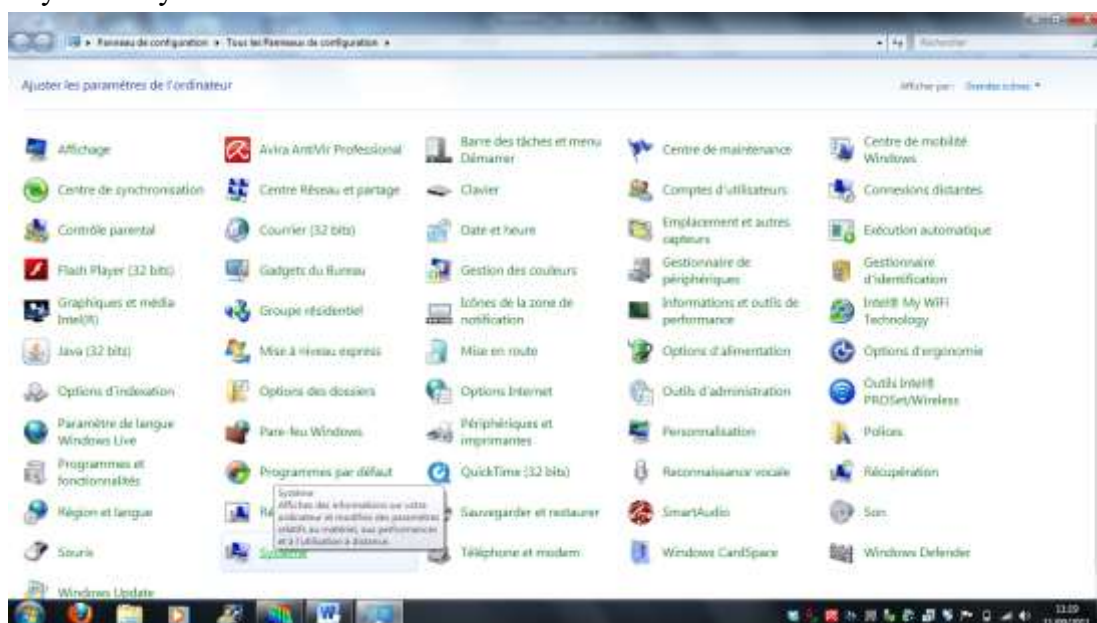
Step 1: The file "safir.exe" has to be put in the folder of your choice. c:\SAFIR\2011\ has been chosen for the screenshots.
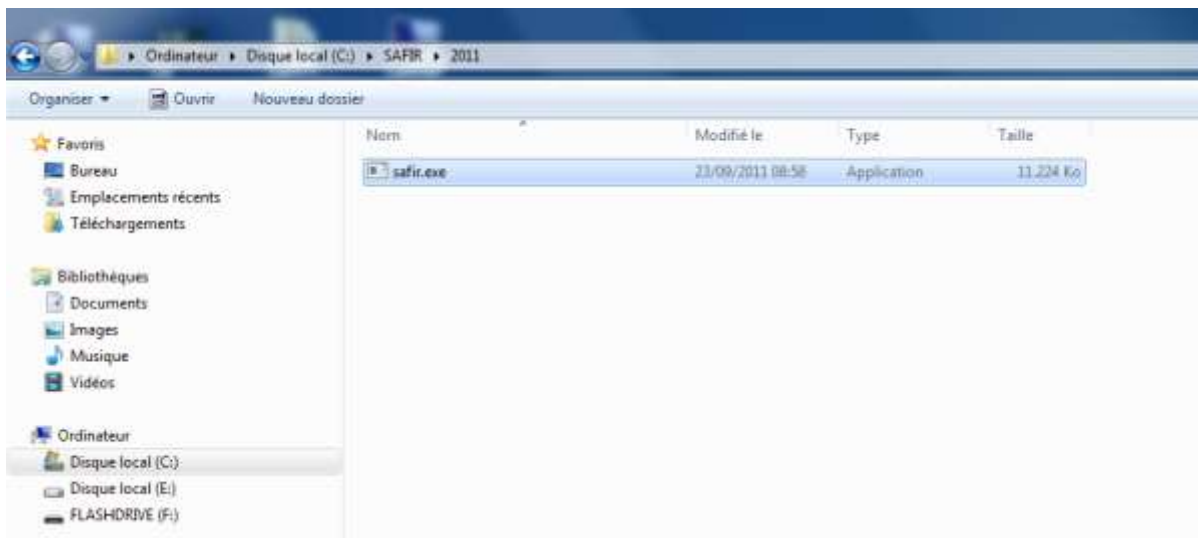
Step 2. Click on the "Windows" symbol located on the bottom left of the screen to open the scrolldown menu and click on "Panneau de configuration/ Control Panel"
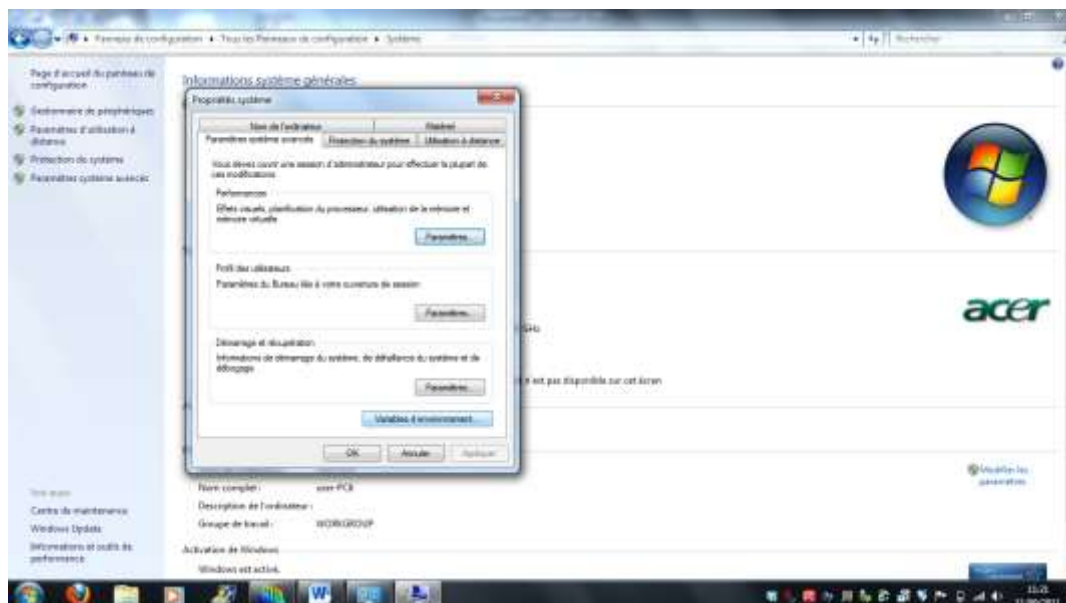
Step 3. In the window « Panneau de configuration / Control Panel», click on "Système/System".

Step 4. Click on « Paramètres systèmes avancés / Advanced»

Step 5. In the Window « Propriétés système / System properties», click on "Variables d'environnements/ Environment variables"

Step 6. Under the window « Variables utilisateur pour xxxx / User variables for xxxx», where xxxx is the user name of the session that is currently running, click on "Nouvelle / New".
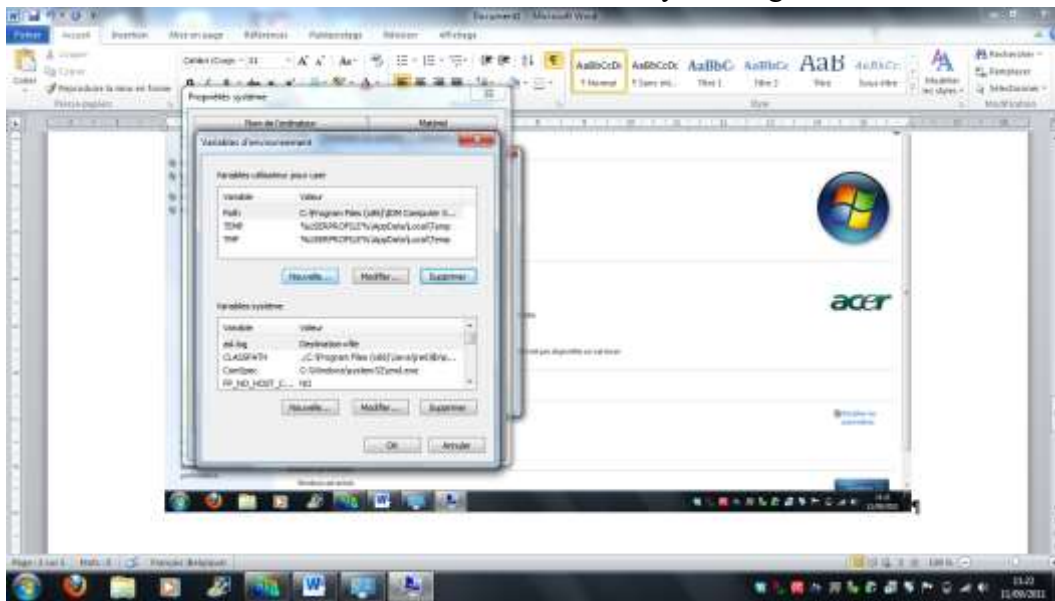
Step 7. In the window « Nouvelle variable utilisateur /New User Variable», enter the string « SAFIR_DIR » and «c:\SAFIR\2011» with the latter being the folder in which the file "safir.exe" has been placed.
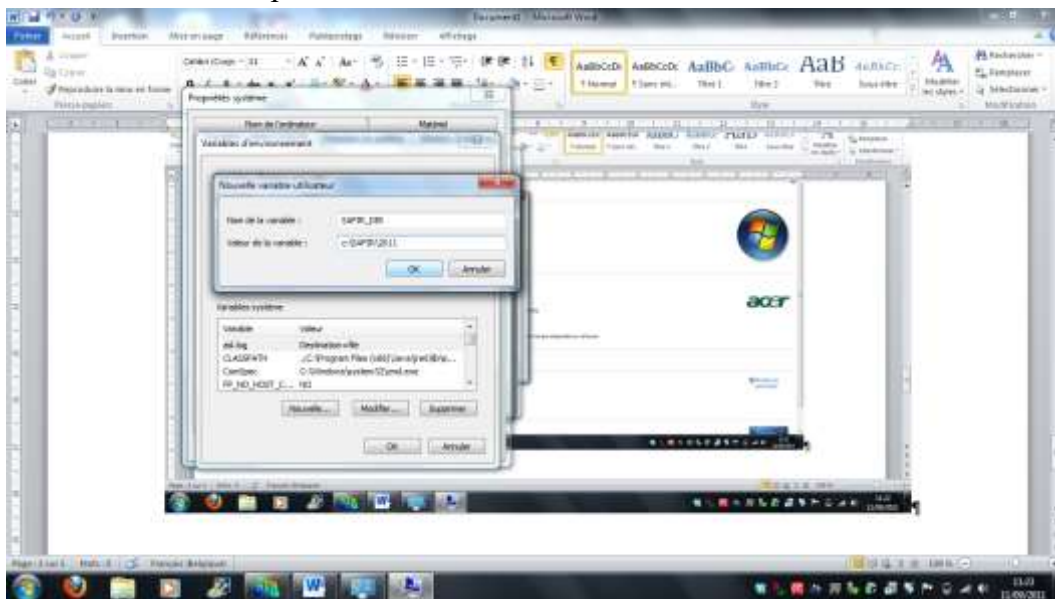
Step 8. The steps 6 and 7 may have to be repeated in the window "Variables système/System Variables", which will make the environment varaible available for all sessions on this computer.

Step 9: Click on OK twice and close the window "Panneau de configuration/ Control Panel".

Step 10. Restart the computer.