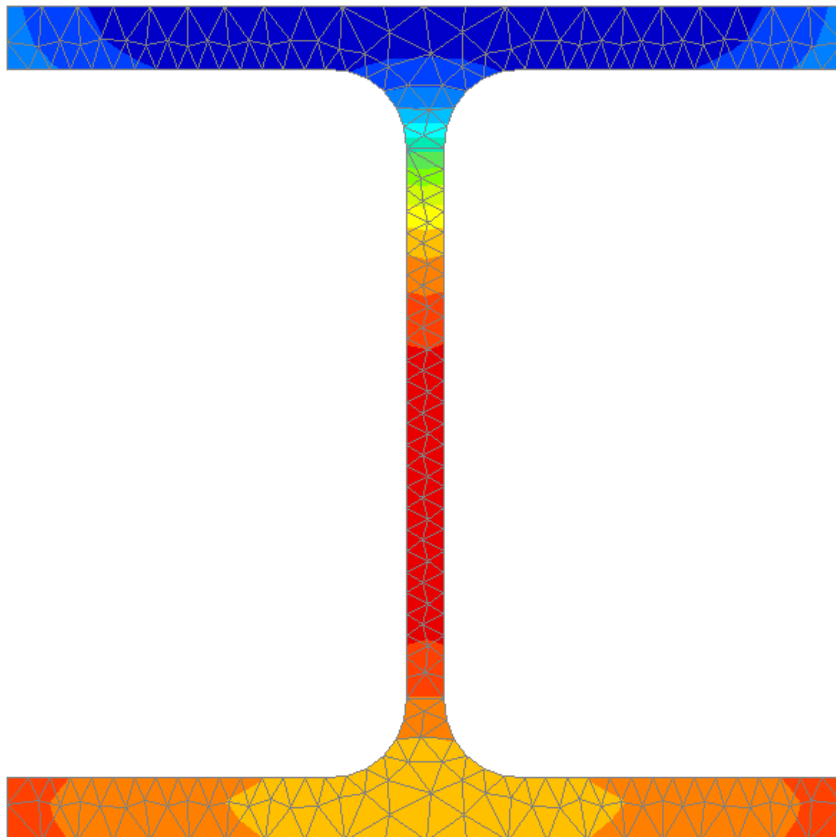


# Example for GiD-SAFIR 2D and 3DThermal Analysis

## Exercise n°2 - HEB200



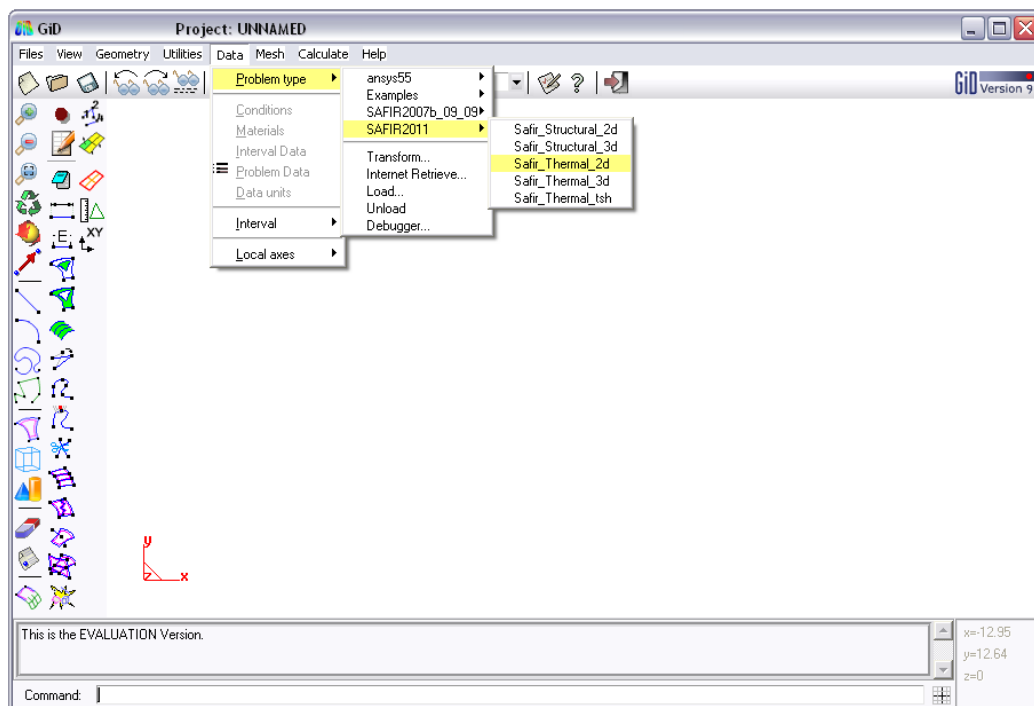
This example creates two HEB200 Sections exposed to ISO fire, one for a 2D calculation and one for a 3D calculation.

## Part 1: HEB200 for 2 D calculation

### 1. Create a project in 2D for Thermal Analysis

From the pull down menu select:

➤ **Data->Problem type->SAFIR2011->Safir\_Thermal\_2d**



To save the project select (or use icons on the left):

➤ **Files->Save**

or  or [Ctrl + s]

⚠ If Caps lock is active on your keyboard, shortcut don't work

Enter a file name, eg.: HEB200

GiD creates a directory with the name HEB200.gid

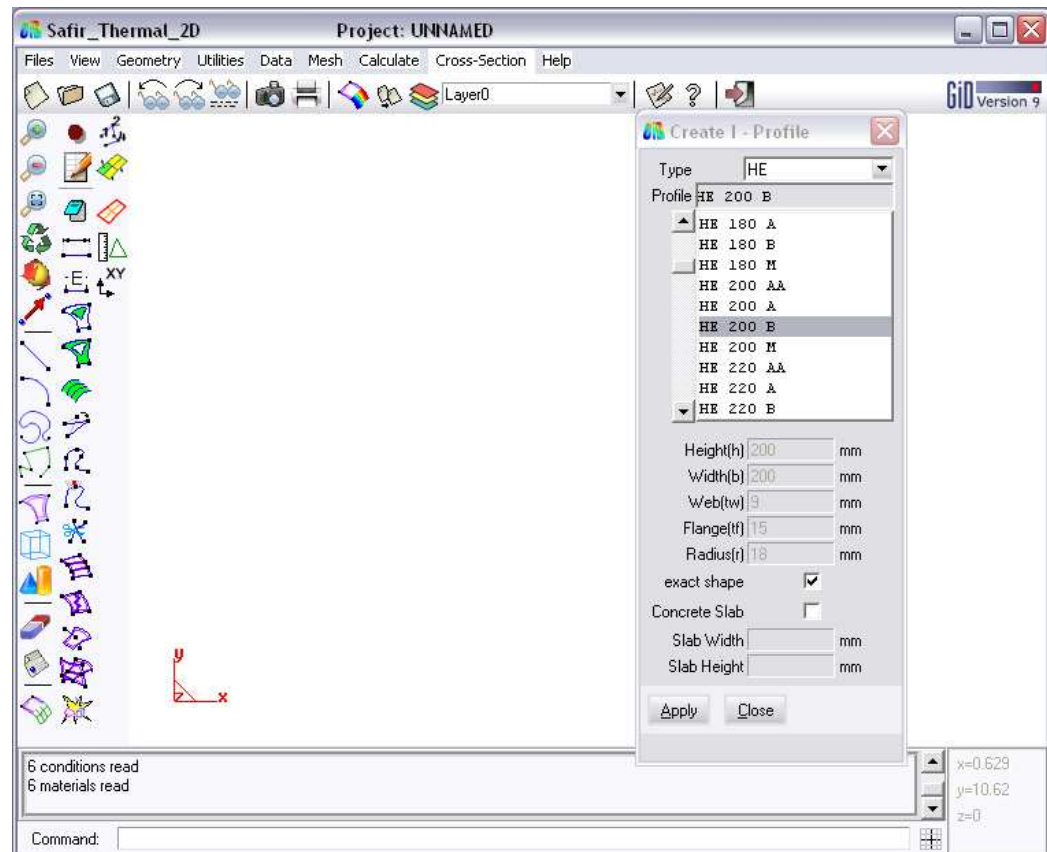
GiD creates a number of system files in this directory.

When you start the SAFIR calculation the Safir . IN, .OUT and .TEM files will be created in this directory.

## 2. Create the geometry in the xy-plane

From the pull down menu select:

➤ *Cross-Section->I-Profile*



Select **HE** as type, **HE 200 B** as Profile and tick **exact shape**

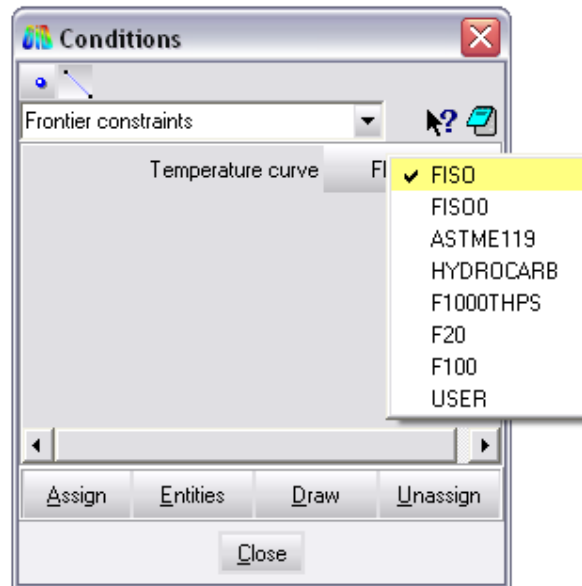
Click on **Apply**

⚠ *GiD-Safir will create a HEB200 profile. The center of this profile will be automatically centered on the 0,0 point of the xy-plan*

### 3. Assign a temperature curve

From the pull down menu select:

➤ *Data->Conditions*



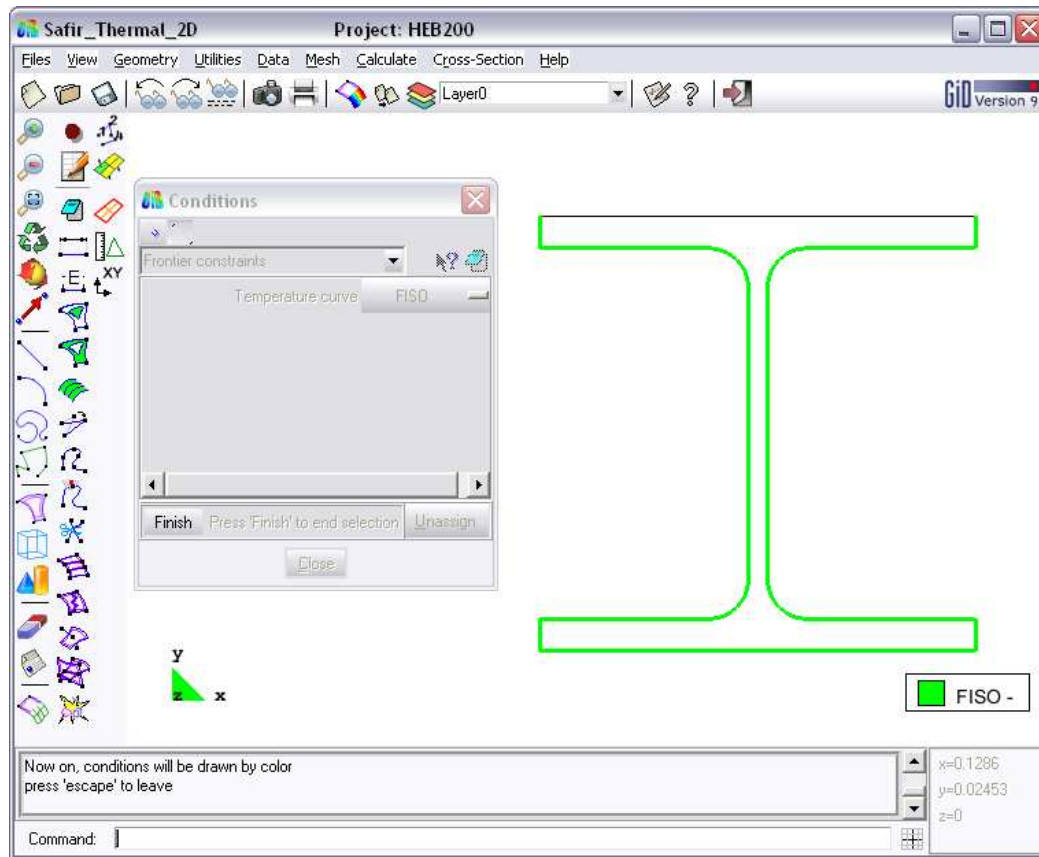
Select:

The  tab

On the first pull down list: *Frontier constraints*

On the Temperature curve pull down list *FISO*

Click on the **Assign** button and assign the ISO fire temperature curve to all profile lines except the upper line as shown below



Press **[Esc]** or click on **Finish** to confirm

Select **DRAW->Colors** in the Conditions dialog box to display the frontier constraints

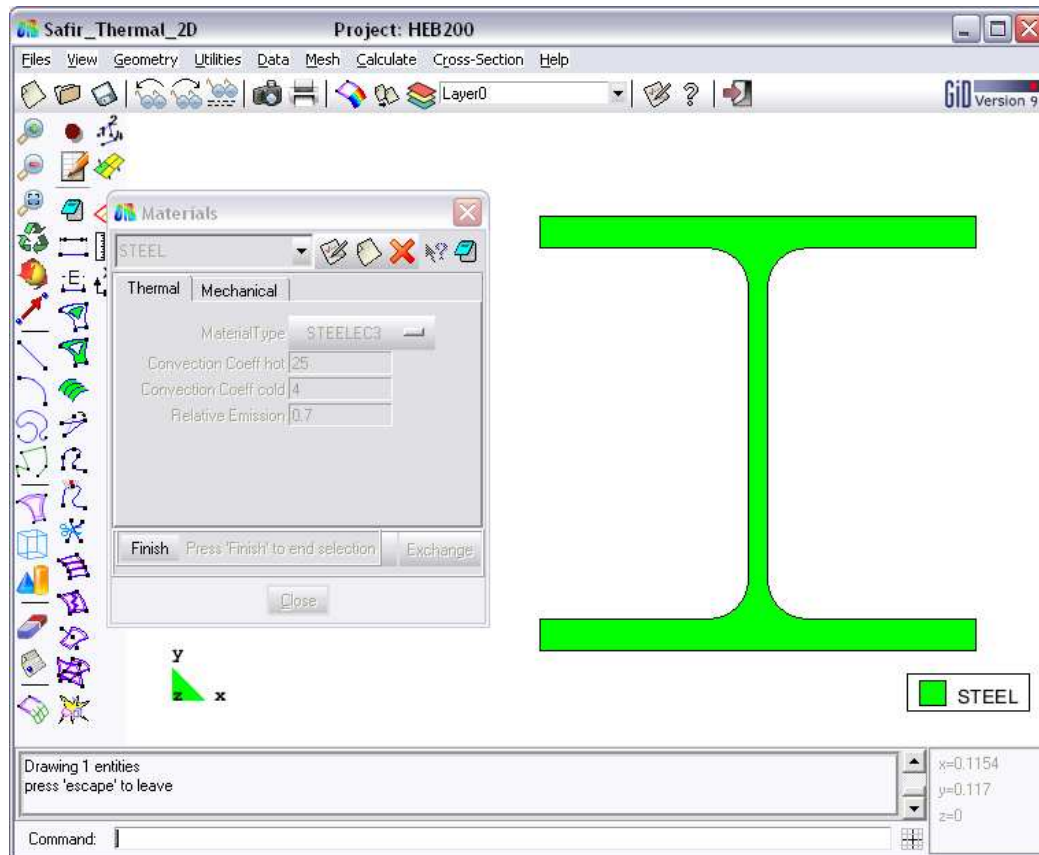
Press **[Esc]** or click on **Finish** to leave this view mode

## 4. Assign Material

From the pull down menu select:

➤ **Data->Materials**

Select **STEEL** from the dialog box pull down list



Then select:

**STEELEC3** as Material Type

A Convection Coeff hot of **25**

A Convection Coeff cold of **4**

A Relative Emission of **0.7**

⚠ *In this case, you don't have to change data in the Mechanical tab. They are needed for Torsion calculation only*

Click on **Assign-> Surfaces** and assign it to the HEB200 surface

Press **[Esc]** or **Finish** to confirm

Select **DRAW->all materials** in the Material dialog box to display Materials

Press **[Esc]** or **Finish** to leave

## 5. Create the mesh

⚠ *The default element type is the Triangle*

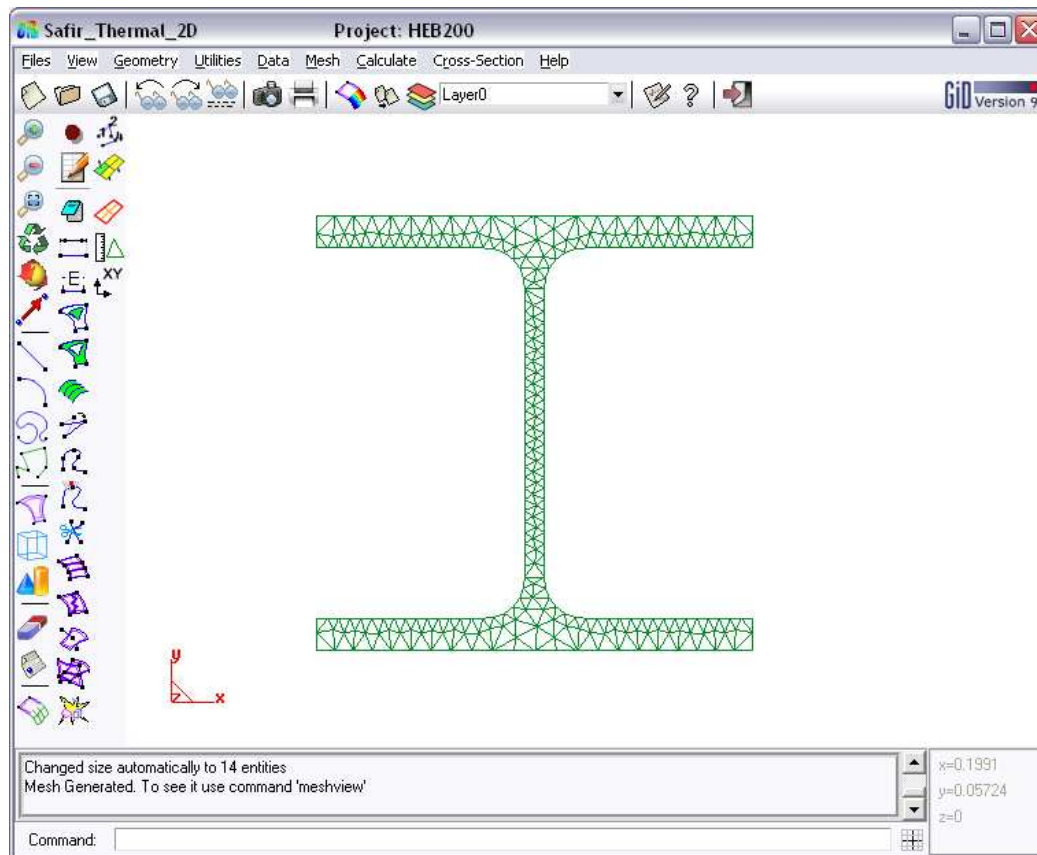
To create meshes select from the pull down menu:

➤ **Mesh->Generate mesh**

*or use [Ctrl + g]*

Enter 0.01 as size of elements to be generated

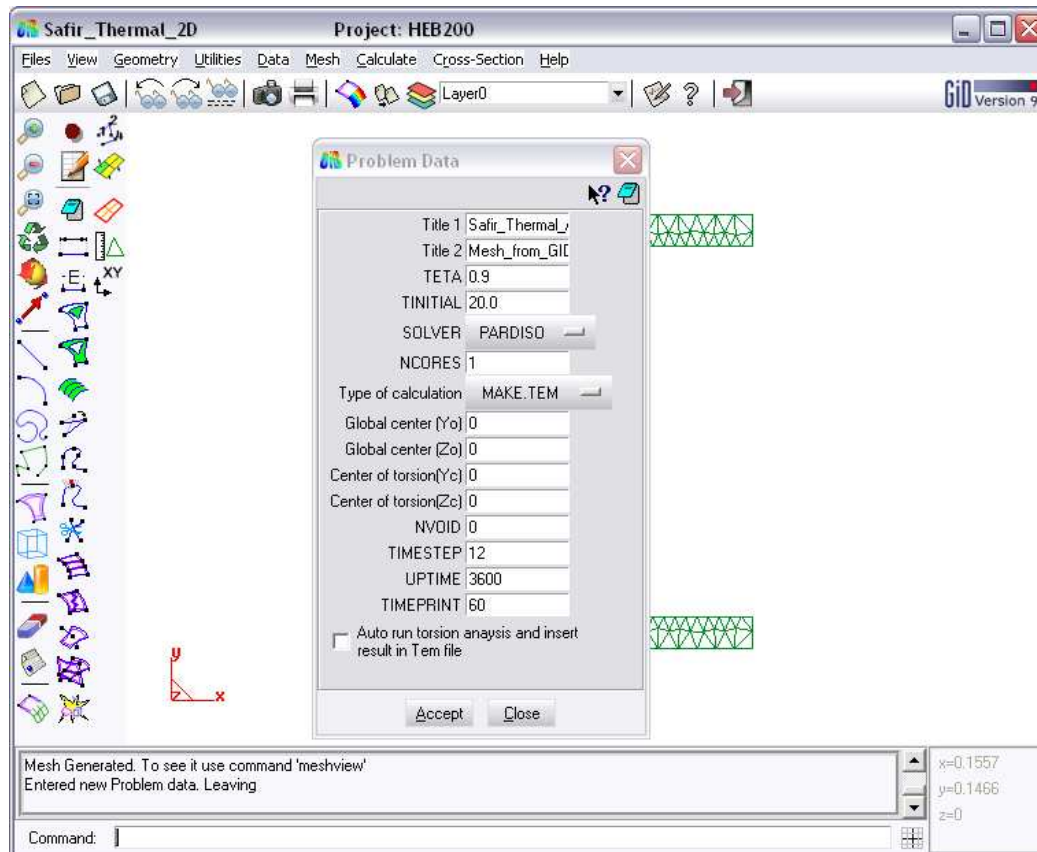
⚠ *A message with the number of nodes and the number of elements will appear. If you are using an evaluation version of GiD, the maximum allowed is 1010 nodes*



## 6. Assign General Data

From the pull down menu select:

► *Data->Problem Data*



In the Problem Data dialog mask enter:

TIMESTEP, UPTIME, TIMEPRINT as needed

Click on the **Accept** data button

⚠ When you click with the right button on one of the variables, GiD will display an online help message. The variables are also described in more detail in the SAFIR reference manual.

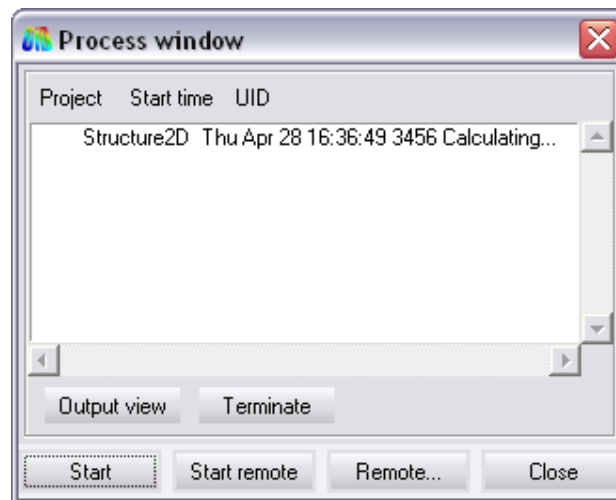


## 7. Start the calculation

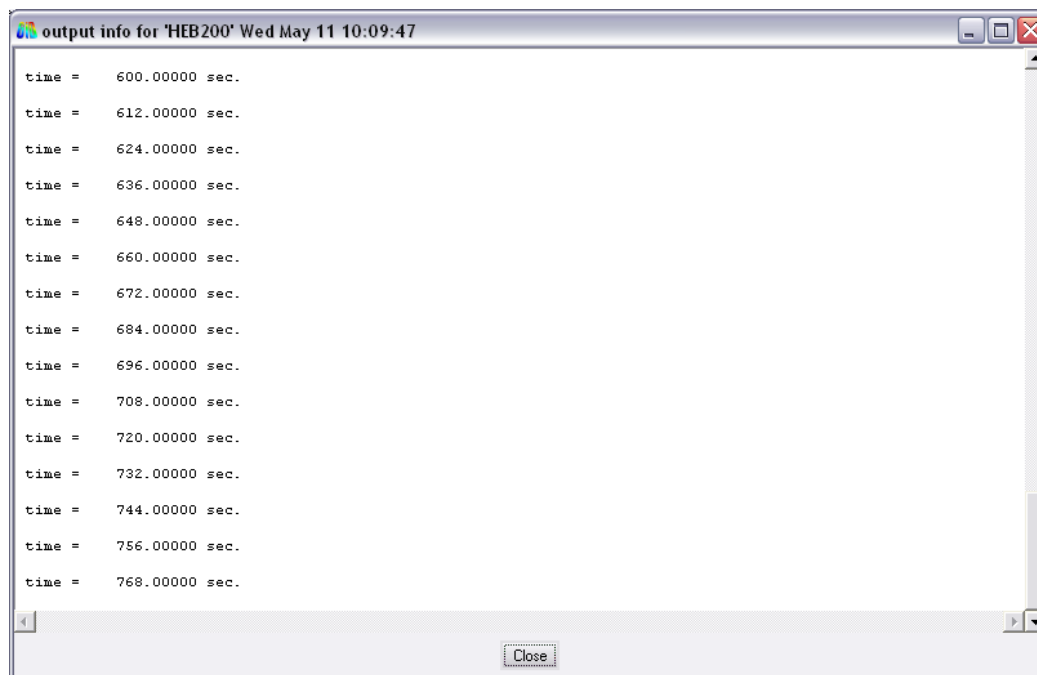
From the pull down menu select:

 *Calculate->Calculate window*

Click the *Start* button




Click the *Output View* button



GiD creates a .IN file in the project directory and starts the calculation.

In the output window you can see the calculation progress from SAFIR and the GiD interface program which generates GiD postprocessor files from the .OUT file.

 *If SAFIR found some errors in the .IN file you will see the error message in this window.*

## Part 2: HEB200 for 3D calculation

### 1. Create a HEB200 for 3D calculation

From the pull down menu select:

➤ **Files-> Save as**

Change the file name (HEB200) to a new one: **HEB200\_3D**

⚠ *If you want to use a .TEM file for a 3D calculation you have to add torsion in the calculation*

### 2. Modify Problem Data

From the pull down menu select:

➤ **Data-> Problem data**

Tick the case **Auto run torsion analysis and insert result in TEM file**

⚠ *With this option, GiD-Safir will directly add the torsion in the TEM file*

### 3. Start the calculation

Do as shown in the part 7 of this document “Start the calculation” (p.9)